OnRobot

USER MANUAL

FOR UR ROBOTS

v1.17.0

Original Instructions

Contents

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 serious injury or death.

1.2. Scope of the Manual

The manual covers the following OnRobot products and their components:

1.2.1. 3FG15

Tool	Version
3FG15	v1

1.2.2. Software and Firmware

1.2.2.1. URCap Software

The manual covers the following software versions:

Software	Version
URCap	v5.17.0

1.2.2.2. Compute Box Software

The manual covers the following Compute Box software version:

Software	Version
Compute Box	v5.17.0

ℹ️ **NOTE:**

When the used Compute Box has lower software/firmware version, update the Compute Box. For detailed instructions, see **7.1.4. Web Client: Update Menu**.

1.3. Naming Convention

1.3.1. 3FG15

The 3FG15 product sometimes will be called TFG as Three-Finger Gripper.

1.3.2. Compute Box/Eye Box

Eye Box and Compute Box are used interchangeably.

1.4. Copyright

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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 and accessories 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 and accessories are normally used in pick-and-place, palletizing, machine tending, assembly, quality testing and inspection and surface finishing applications.

The end-of-arm tooling and the accessories 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.

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*

• *2FGP20 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. Robot Mount

4.1.1. Quick Changer Mounting

4.1.1.1. Quick Changer - Robot Side
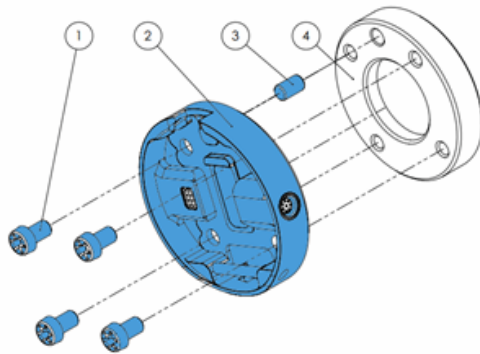
Quick Changer - Robot Side

1. M6x8mm (ISO14580 8.8)
2. Quick Changer (ISO 9409-1-50-4-M6)
3. Dowel pin Ø6x10 (ISO2338 h8)
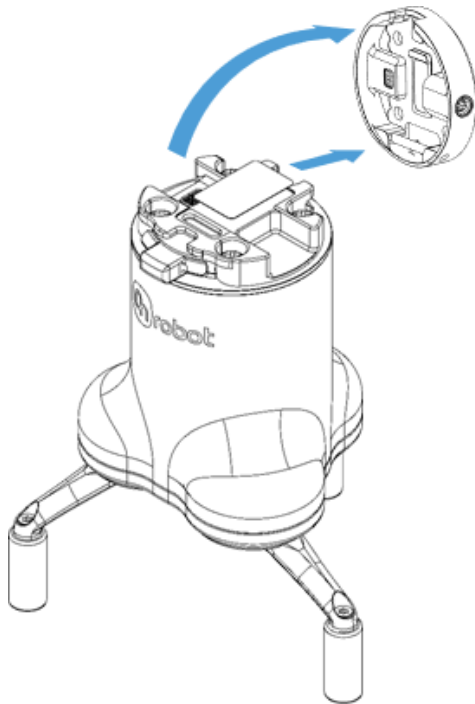4. Adapter/ Robot tool flange (ISO 9409-1-50-4-M6)

Use 10 Nm tightening torque.

4.1.1.2. 3FG15

Tool	QC-R v2	QC-R v2-4.5 A
3FG15	✓	✓

4.1.2. Tools

4.1.2.1. 3FG15

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.
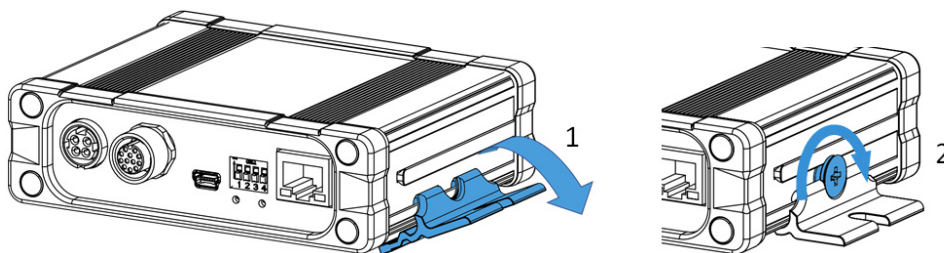
Step 2:

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.

4.2. Compute Box Mount

4.2.1. 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 srew.

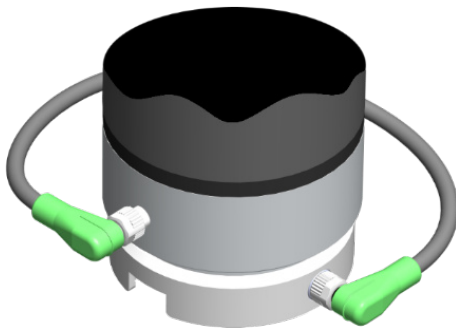## 4.3. Wiring via Tool Connector

⚠️ **DANGER:**

Use only original OnRobot tool data cables.

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

- 2FG7
- 2FGP20
- 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.

ℹ️ **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.
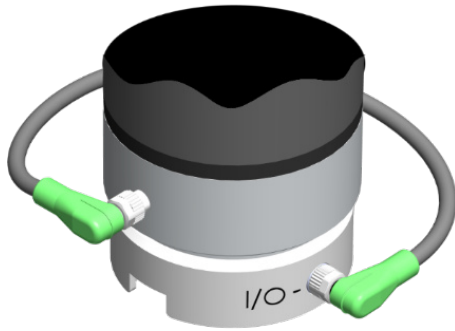
⚠️ **CAUTION:**

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.

Wiring via Tool Connector is finished.

DANGER:

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

5. SW Installation

5.1. Robot Software Setup
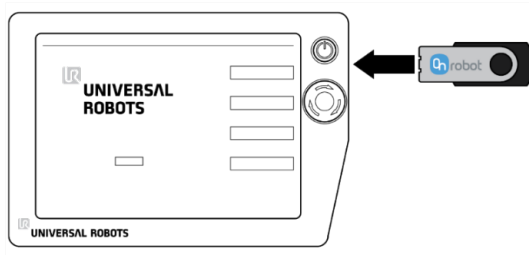
5.1.1. Install URCap

UR CB3

NOTE:

The minimum UR PolyScope version is **3.11**. Please remove all previous OnRobot URCap version(s) before the installation. The controller version must be CB3.1.

For the HEX-E/H QC products the **3.12** is not recommended.

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 **5.5**. Please remove all previous OnRobot URCap version(s) before the installation.

For the HEX-E/H QC products the **5.6** is not recommended, instead please use the **5.7**.

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

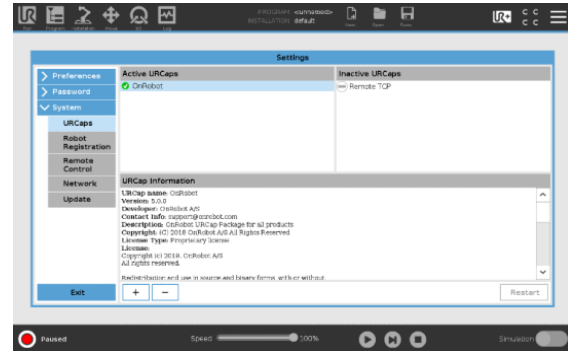

2. Then tap on the ☰ menu (top right corner of the screen), then from the **System** section tap on the **URCaps** menu.

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**.

4. 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.

4. 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.

NOTE:

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

5.1.2. Uninstall Software

UR CB3

1. Select the **Setup Robot** option from the main menu, then the **URCaps** option.

2. Select the OnRobot URCap file.
3. Tap on the - sign.
4. 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.

UR e-Series

1. Tap on the ☰ menu (top right corner of the screen), then from the **System** section tap on the **URCaps** menu.

2. Select the OnRobot URCap file.
3. Tap on the - sign.
4. 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.

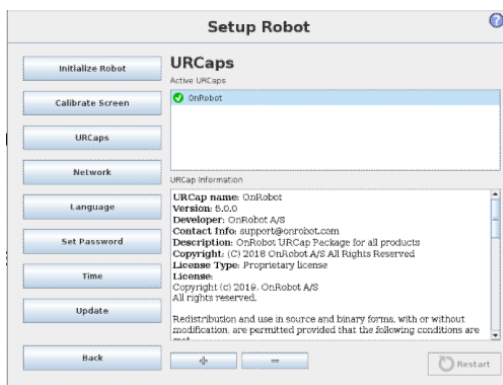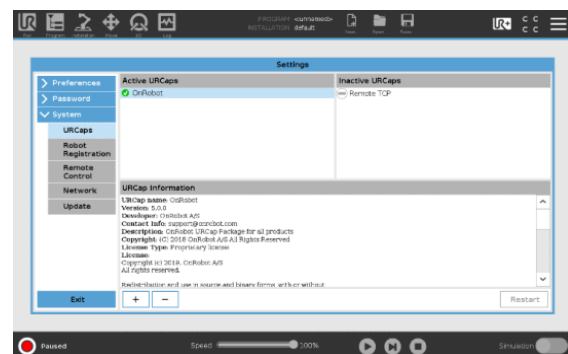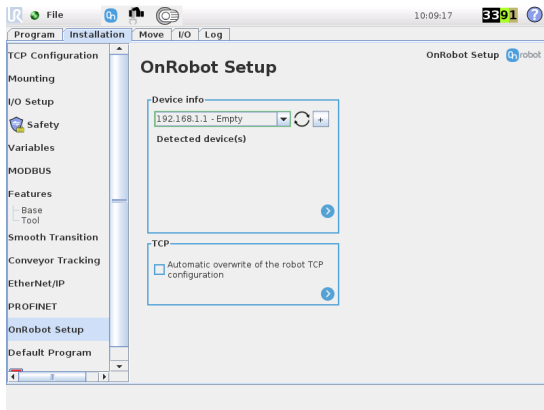5. Initialize the robot.

5. Initialize the robot.

5.1.3. URCap Setup

UR CB3

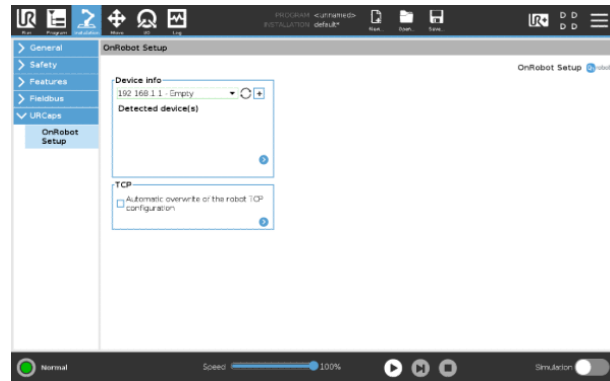Select the **Installation** tab, then select **OnRobot Setup**. The following screen is shown:
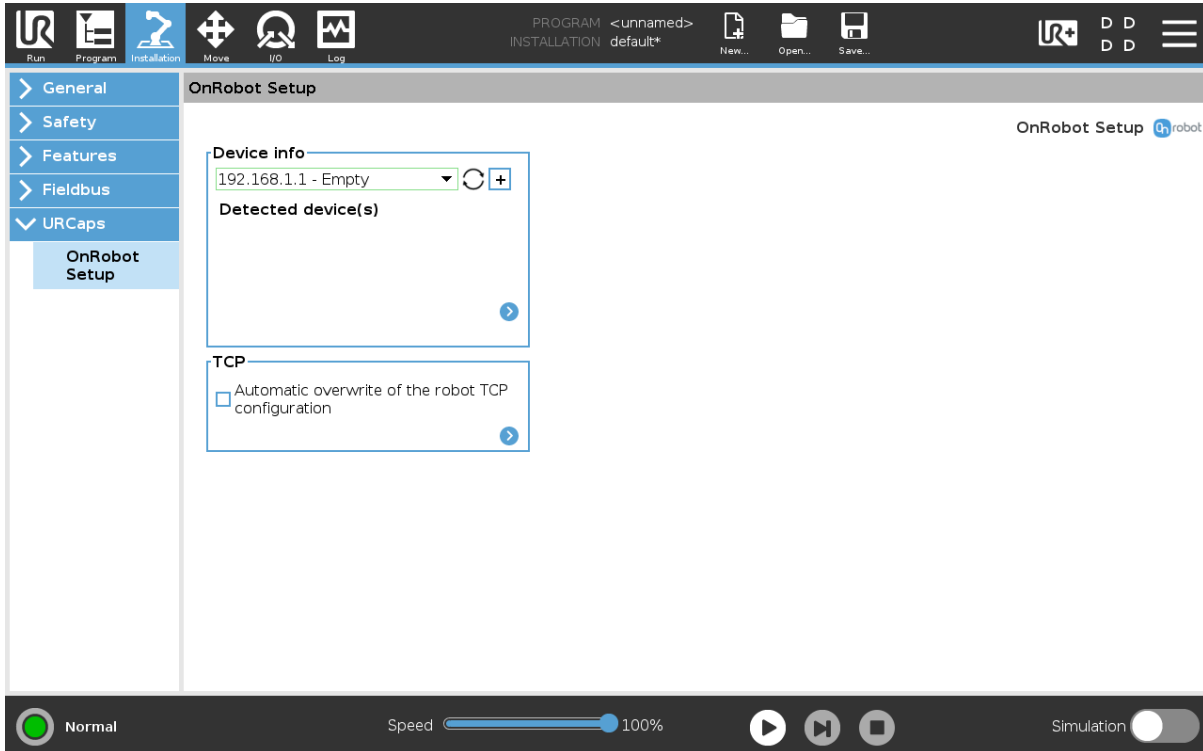

UR e-Series

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:
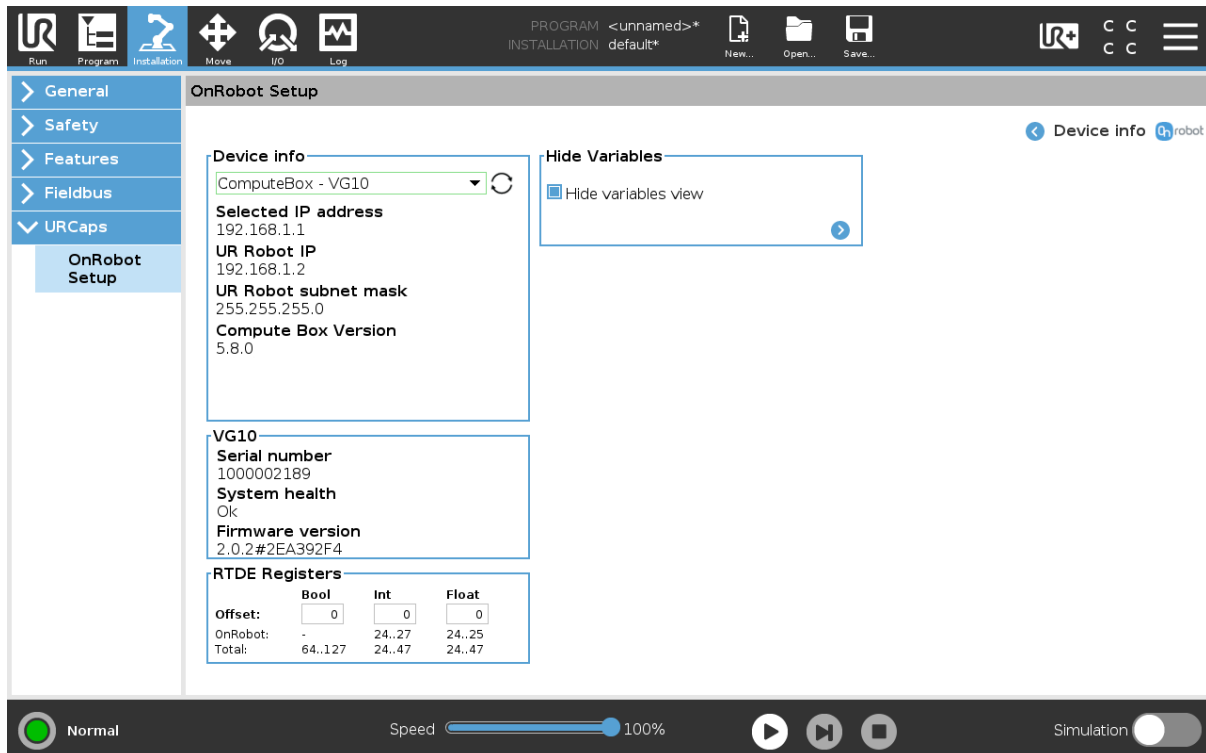
Device info

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.
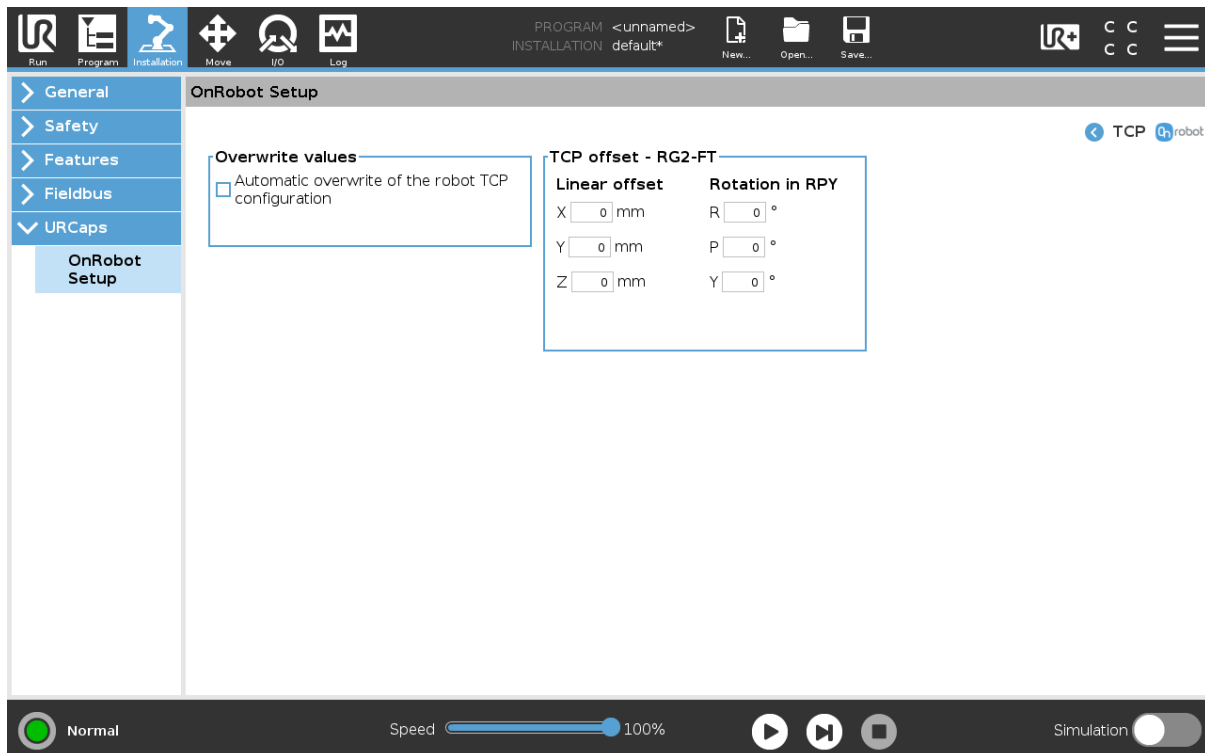
Hide Variables

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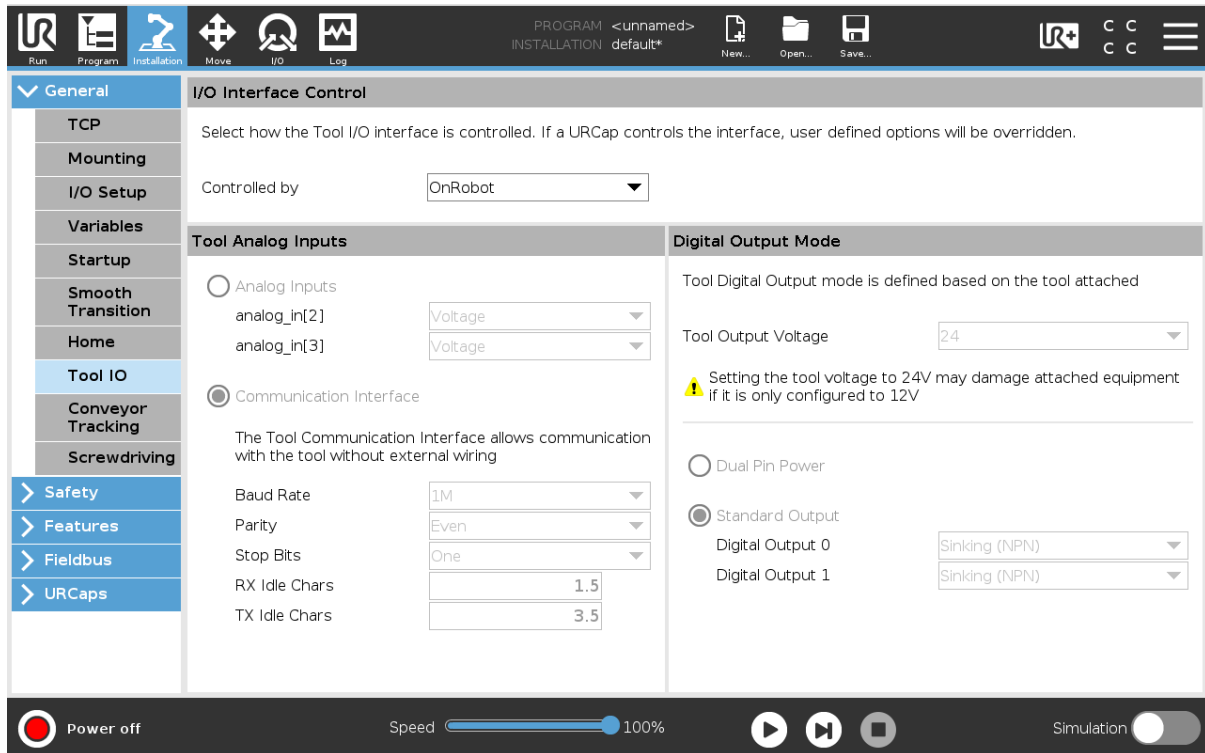
To communicate through the tool connector on CB3 UR robot please set the following configuration:

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.
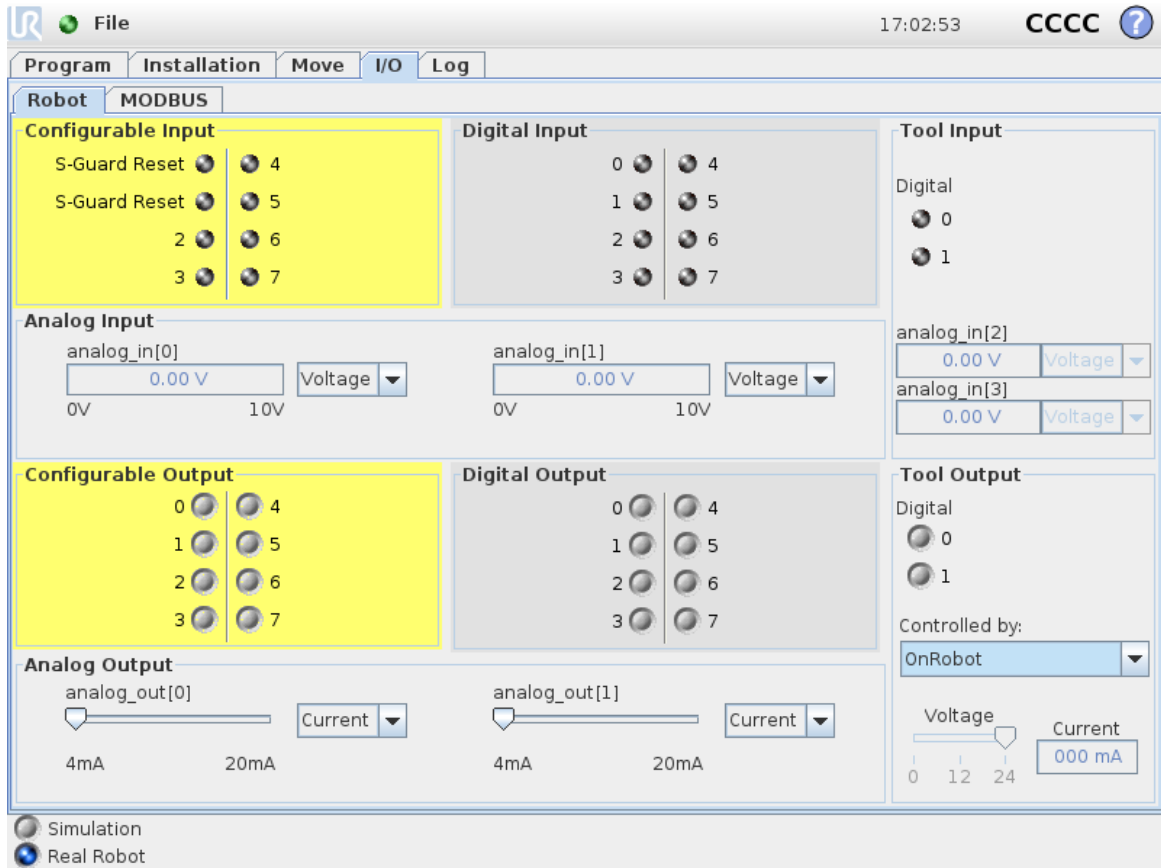
NOTE:

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. 3FG15

The configuration panels for the 3FG15 are shown in the image below:
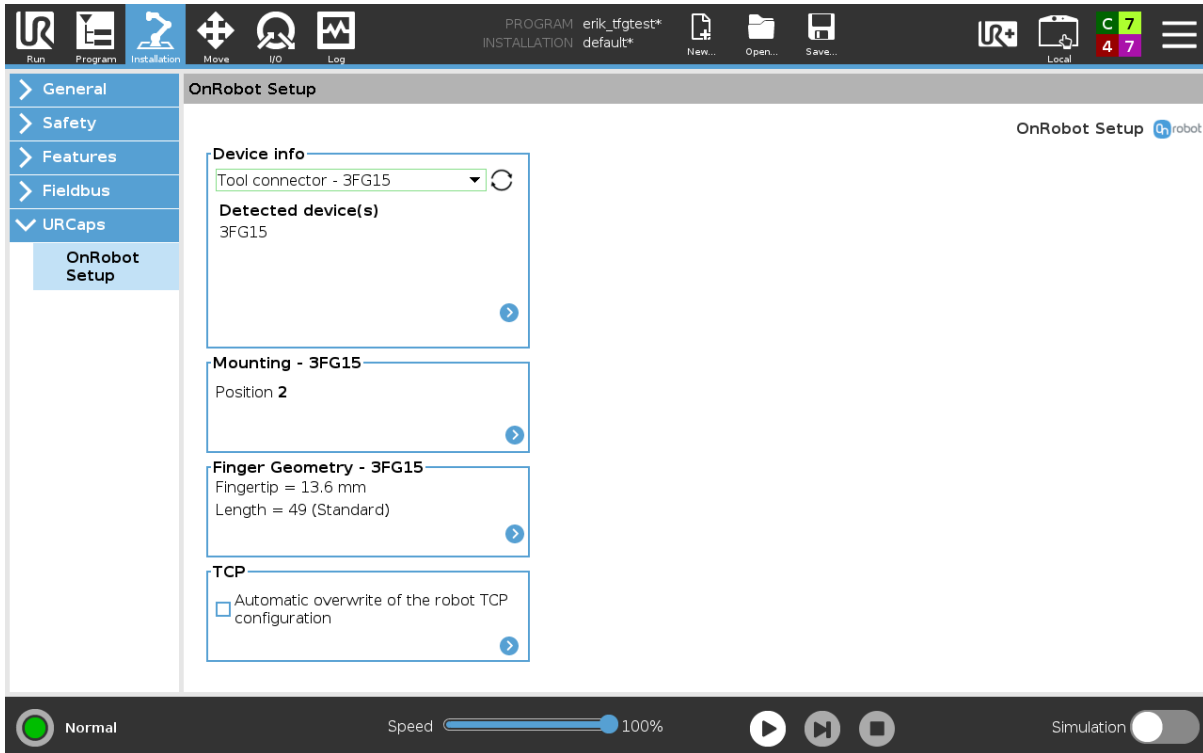
Mounting

In the normal view of the panel, the selected **Position** is shown. Different **Mounting Positions** will allow to achieve different diameters and forces. Find more information in section **Gripping Force** and different **Gripping Diameter**. To select a different Mounting Position press on ➡.
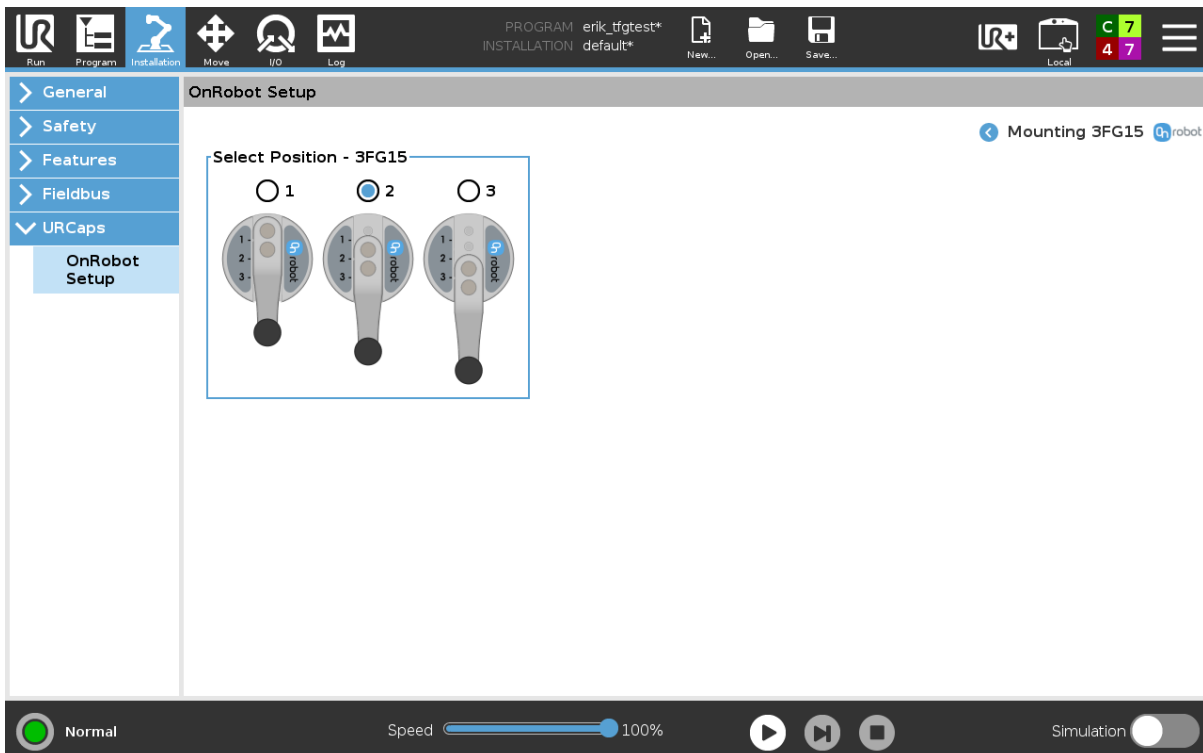
NOTE:

The new selected **Mounting Position** will be saved in the gripper and not in the installation file. Therefore, if the gripper is moved to another robot, the settings will remain the same. However, if another gripper is used in the same robot the settings might need to be reset again.

Finger Geometry

In the normal view of the panel, the selected **Fingertip Diameter** and **Length** are shown. These two settings will, as well as the **Mounting**, allow to achieve different diameters and forces. Find more information in section **Gripping Force** and different **Gripping Diameter**. To select a different **Fingertip Diameter** and/or **Length** press on ⊙.
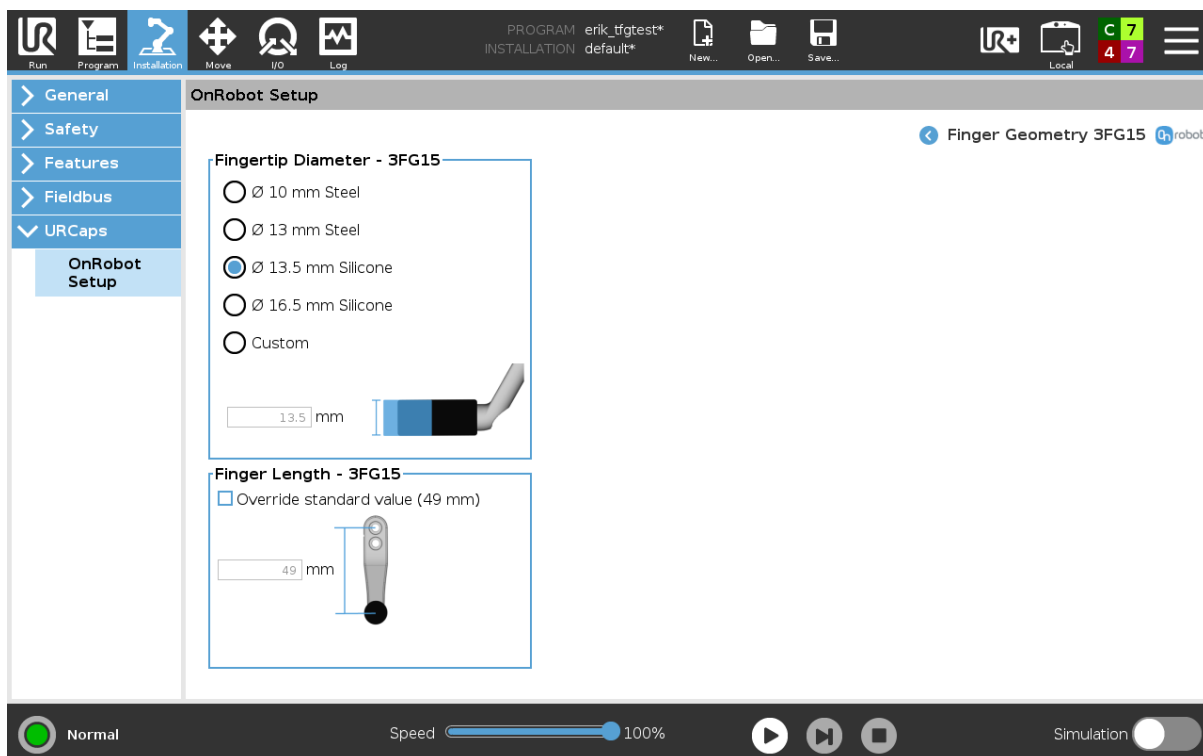
Fingertip Diameter

The 4 different types that are delivered with the gripper can be selected by pressing the radio button. If customized fingertips are made, the custom option can be selected, and the new diameter can be entered in the input field. The selection of a fingertip diameter will automatically change the allowed diameter and force ranges in the commands.

Finger Length

If customized fingers are made, the **Override standard value (49 mm)** can be selected and the **Finger Length** can be entered in the input field. This value will automatically change the allowed diameter and force ranges in the commands.
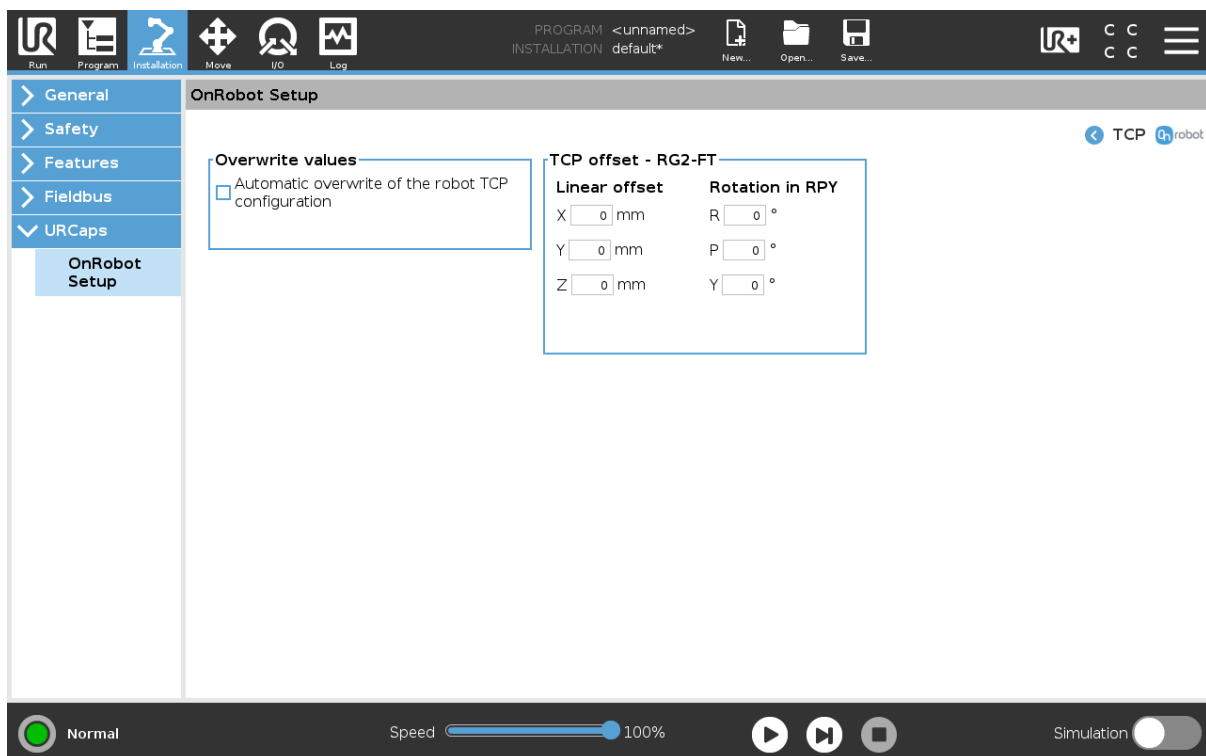
NOTE:

The changes in the **Finger Geometry** settings will be saved in the gripper and not in the installation file. Therefore, if the gripper is moved to another robot, the settings will remain the same. However, if another gripper is used in the same robot the settings might need to be reset again.

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 **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.
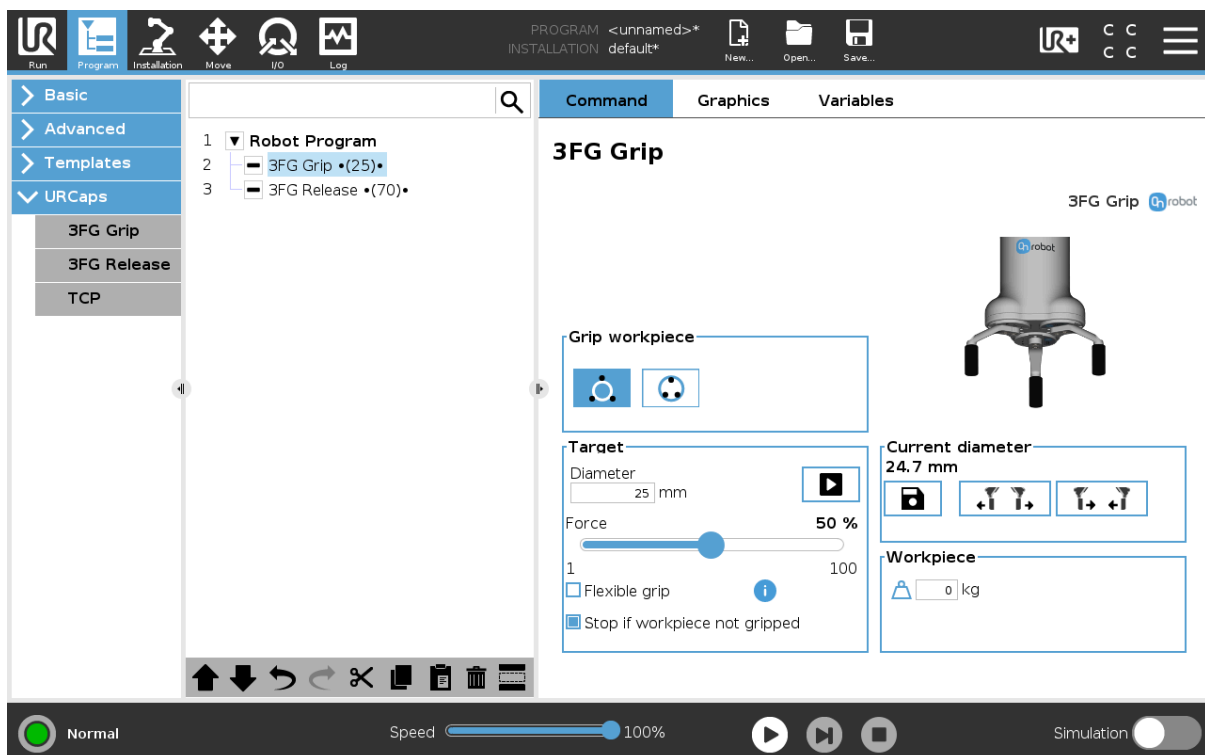
6.1. URCap Commands

URCap commands provide an easy way to program an application.

6.1.1. 3FG15

3FG Grip

When the `3FG Grip` command is executed, the gripper will try to reach the specified target (**Diameter** and **Force**). The different functions are explained below.

The command name in the robot program shows bullets • and a number in parenthesis (X).

- •(x)• Bullets outside the parenthesis means external grip
- (•x•) Bullets inside the parenthesis means internal grip
- The number in parenthesis shows the target diameter

Select device

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

Grip workpiece

 select this if the workpiece will be gripped externally. If this is selected the internal gripper diameter will be shown on the target and current diameter.

 select this if the workpiece will be gripped internally. If this is selected the external gripper diameter will be shown on the target and current diameter.

Target

Diameter: The target gripping diameter can be set by using the Save as **Target** button (recommended) or by typing it in manually. The external gripper diameter will be shown if grip internally is selected and the internal gripper diameter will be show if grip externally is selected.

Force: Set the target gripping Force.

Flexible grip: When selected, the fingers will move from the current diameter towards the target diameter, and do a grip with the desired force. Maximum force is 140 N when 100% is selected, and payload is maximum 8 kg.

Stop if force not applied: If this is enabled and the Target Force is not applied, the robot program will stop.

 When pressed, the gripper will act as if the command is executed.
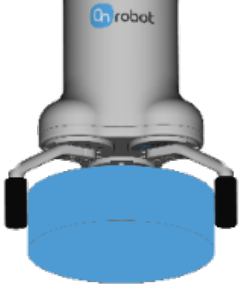
NOTE:

To achieve the Target Force, the Target Diameter must be the workpiece diameter - [1-5] mm for external grip and + [1-5] mm for internal grip depending on the softness of the workpiece. To ensure that target diameter is correct, it is recommended to use the open and close buttons to find the workpiece diameter and use save as target button to save the diameter with ± 3 mm accordingly.

More information about the force can be found on section **Gripping Force**.

In the table below, the different states of the gripper are shown. This helps to ensure that the command is programmed to grip with the specified force.

State	Feedback image
No grip detected	
External grip with target force detected	
Internal grip with target force detected	

Current diameter

The number shows the **Current diameter** value.

[🖫] will set:

- the **Target Diameter** as **Current diameter** – 3 mm if **grip workpiece** [⬡] is selected.

- the **Target Diameter** as **Current diameter** + 3 mm if **grip workpiece** [⬡] is selected.

[←I I→]   [I→←I]   These are open and close hold-to-run buttons.

NOTE:

To enhance **Diameter** precision the **Target Force** is not applied when using these buttons

Workpiece

* 🏋 the workpiece weight can be entered. The URCap software will then perform the calculation of the resulting payload mass considering the gripper, the Quick Changer, and the workpiece mass.

3FG Release

When the `3FG Release` command is executed, the gripper will try to reach the specified **Target Diameter**. The different functions are explained below.
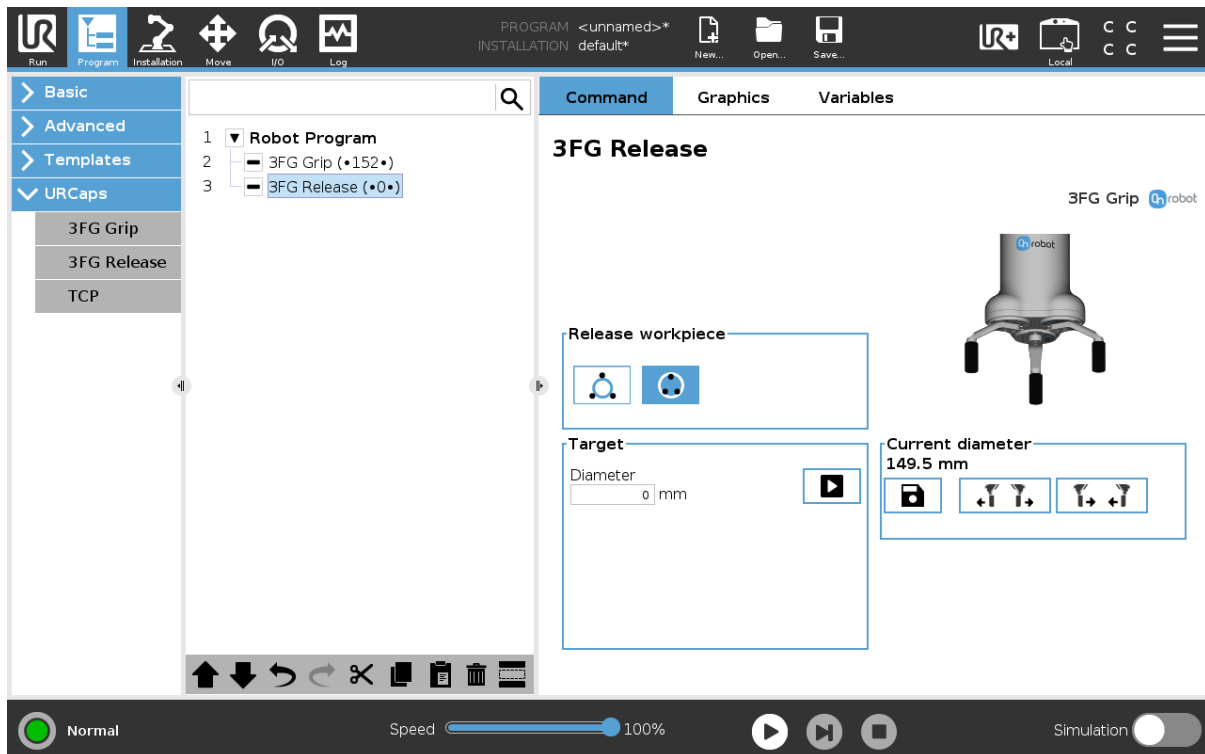
The command name in the robot program shows bullets • and a number in parenthesis (XX).

* •(xx)• Bullets outside the parenthesis means external release
* (•xx•) Bullets inside the parenthesis means internal release
* The number in parenthesis shows the target diameter

Select device

When two grippers are used, these buttons will select which one of the two grippers performs the action. The active button will have a blue background.

Release workpiece

 select this if the workpiece will be released externally

 select this if the workpiece will be released internally

Target

Diameter: The target release diameter can be set by using the ⊟ Save as Target button (recommended) or by typing it in manually. The external gripper diameter will be shown if release internally is selected and the internal gripper diameter will be show if release externally is selected.

▶ When pressed, the gripper will act as if the command is executed.

Current diameter

The number shows the **Current diameter** value.

⊟ will set the **Current diameter** as target diameter.

These are open and close hold-to-run buttons.

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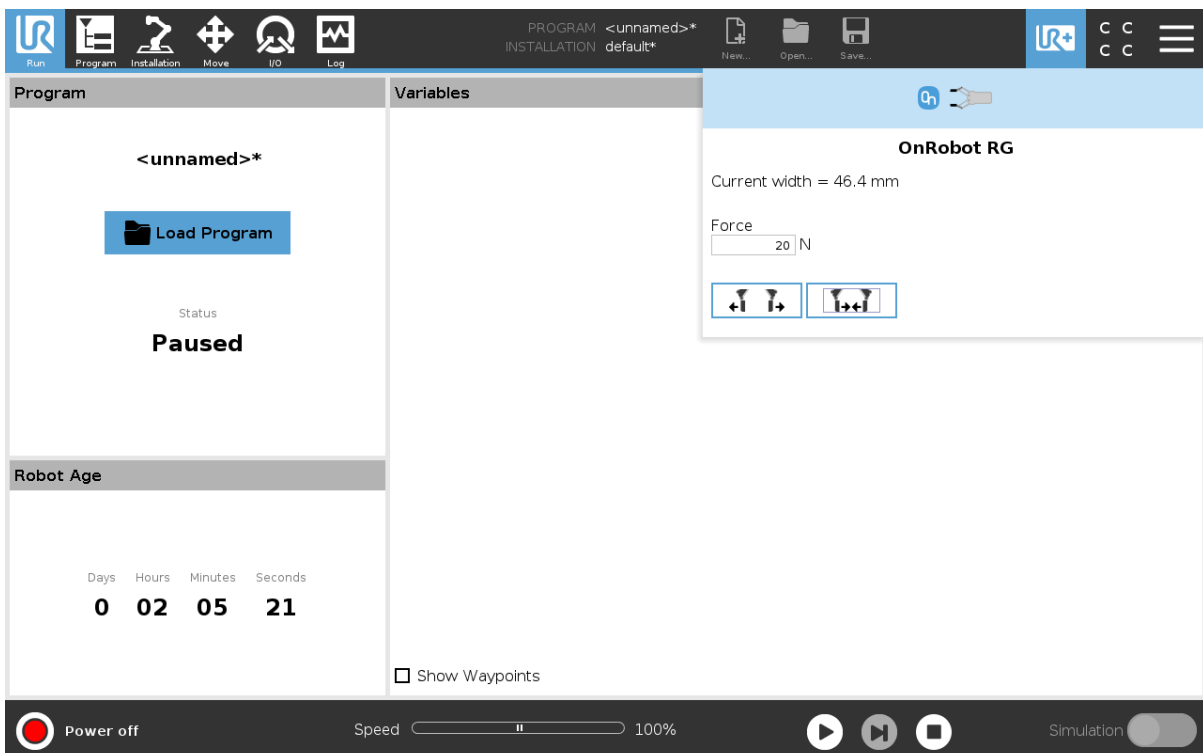
The Toolbar makes it simple to operate the tools while you are programming or during runtime.

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.
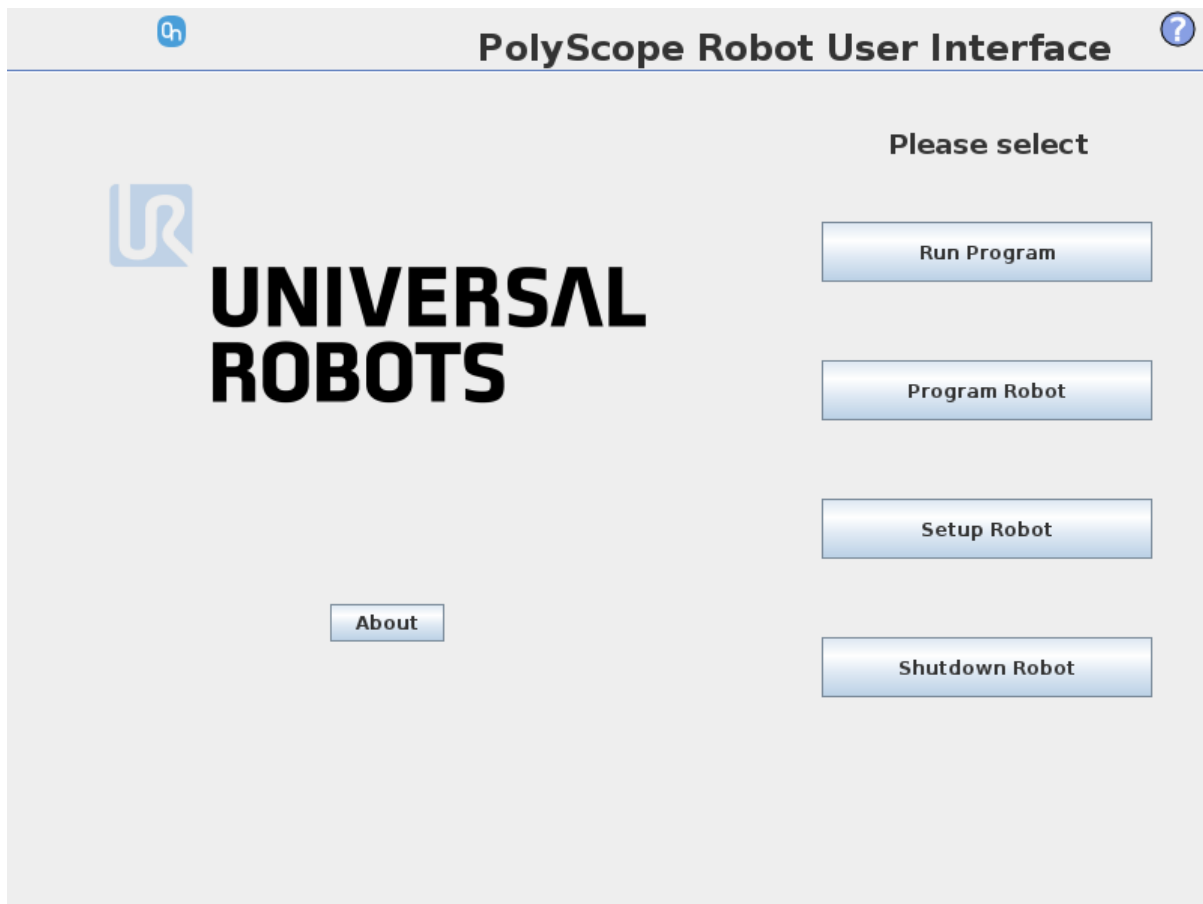
To enable/disable the toolbar, press on the OnRobot logo on the top right corner and check/uncheck the **Enable toolbar** checkbox.
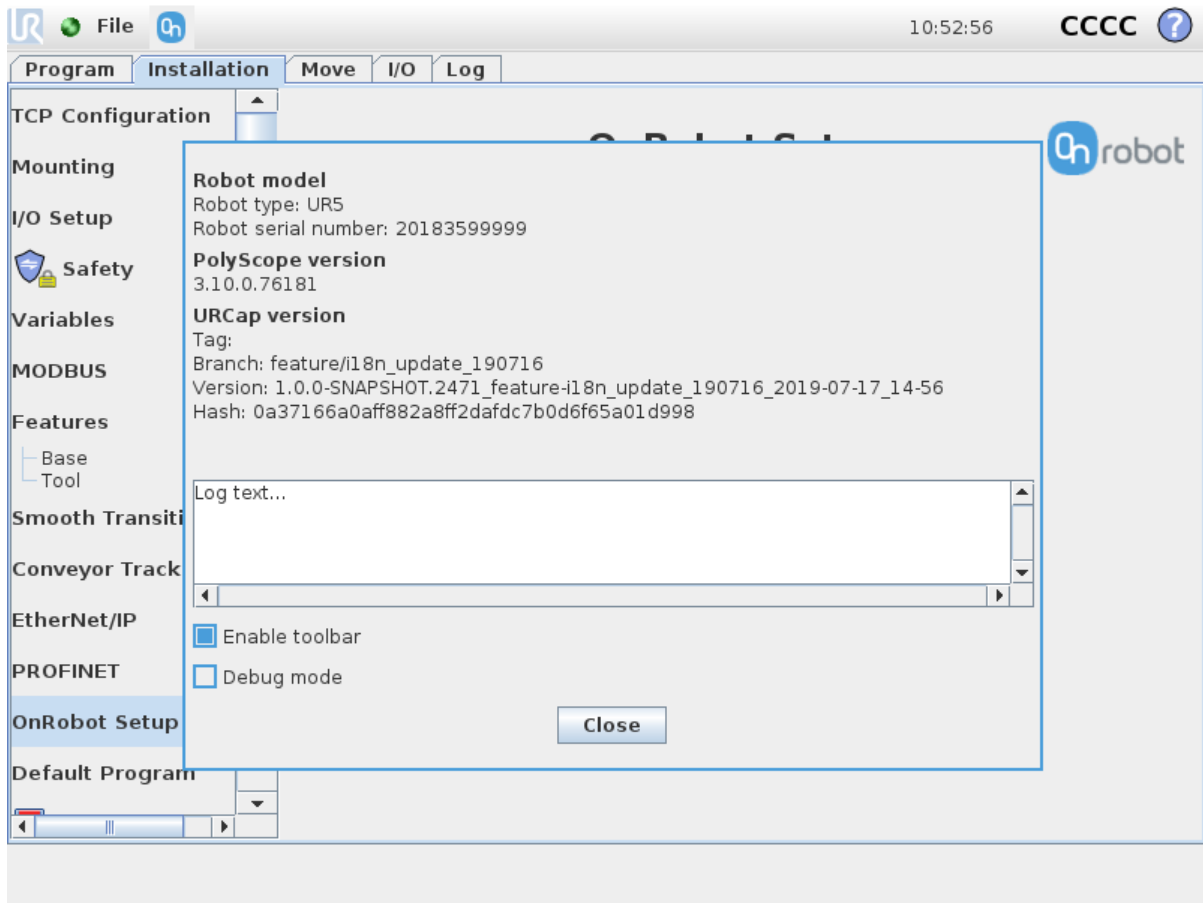
6.2.1. 3FG15

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 3FG15 gripper is shown below.
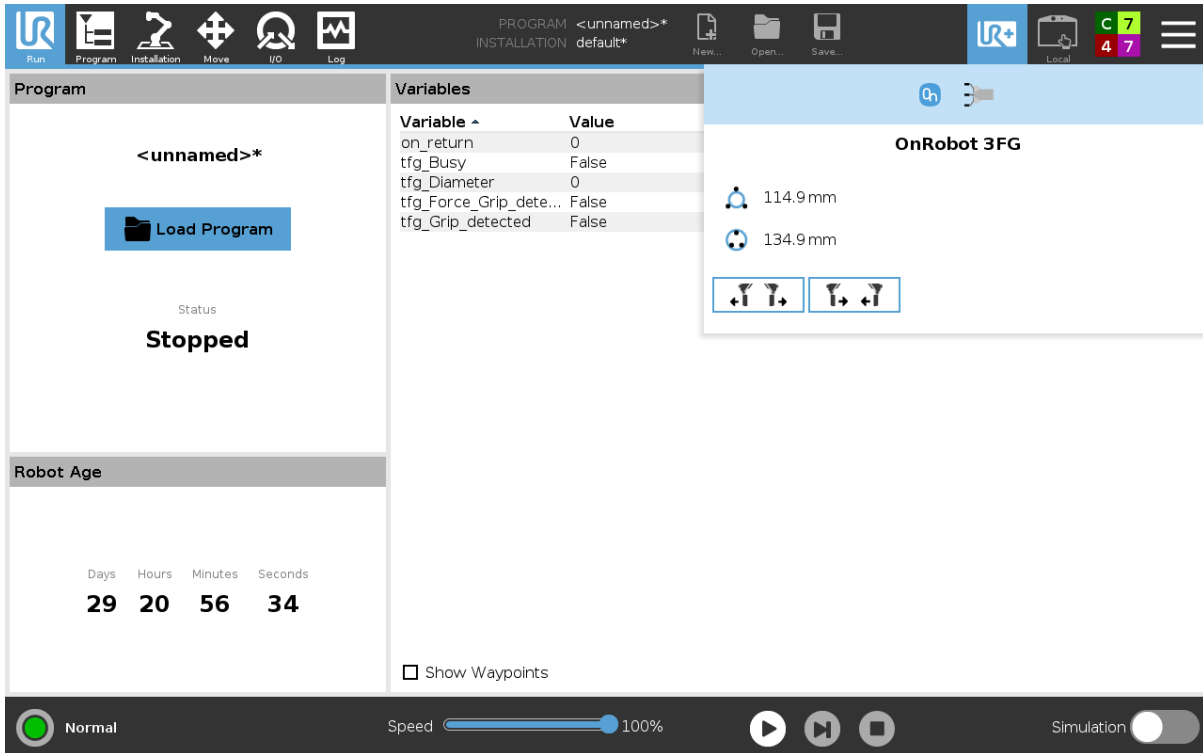
Current internal diameter.

Current external diameter.

These are open and close hold-to-run buttons.

6.3. URScript Commands

URScript commands can be used alongside other scripts.

6.3.1. 3FG15

When the OnRobot URCap is enabled, there will be several 3FG script functions available:

```
tfg_grip(diameter, force, external_grip= True, stop_if_no_force =true,
tool_index=0, blocking=True)
```

diameter: The diameter that the gripper will open to. [mm]

force: The force that the gripper will try to reach. [N]

external_grip: If true, the internal gripper diameter to do an external grip will be used. If false, the external gripper diameter to do an internal grip will be used.

stop_if_no_force =true: If true, the robot program will stop if the force is not reached.

tool_index: Select what gripper performs the action. 0 only one gripper connected, 1 for gripper in position 1 and 2 for gripper position 2. Positions of the dual quick changer.

blocking=True: The function waits for the gripper to finish the grip command.

```
tfg_flexible_grip(diameter, force, external_grip=True,
stop_if_no_force=True, tool_index=0, blocking=True)
```

The description of the parameters are the same as for the tfg_grip script function.

```
tfg_release(diameter,  external_release= True, tool_index=0,
select_releasing=0, blocking=True)
```

diameter: The diameter that the gripper will open to. [mm]

external_release: If true, the internal gripper diameter to do an external release will be used. If false, the external gripper diameter to do an internal release will be used.

tool_index: Select what gripper performs the action. 0 only one gripper connected, 1 for gripper in position 1 and 2 for gripper position 2. Positions of the dual quick changer.

blocking=True: The function waits for the gripper to finish the grip command.

For example, a relative movement for quickly releasing a workpiece can be done as follows:

If only one gripper is connected, use:

```
tfg_release(3fg_Diameter+5, 3fg_index_get())
```

This will open the Gripper 5mm with the default speed.

If two 3FG grippers are attached, use:

For primary:

```
tfg_release (3fg_Diameter_primary+5, 1)
```

For secondary:

```
tfg_release (3fg_Diameter_primary+5, 2)
```

6.4. Feedback Variables

6.4.1. 3FG15

Feedback Variable	Unit	Description
on_return		The return value for the OnRobot commands
tfg_Busy	True/false	Whether the gripper is active or not
tfg_Diameter	[mm]	Width between the fingers of the Gripper
tfg_Grip_detected	True/False	True if Gripper has detected a workpiece

Feedback Variable	Unit	Description
tfg_Force_Grip_detected	True/False	True if Gripper has done a grip with the target force

7. Additional Software Options

7.1. Compute Box/Eye Box

7.1.1. 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 **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.
- To find the IP address of the Compute Box, open the OnRobot Discovery Tool.
- 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:
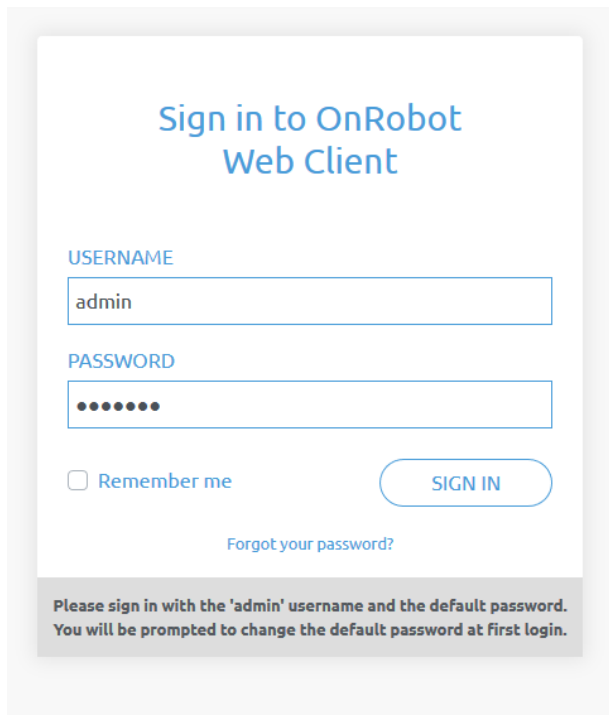
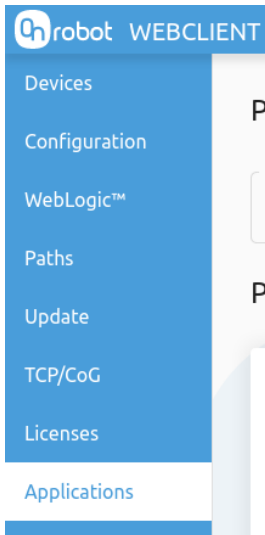The factory default administrator login is:

Username: admin
Password: OnRobot

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

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
- **Licenses** - Activate the licenses for a software product
- **Applications** - Create and manage applications

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.

7.1.2. Web Client: Devices Menu

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

Please select from the detected device(s):

Compute Box	HEX-E/H QC	RG2
SELECT	SELECT	SELECT

7.1.2.1. 3FG15

The state of the gripper could be:

- **Busy** - the gripper is in motion
- **Grip detected** - the gripper has detected a workpiece
- **Force grip detected** - the gripper has applied the target force to a workpiece. This also activates a break.

The gripper can be controlled in two modes:

- **Move** mode - This is the easiest way to move the gripper, and this should be used to release a part and open the gripper.
- **Grip** mode - This should be used to properly grip a part with a given target force. If the part is properly gripped (target force is reached) the break will engage to make sure the part will not be dropped in case of a power loss.

In **Move** mode:

The gripper can be controlled by adjusting the **Target raw diameter** slider. The actual values of the fingers are shown by the **Current raw diameter**. The raw diameter is without the fingertip offset.

In **Grip** mode:

First set how to grip the part:

- Externally or
- Internally

To do a normal grip, set the **Target diameter** and **Target force** and click on the **Grip** button. There are two ways how the target diameter can be given:

- Enter manually - make sure to add 3mm to the part diameter if it is gripped internally and subtract 3mm if it is gripped externally.
- Use the **Calculate target** button:

  Move the fingers with the slider to touch the part and activate the **Grip detected** (open fully for an internal grip or close fully for an external grip).

  Based on whether it will be external or internal the **Current calculated target** (diameter) for the grip is shown. The fingertip offset is either added or subtracted to compensate for the set fingertip.

Grip type	Current calculated target value
External grip	**Current raw diameter** - **Fingertip offset** - **3 mm**
Internal grip	**Current raw diameter** + **Fingertip offset** + **3 mm**

  Click on the **Calculate target** button to load the calculated value to the **Target diameter**.

To do a Flexible grip on a part, set the **Target diameter** and **Target force** and click on the **Flexible grip** button.

If any of the above grip type was successful, the **Force grip detected** signal should be activated and the engaged brake should make a clicking sound.

During the gripping the motion of the finger can be terminated by clicking on the **Stop** button.

To release the part from a gripped status, move the gripper:

- Outward in case of an external grip
- Inward in case of an internal grip.

The default finger setting can be changed on the **Settings** tab:
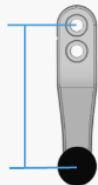
- **Select finger position** - Select the mounted finger position and **Save**.
- **Set finger length** - If customized fingers are needed, the checkbox can be enabled, and the new finger length can be entered.
- **Set fingertip offset** - The 4 different types that are delivered with the gripper can be selected by pressing the radio button. If customized fingertips are made, the custom option can be selected.

Saving any of these 3 settings will automatically apply the changes. Different finger positions, fingertip diameters and finger lengths will allow to achieve different diameters and forces. Find more information in sections **Gripping Force** and **Gripping Diameter**.

7.1.3. Web Client: Configuration Menu

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).

For information on the **Robot settings** and the **WebLytics settings**, see the WebLytics Manual.

7.1.4. Web Client: Update Menu

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

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

Download the latest `.cbu` file from the **Downloads** menu on the website.

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.
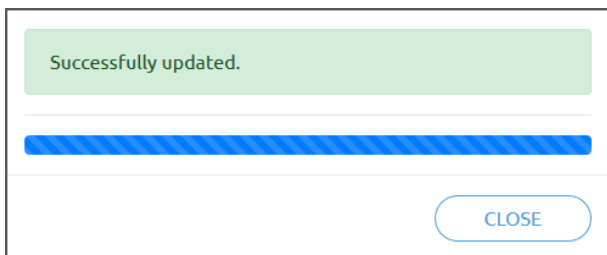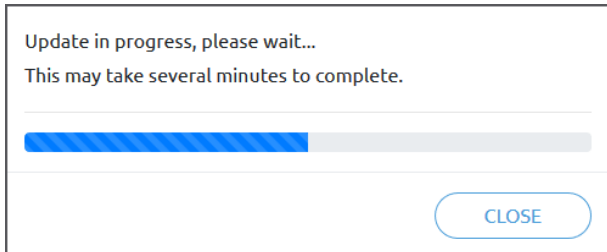
7.1.5. Web Client: TCP/CoG

Use the TCP/CoG calculator to calculate the TCP (Tool Center Point) and CoG (Center of Gravity) values for your OnRobot product combination.
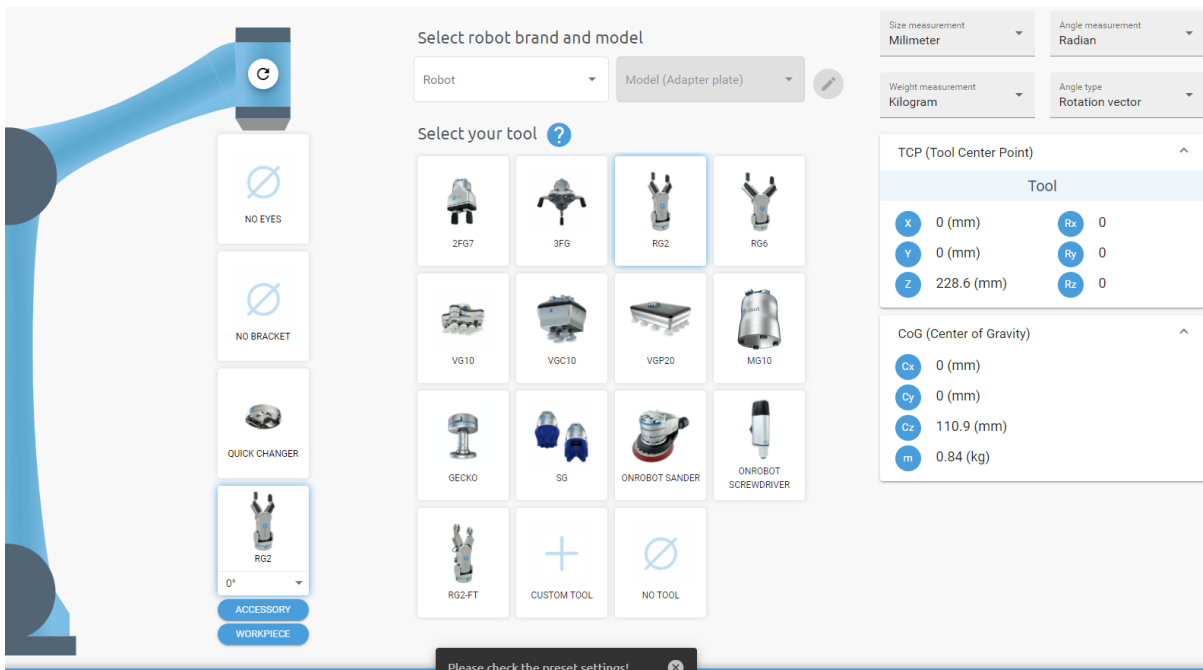
The TCP/CoG calculator will show the automatically detected settings.

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.

7.1.6. Web Client: Account Settings

This menu can be used to:

- See the currently sign-id user
- Go to **Account settings**
- Sign-out
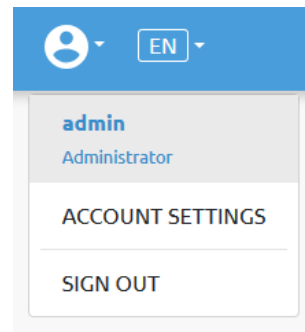
Account settings:
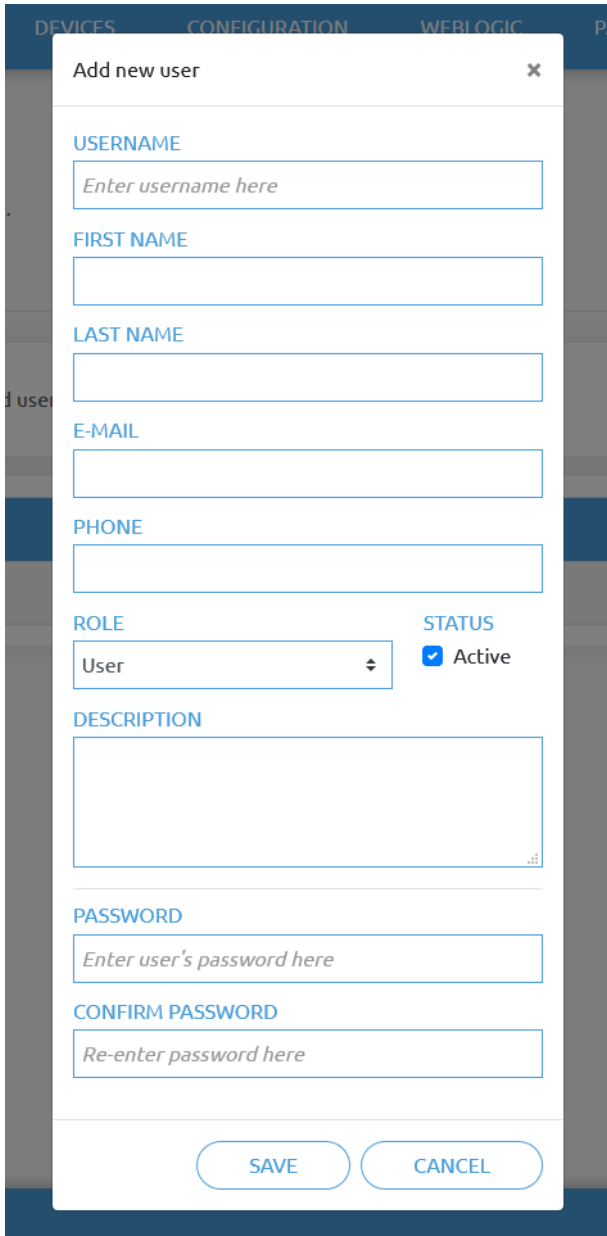
This page has two tabs:

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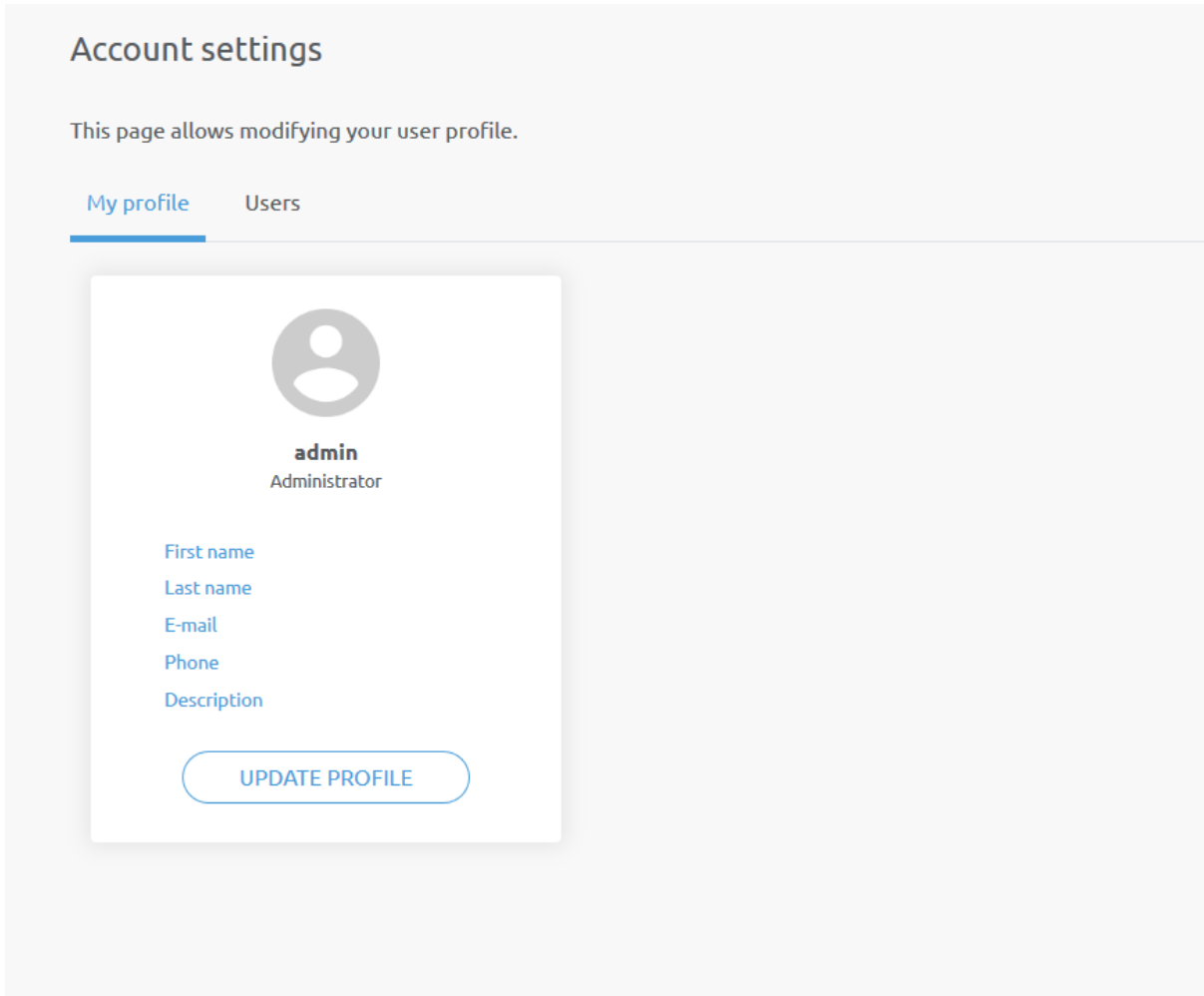
On the **Users** tab click on the **Add new user** button to add more users:

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					☑	✏	
operator	User					☑	✏	❌
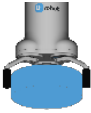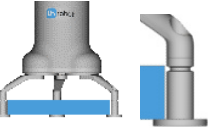
To prevent a user to sign-in either could be:

- 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. 3FG15

General Properties			Minimum	Typical	Maximum	Unit
Payload Force Fit		Grip	- -	- -	10 22	[kg] [lb]
		Flexible grip	- -	- -	8 17	[kg] [lb]
Payload Form Fit			- -	- -	15 33	[kg] [lb]
Grip Diameter*		External	4 0.16	- -	152 5.98	[mm] [inch]
		Internal	35 1.38	- -	176 6.93	[mm] [inch]
Finger position resolution			- -	0.1 0.004	- -	[mm] [inch]
Diameter repetition accuracy			- -	0.1 0.004	0.2 0.007	[mm] [inch]
Gripping force		Grip	10	-	240	[N]
		Flexible grip	10	-	140	[N]
Gripping force (adjustable)			1	-	100	[%]
Gripping speed (diameter change)			-	-	125	[mm/s]
Gripping time (including brake activation)**			-	500	-	[ms]
Minimum necessary finger movement			3	-	-	[mm]
Hold workpiece if power loss?			Yes			
Storage temperature			0 32	- -	60 122	[°C] [°F]
Motor			Integrated, electric BLDC			
IP Classification			IP67			
Dimensions [L, W, Ø]			156 x 158 x 180 6.14 x 6.22 x 7.08			[mm] [inch]
Weight			1.15 2.5			[kg] [lb]

* With the scope of delivery.

** 10 mm diameter distance. Also see section **Gripping methods**.

Operating Conditions	Minimum	Typical	Maximum	Unit
Power supply	20	24	25	[V]
Current consumption	43	-	1500 ***	[mA]
Operating temperature	5 41	- -	50 122	[°C] [°F]
Relative humidity (non-condensing)	0	-	95	[%]
Calculated operation life	30 000	-	-	[Hours]

*** 600 mA set as default.

Fingers

The supplied fingers can be mounted in 3 different positions to achieve different **Gripping Forces** and different **Gripping Diameters**.
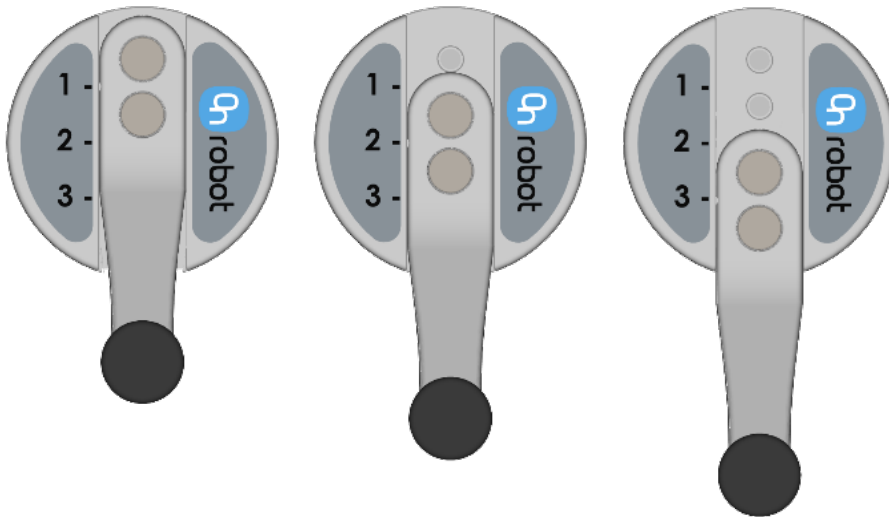
The delivered finger length is 49 mm (L in the drawing below). If custom fingers are required, they can be made to fit the gripper according to the dimensions (mm)[inch] shown below. The needed screws are M4x8mm (use 3 Nm tightening torque):

$[0.020]$
0.50 X 45°

A

2 x ∅ 4,50 [0,177] THRU ALL
⌴ ∅ 7,50 [0,295] ▽ 3,10 [0,122]
⟂ 0.05 [0,00197] A

$\begin{bmatrix} 0 \\ 0.551 & -0,002 \end{bmatrix}$
$\begin{matrix} 0 \\ 14 & -0,050 \end{matrix}$

$[0,354]$
9

L
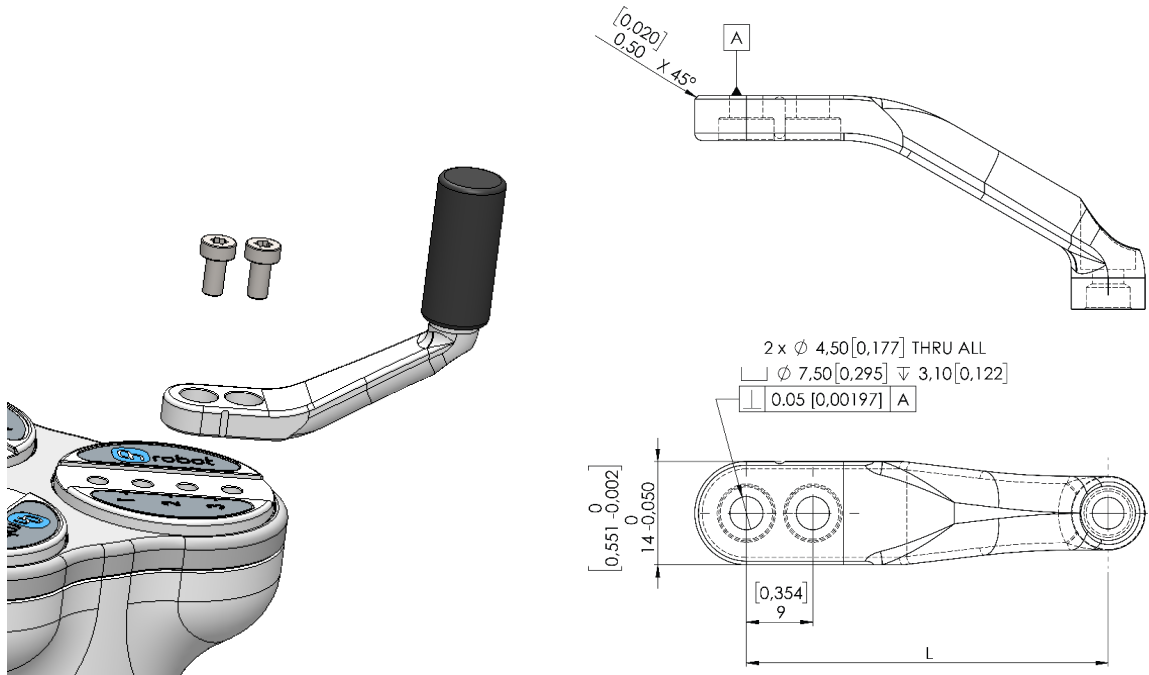
Fingertips

The supplied fingertips are listed below. Different fingertips will allow to achieve different **Gripping Forces** and different **Gripping Diameters**.

- Ø10 mm steel
- Ø13 mm steel
- Ø13.5 mm silicone
- Ø16.5 mm silicone

If custom fingertips are required, they can be made to fit the gripper's fingers according to the dimensions (mm)[inch] shown below. The needed screws are M4x8mm (use 2.5 Nm tightening torque):

M4 - 6H ▽ 8 [0,315]

A

[0,118]
3

[0,016]
0,40 X 45°

0
[0,23622 h7 -0,00047]
0
⌀ 6 h7 -0,012
⊥ 0.05 [0,00197] A
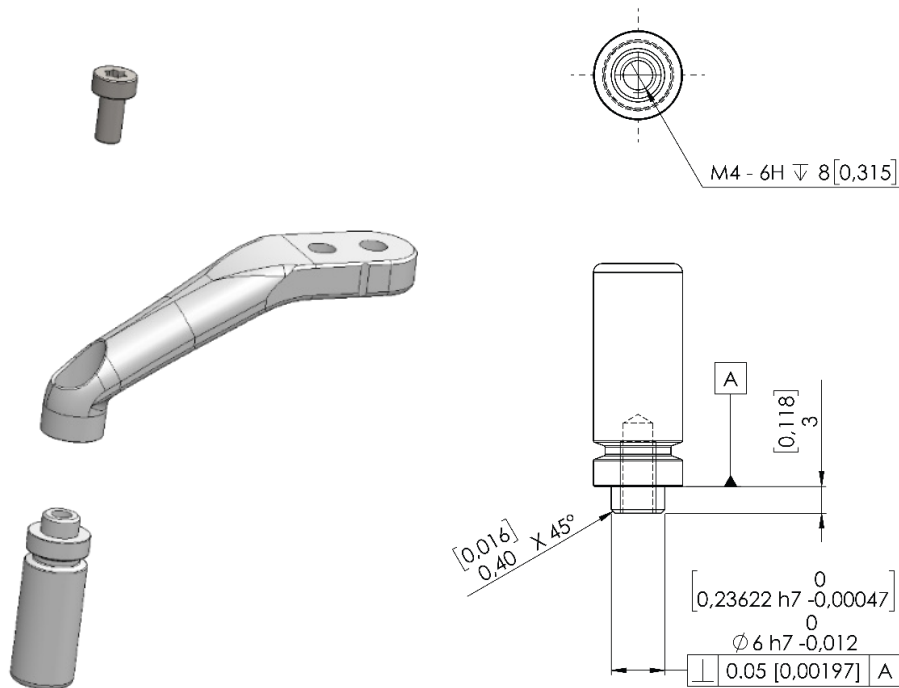
In the graph below, the maximum payload allowed for customized fingertip given a length is shown.

Fingertip Lenght vs Max Payload
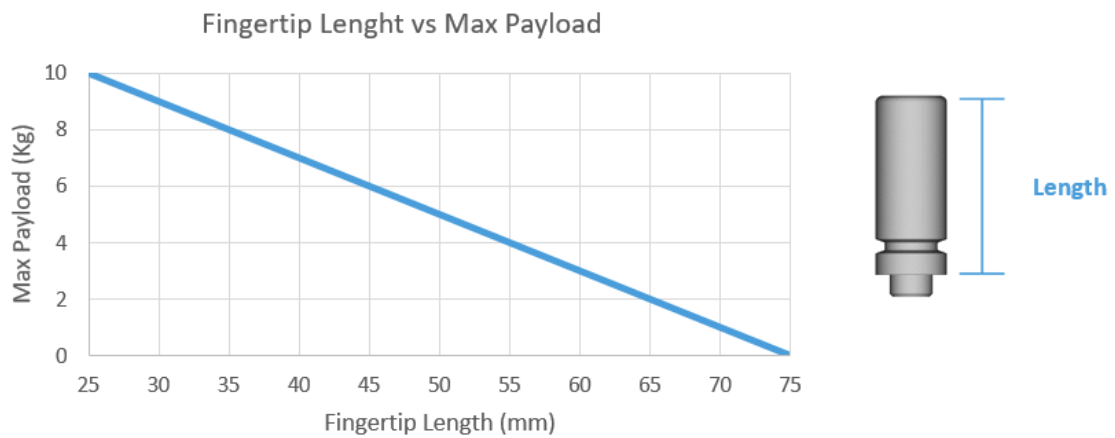
Length

In the graph below, how the % of maximum achievable force decreases as the finger length increases when customized fingertips are used.

Finger Lenght vs Force

Length
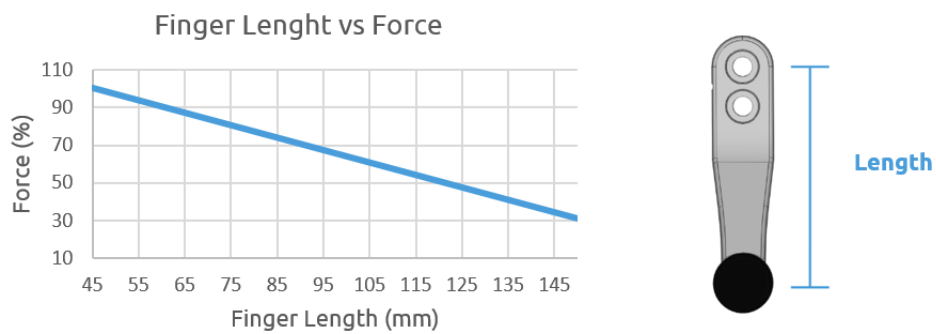
X-shape fingertips

These fingertips improve the gripper's ability to pick and place round workpieces with collar like features. By combining the force fit and the form fit gripping approaches, the fingertips increase the stability and payload of the workpiece to be gripped.
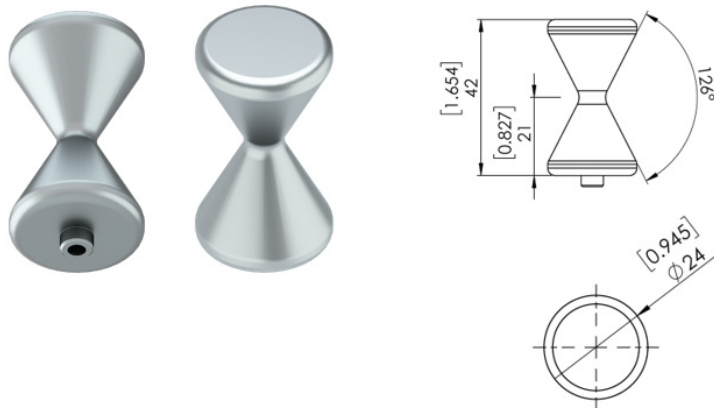
When these fingertips are used, set the fingertip diameter to 16 mm in the robot program. These fingertips are optional accessories and need to be purchased separately. To purchase these fingertips, please contact the distributor.

• 3FG X-Shape fingertips PN 105877

Internal/External grips

In the document the internal and external grip terms are used. These grips are related to how the workpiece is gripped.

External grip	Internal grip

Gripping methods

There are two different gripping methods how the 3FG15 can be operated. With each method, both internal and external gripping can be used.

Normal grip	Flexible grip
Use this gripping method if: • the diameter of the object is known and does not vary • more than 140 N gripping force is needed	Use this gripping method if: • the diameter of the object is not known or varies significantly • up to 140 N gripping force is sufficient

Normal grip

The gripping action has two phases:

Phase 1: For a safety reason, the fingers will start moving with a lower force (>140 N) to avoid damaging anything that could get clamped between the gripper fingers and the workpiece.

Phase 2: When the gripper diameter is very close to the programed target diameter, the gripper will increase the force to grip with the programed target force. After the grip, a break will be activated (tic sound). The activation of the brake, also known as, Force grip detected, can be verified in the provided functions. This brake will hold the workpiece with the applied force, with no power consumption and holding the workpiece in case of power loss. This brake will automatically be deactivated when the gripper performs a release or a new grip command. While programming the gripper, the brake can be deactivated by using the features in the GUI.

Flexible grip

The fingers will start moving with the set target force. If the gripper gets in contact with the object, it will grip with the programmed target force. After the grip, a break will be activated (tic sound). The activation of the brake, also known as, Force grip detected, can be verified in the provided functions. This brake will hold the workpiece with the applied force, with no power consumption and holding the workpiece in case of power loss. This brake will automatically be deactivated when the gripper performs a release or a new grip command. While programming the gripper, the brake can be deactivated by using the features in the GUI.

NOTE:

The achievable gripping speed is affected by the following parameters:

1. Using lower target force (F) than 100% can reduce the gripping speed.
2. The size of the target diameter: the bigger the target diameter (gripping near to fully open position), the lower the achievable gripping speed.
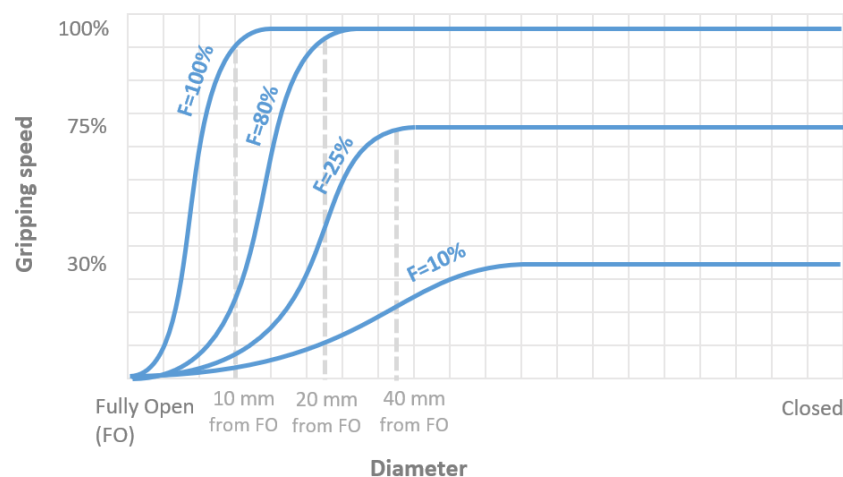
Gripping Force

The total gripping force highly depends on the finger angle θ. For both internal and external grip, the lower the finger angle, the higher the force that will be applied as shown in the graph below.

Although the fingers can move from 0 to 180, the angle range of an external grip is 30°-165° and for an internal grip 20°-160°
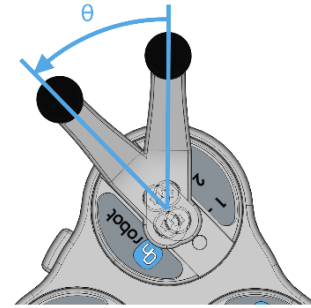
Maximum Force and Finger Angle θ
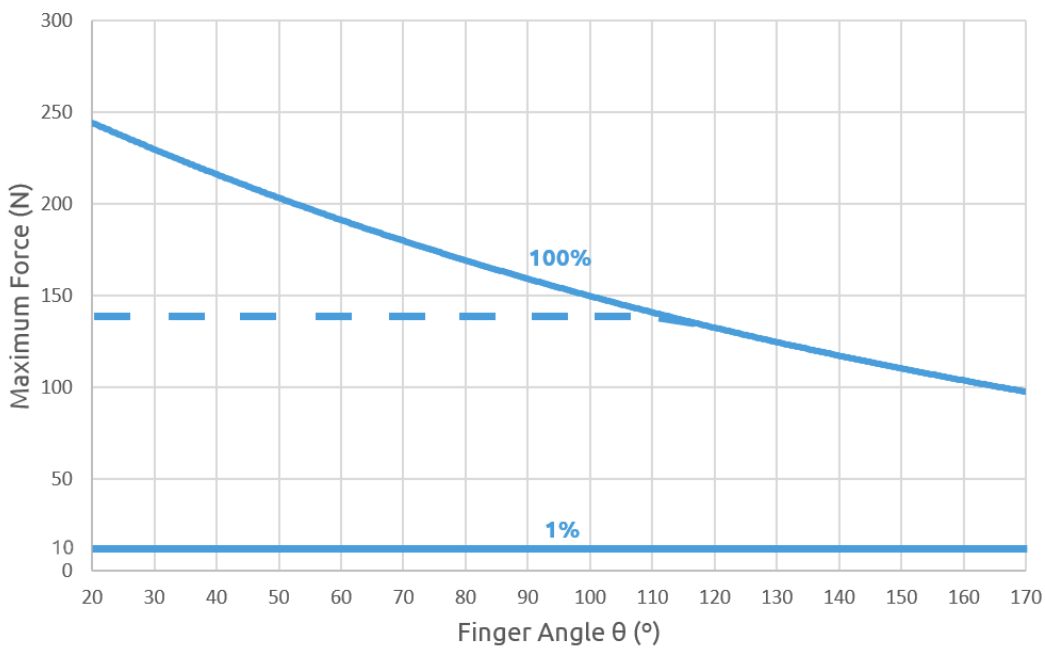
Graph plotted using measurements with 1 A current, silicone fingertips and a metal workpiece. The percetages shown on the graph stand for the target force percentage. The blue line stands for the normal Grip function and the dashed line stands for the Flexible grip function.

NOTE:

The total force applied depends on the finger angle, the input current (limited in some robots' tool flange connection) and the friction coefficient between the materials of the fingertips and the workpiece.

Gripping Diameter

The different configurations of the delivered finger and fingertips allow to achieve a wide range of diameters.

Finger Position	Fingertip (mm)	External Gripping range (mm)	Internal Gripping range (mm)
1	Ø10	10 - 117	35 - 135
	Ø13	7 - 114	38 - 138
	Ø16.5	4 - 111	41 - 140
2	Ø10	26 - 134	49 - 153
	Ø13	23 - 131	52 - 156
	Ø16.5	20 - 128	55 - 158
3	Ø10	44 - 152	65 - 172
	Ø13	41 - 149	68 - 174
	Ø16.5	38 - 146	71 - 176

Based on:

- Angle for external gripping min 165º (Pos 1), 163 ° (Pos 2), 161 ° (Pos 3) and max 30º (all 3 positions)
- Angle for internal gripping min 160º and max 30º

The closer to the maximum diameter range, the lower the angle and, therefore, the higher the force.

8.1.2. Quick Changers

Quick Changer

Name	Quick Changer I/O support – Robot Side	Quick Changer - Robot Side	Quick Changer - Robot Side 4.5A	Quick Changer - Robot Side
Item #	102326	102037	104277	109498
Version	QC-R – I/O	QC-R v2	QC-R v2-4.5	QC-R v3
Illustration				

Dual Quick Changer

Name	Dual Quick Changer	Dual Quick Changer 4.5A	Dual Quick Changer
Item #	101788	104293	109878
Version	Dual QC v2	Dual QC v2-4.5	Dual QC v3

Illustration			
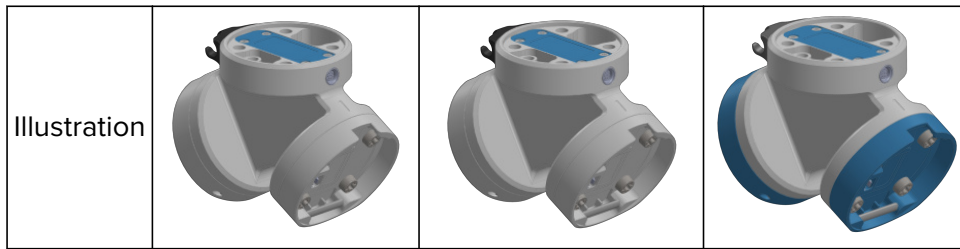
If not specified, the data represent the combination of the different Quick Changer types/sides.

Technical data	Min	Typical	Max	Units
Permissible force *	-	-	600*	[N]
Permissible torque *	-	-	60*	[Nm]
Rated payload *	-	-	20*	[kg]
	-	-	44	[lbs]
Repeatability	-	-	±0.02	[mm]
IP Classification	67			
Operating life (Tool change)	-	5.000	-	[cycles]
Operating life (Robot operation)	-	10	-	[M cycles]
Operating temperature	5	-	50	[°C]
	41	-	122	[°F]

* See static load capacity graph below.

	Quick Changer	Quick Changer for I/O	Dual Quick Changer	Quick Changer - Tool Side	Units
Weight	0.06	0.093	0.41	0.14	[kg]
	0.13	0.21	0.9	0.31	[lb]
Dimensions	See Mechanical dimension section				

QC-R V3 | DQC V3 and the QC-R V2 | QC-R V2-4.5A | DQC V2 | DQC V2-4.5A

The following graph shows the load capacity that the QC-R V3 | DQC V3 and the QC-R V2 | QC-R V2-4.5A | DQC V2 | DQC V2-4.5A can handle in a static situation. The values for a situation with an acceleration of 2g are half of the static values.

Static Load capacity
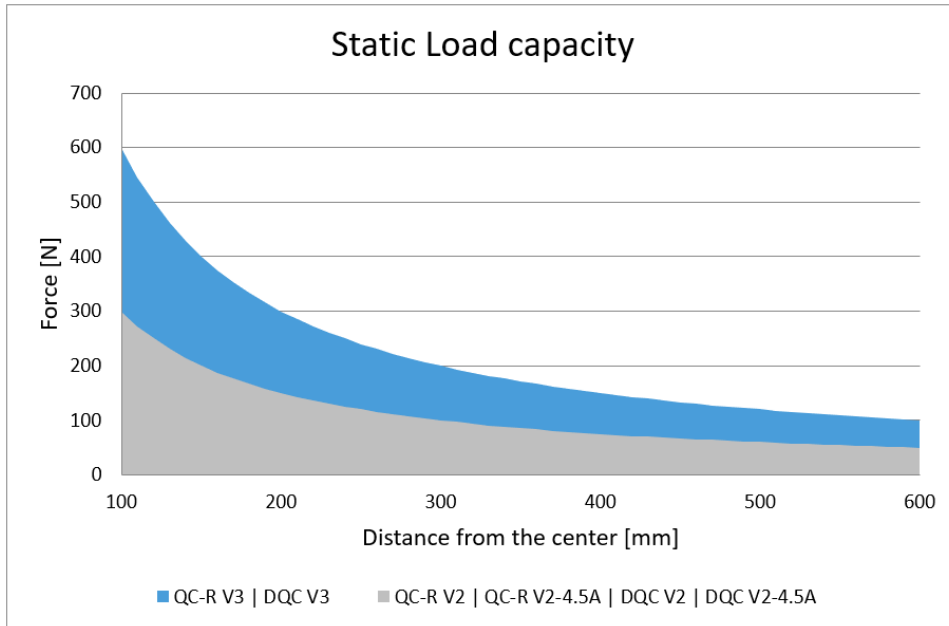
8.1.3. Compute Box

8.1.3.1. 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]

8.1.3.2. With 6.25A Wall Adapter (150W)

Supplied Wall Adapter	Minimum	Typical	Maximum	Unit
Input voltage (AC)	100	-	240	[V]
Input current	-	-	2.1	[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

8.1.3.3. 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. Mountings

8.2.1.1. Quick Changer - Robot Side
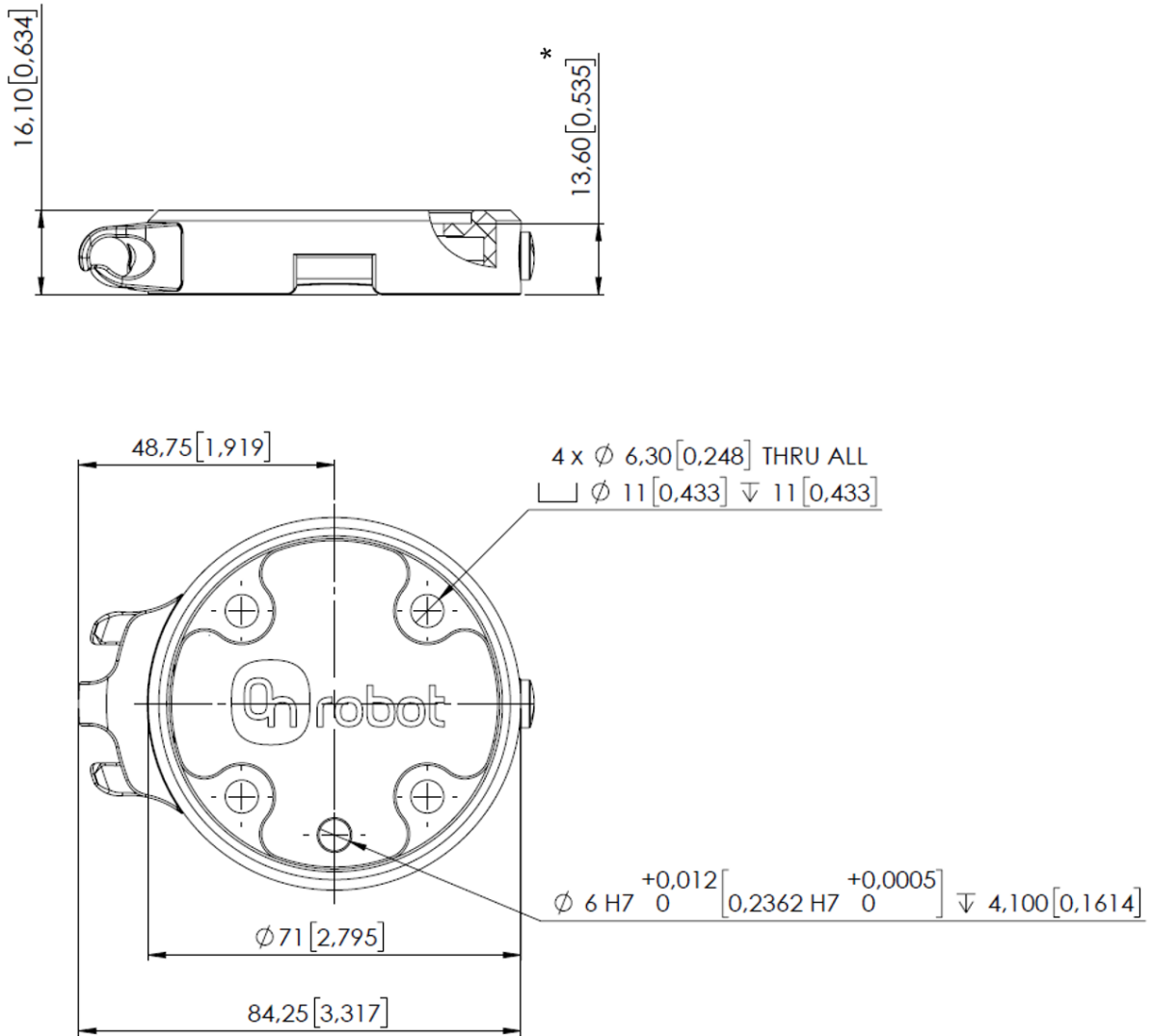
* Distance from Robot flange interface to OnRobot tool.

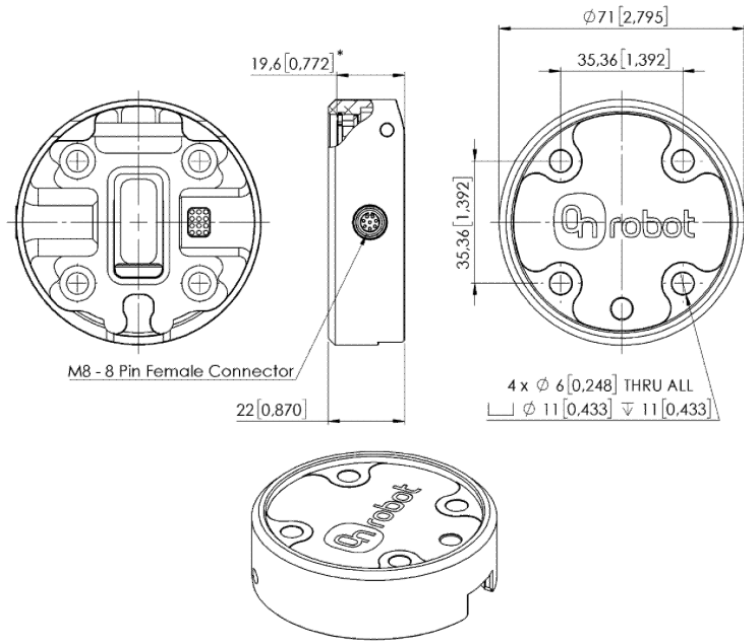All dimensions are in mm and [inches].

NOTE:

The cable holder (on the left side) is only required with the long (5 meter) cable.
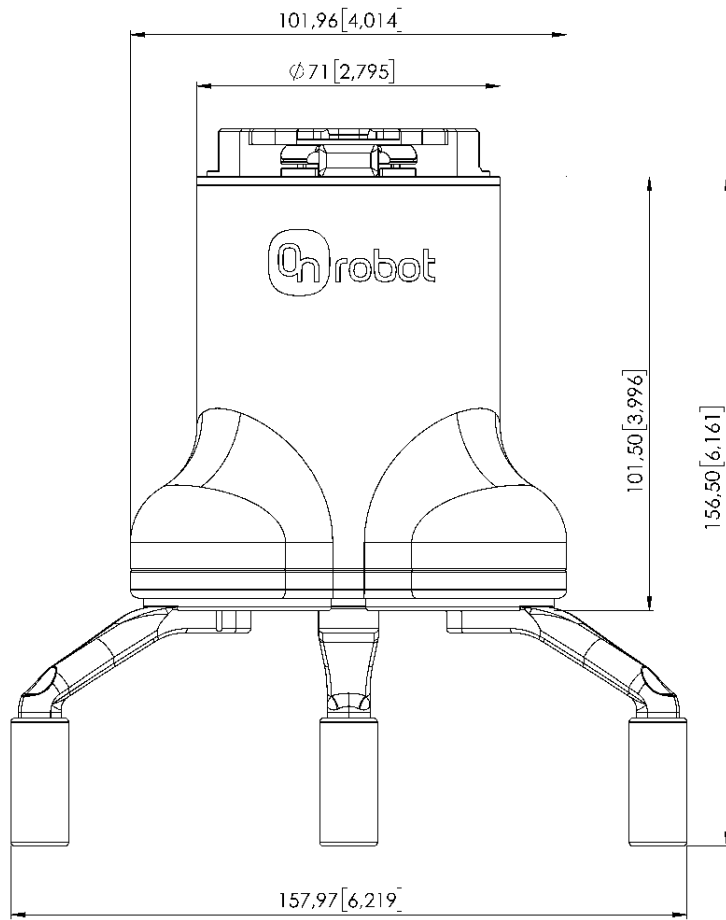
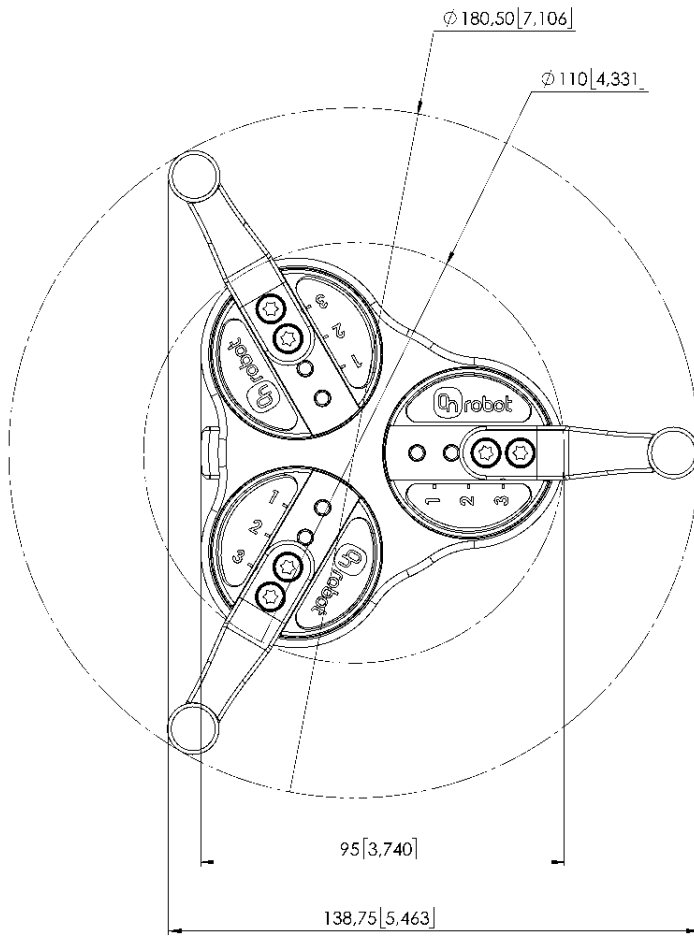### 8.2.1.2. Quick Changer for I/O - Robot Side

* Distance from Robot flange interface to OnRobot tool

All dimensions are in mm and [inches].

8.2.2. Tools

8.2.2.1. 3FG15

All dimensions are in mm and [inches].

8.2.2.2. Compute Box

Compute Box
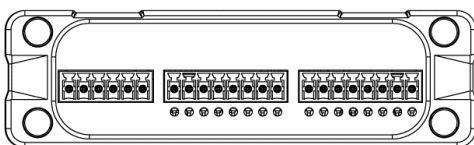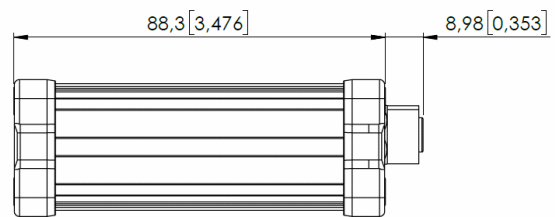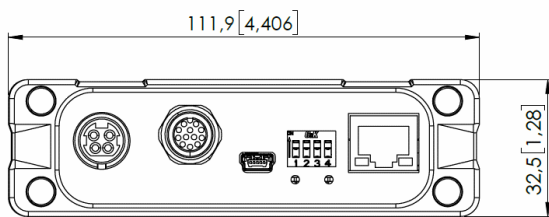
Clip-on Bracket (optional)
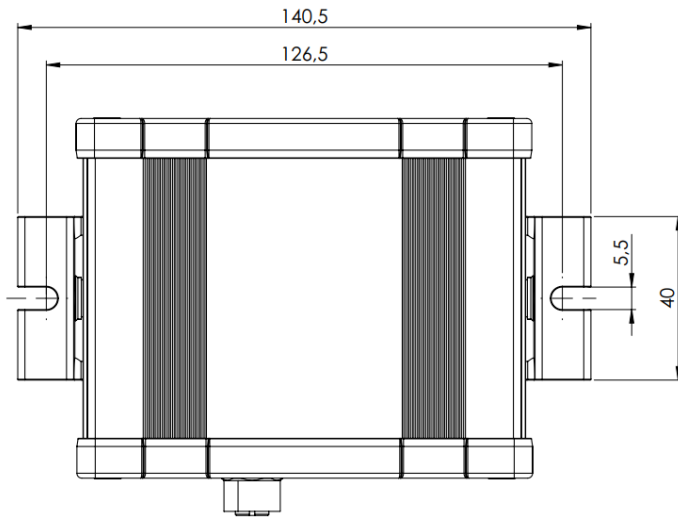
All dimensions are in mm and [inches].

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 **7.1.5. Web Client: TCP, CoG** section.

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

8.3.1. 3FG15

Coordinate system	TCP [mm]	Center of Gravity [mm]	Weight
	X=0 Y=0 Z=156	cX=0 cY=0 cZ=83	1.15 kg 2.5 lb

* With delivered fingers and 13.5 silicone fingertips on.

9. Maintenance

⚠️ **WARNING:**

An overall inspection of OnRobot's end-of-arm tooling and accessories 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 OnRobot's end-of-arm tooling, accessories 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. 3FG15

⚠️ **WARNING:**

Please check regularly the silicon fingertips since these parts can wear out.

If the fingertip is worn out , it can be ordered as spare part:

- Ø10 mm steel, PN 104160
- Ø13 mm steel, PN 104241
- Ø13.5 mm silicone, PN 104162
- Ø16.5 mm silicone, PN 104240

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. 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.

10.3. 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.

10.4. 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: Teglværksvej 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

ISO 9001:2015
Intertek

SWEDAC ACKREDITERING
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

12.1. Manufacturer Test Certificate

All OnRobot products are tested according to OnRobot test specification for the individual product that follows the ISO 9001 standard procedure. OnRobot testing procedure undergoes continuous review and improvement.

12.2. EMC

FORCE TECHNOLOGY

Attestation of Conformity no. 121-31033-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 (106034).
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), 2FGP20 Palettizing Gripper (108585), Dispense Tool (106816), Eyes Lighting Kit (107080), Lift100 Lifting robot (108800), MG10 (105202), OnRobot Eyes (103903), Pallet Station (109401), 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. 121-31033-A1

Standards/Normative documents

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

Additionally, for RG2 (102012), RG6 (102021), 2FGP20 Palettizing Gripper (108585) and Lift100 Lifting robot (108800):
IEC 61326-3-1:2017, Industry locations, SIL 2

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.

Signature

Knud A. Baltsen

Digitally signed by
Knud A. Baltsen
Date: 2022.03.23
17:16:22 +01'00'

Signed by: Knud A. Baltsen, Senior Specialist, Product Compliance

12.3. 3FG15 - Environment

Attestation of Conformity no. 120-23274

Assessment holder

OnRobot A/S
Teglværksvej 47H
5220 Odense SØ
Denmark

Product identification

OnRobot 3 Finger Gripper

FORCE Technology test reports

Environmental tests of 3 Finger Gripper, project no.: 120-23274, report no.: 120-23274-1 dated 30 September 2020

Other technical documentation

Conclusion

The 3 Finger Gripper have been tested according to the standards listed below. The test results are given in the Force report listed above. All tests were carried out as specified in the relevant specifications including special test criteria's stated by the client.

IP 6X	IEC 60529:2013
IP X7	IEC 60529:2013
Dry heat	IEC 60068-2-2:2007
Low temperature (cold)	IEC 60068-2-1:2007
Vibration - Endurance random	IEC 60068-2-64:2008
Shock test	IEC 60068-2-27:2008

Date	2021.01.21
Signature	

12.4. Declaration of Incorporation

12.4.1. 3FG15

CE/EU Declaration of Incorporation (Original)

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

The manufacturer:

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

declares that the product:

> Type: Industrial Robot Gripper
> Model: 3FG15
> 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

Vilmos Beskid
CTO