

MOUNTING INSTRUCTIONS
AND OPERATING MANUAL



KIT-UR-J

REVISIONS

DATE	REVISION	MAIN CHANGES
2018/5/21	Edition A	First release
2018/10/26	Edition B	Dedicated URCap release

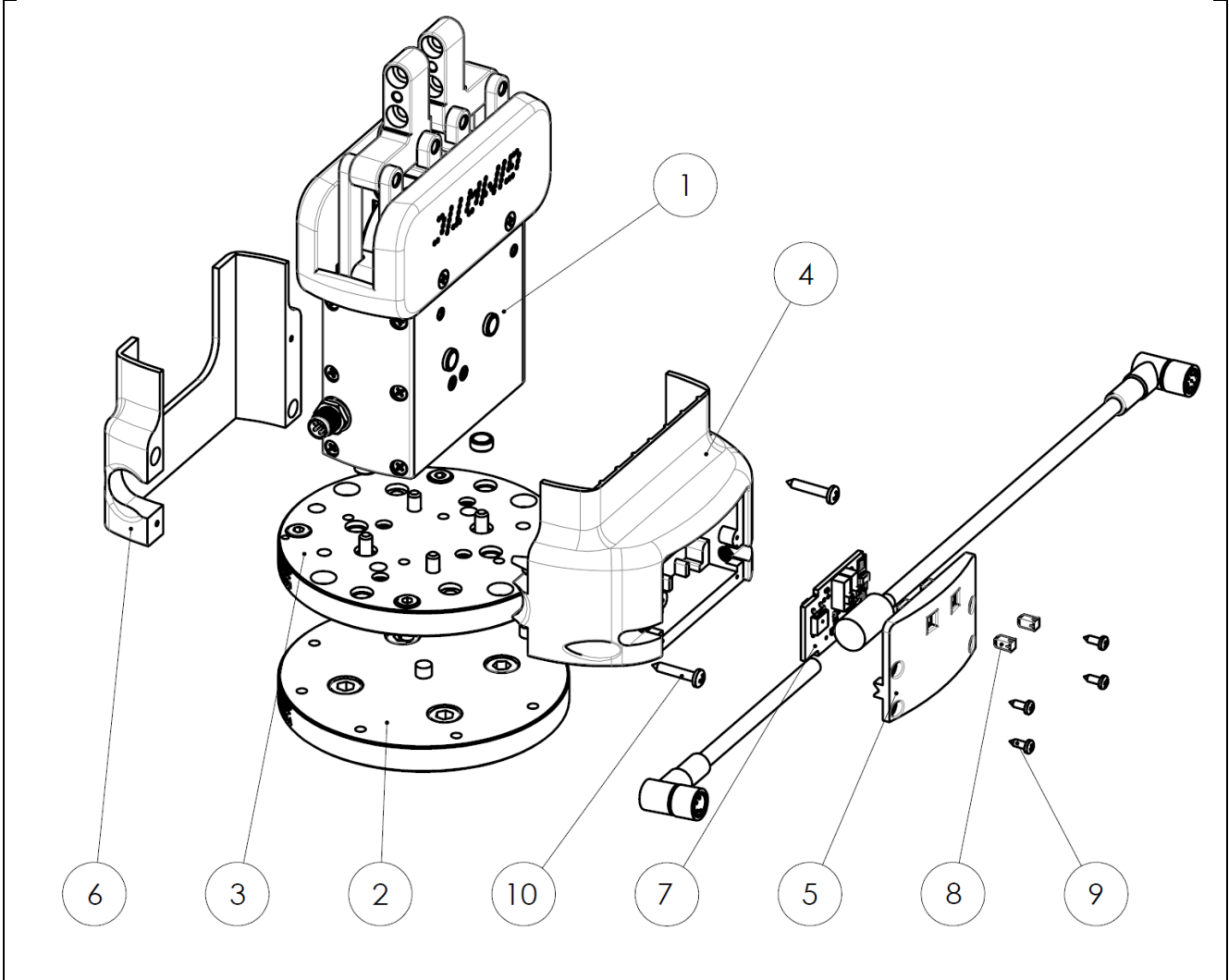
DOCUMENT LAYOUT

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- Exploded view drawing of the final assembly
- Itemized list of assembly's components
- Gripper's main data
- Capacitor Box
- Electrical connections to robot wrist
- Fixing system on the robot
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- Software: URCap
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- Electrical connections of the gripper
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DESCRIPTION

The KIT-UR-J is a plug & play gripping solution for UR3/UR5/UR10/UR16e collaborative robots by Universal Robot. This kit can be used in combination with any collaborative robot that provides a limited power supply capability at the wrist.

EXPLODED VIEW DRAWING OF THE FINAL ASSEMBLY



ITEMIZED LIST OF ASSEMBLY'S COMPONENTS

Position	Description	Q.ty	Code	Edition
1	Parallelogram Electric gripper (NPN, peak output)	1	MPRJ2553NP	A
2	Fixing kit electric gripper for UR robot (robot side)	1	MFI-A374-A	A
3	Fixing kit electric gripper for UR robot (gripper side)	1	MFI-A374-B	A
4	Frontal cover of the gripper	1	KIT-UR-019	A
5	Frontal cover's door	1	KIT-UR-020	A
6	Posterior cover	1	KIT-UR-021	A
7	Electric circuit capbox with cables	1	KIT-UR-024	A
8	Square Lens 3x3x6mm	2	GLSQ336-01	-
9	Self tapping screw 2.2x6.5	4	VITE-110	-
10	Self tapping screw 2.9X16 DIN 7981 C INOX A2	2	VITE-393	-

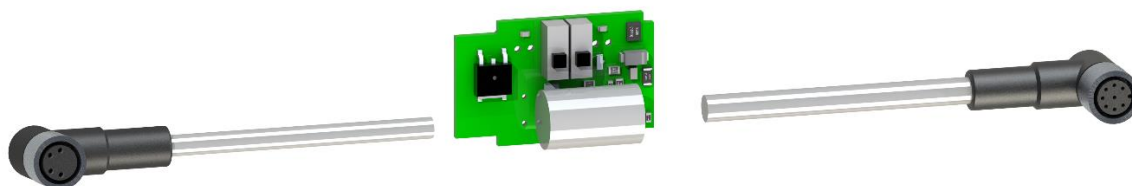
GRIPPER'S MAIN DATA



	MPRJ2553NP
Total gripping force	24 [N]
Stroke	53 [mm] (± 0.2 [mm])
Maximum frequency (at an ambient temperature of 30 [°C])	1.6 [Hz]
Jaw closing time	0.15 [s]
Gripper working time	0.24 [s]
Maximum duty cycle (at an ambient temperature of 30 [°C])	76%
Power supply	24 [Vdc] $\pm 10\%$
Peak current	1.2 [A]
Nominal current	0.4 [A]
Electrical connections	M8 4 poles
Open/closed input signal	NPN open collector
Operating temperature	5÷60 [°C]
Environmental degree	IP54
Mass	445 [g]

CAPACITOR BOX

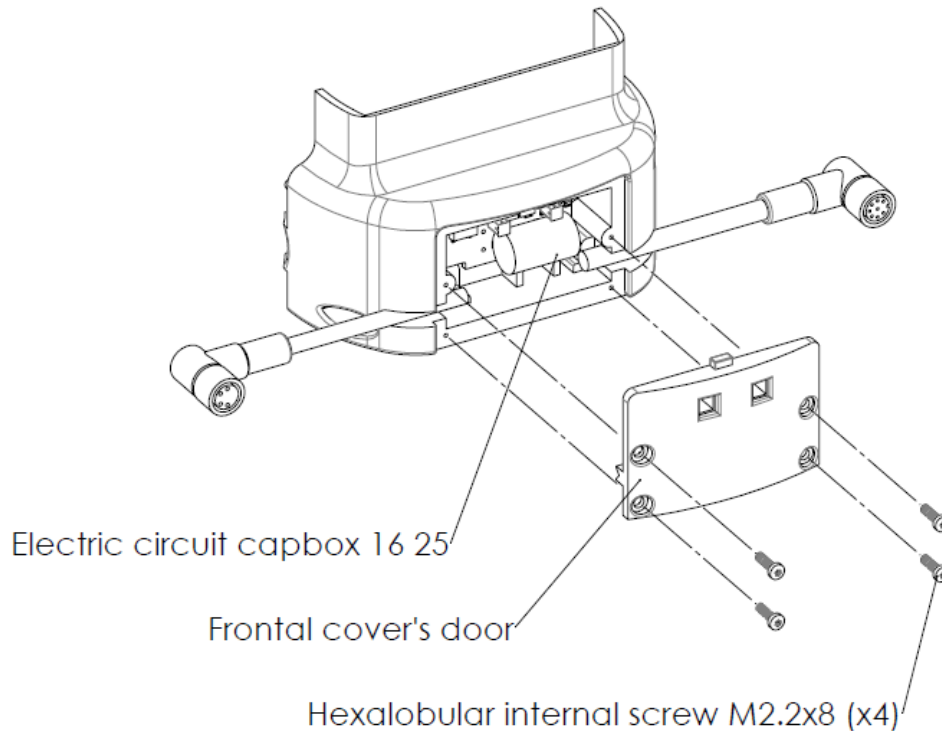
The Capacitor Box circuit has an input side and an output side. The input side allows for connection of power supply, command signal and auxiliary I/O by a M8-8pin female connector. The output side allows for direct connection of 4 pins Plug & Play grippers' models. Default configuration is with both input and output command signals in NPN version.



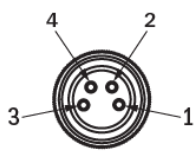
	CAPACITOR BOX
Overall dimensions	42 x 48.5 x 28 [mm]
Mass	70 [g]
Allowed temperature range	60 [°C]
Electrical connections	Input: M8 - 8 poles female Output: M8 - 4 poles female
Environmental degree	IP66
Power supply	24 [Vdc] $\pm 10\%$ 0.5 [A]rms
Input command signal (default configuration)	NPN command type
Output command signal (default configuration)	NPN command type

If necessary, the user can customize the configuration of the input and the output by simply referring to the following steps:

- To access the CAPBOX electric circuit, unscrew the four M2.2x9 Hex-lobular internal screws and pull out frontal cover's door.

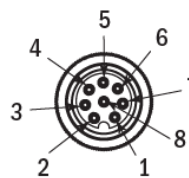


- Choose the type of input and output desired by the two selectors (please refer to following pictures and connections schema)



M8 4 pin femmina
M8 4 pins female

1	Marrone	Brown
2	Bianco	White
3	Blu	Blue
4	Nero	Black

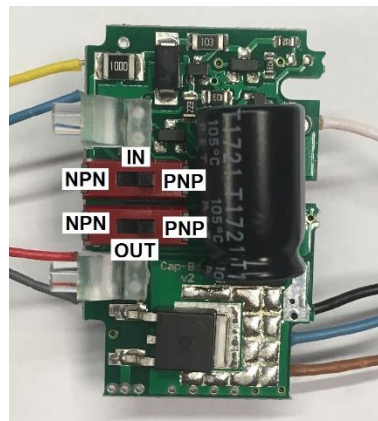


M8 8 pin femmina
M8 8 pins female

1	Bianco	White
2	Marrone	Brown
3	Verde	Green
4	Giallo	Yellow
5	Grigio	Grey
6	Rosa	Pink
7	Blu	Blue
8	Rosso	Red

Cavo d'ingresso standard
Standard input cable

I/1	+24Vcc	Grigio Grey
I/2	GND	Rosso Red
I/3	Ingresso digitale Digital input	Blu Blue
I/4	I/O ausiliari Auxiliary I/O	/

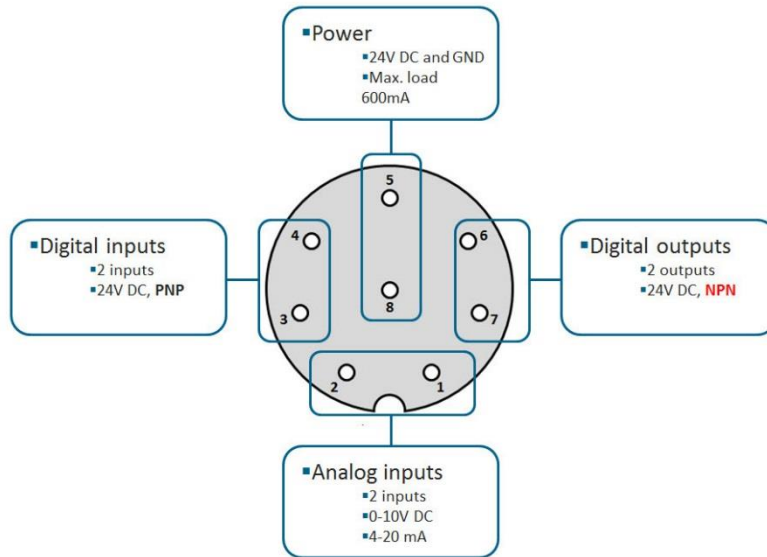


Cavo d'uscita standard
Standard output cable

O/1	+24Vcc	Marrone Brown
O/2	GND	Blu Blue
O/3	Uscita digitale Digital output	Nero Black
O/4	I/O ausiliari Auxiliary I/O	/

ELECTRICAL CONNECTIONS TO ROBOT WRIST

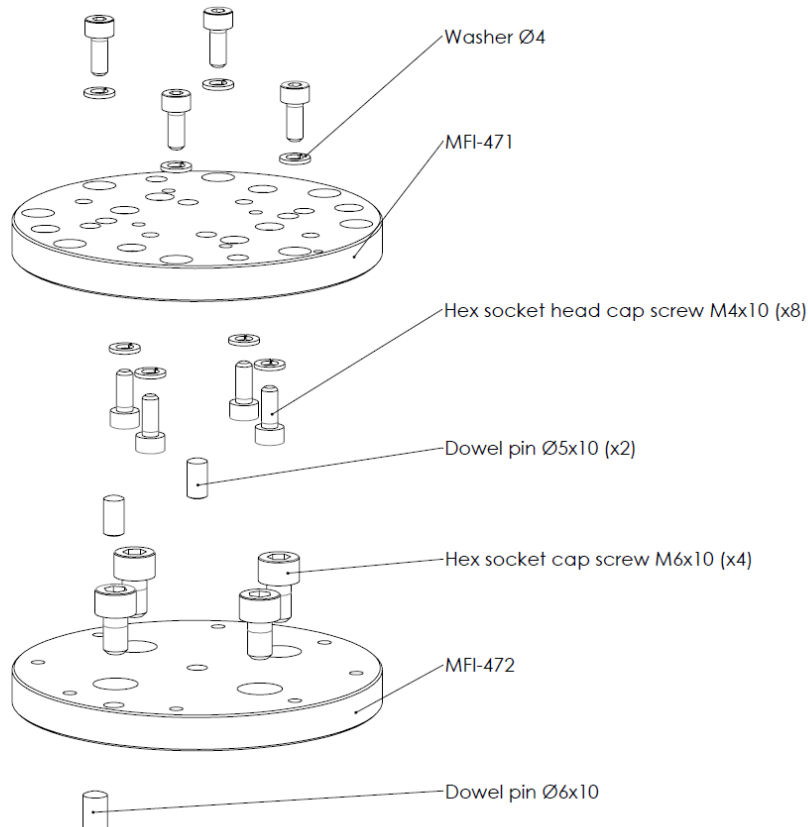
The following picture shows the electric connection schema of the connector located at the wrist of UR collaborative robots. The CAPBOX unit has been designed to be directly connected to the robot wrist.



CAPBOX CONNECTION	UR CONNECTION
I/1 - +24Vcc - GREY	PIN 5 - +24Vcc
I/2 - GND - RED	PIN 8 - GND
I/3N - NPN digital input - BLUE	PIN 7 - Gripper command
I/4 - Gripper's peak output - YELLOW	PIN 4 - Peak input

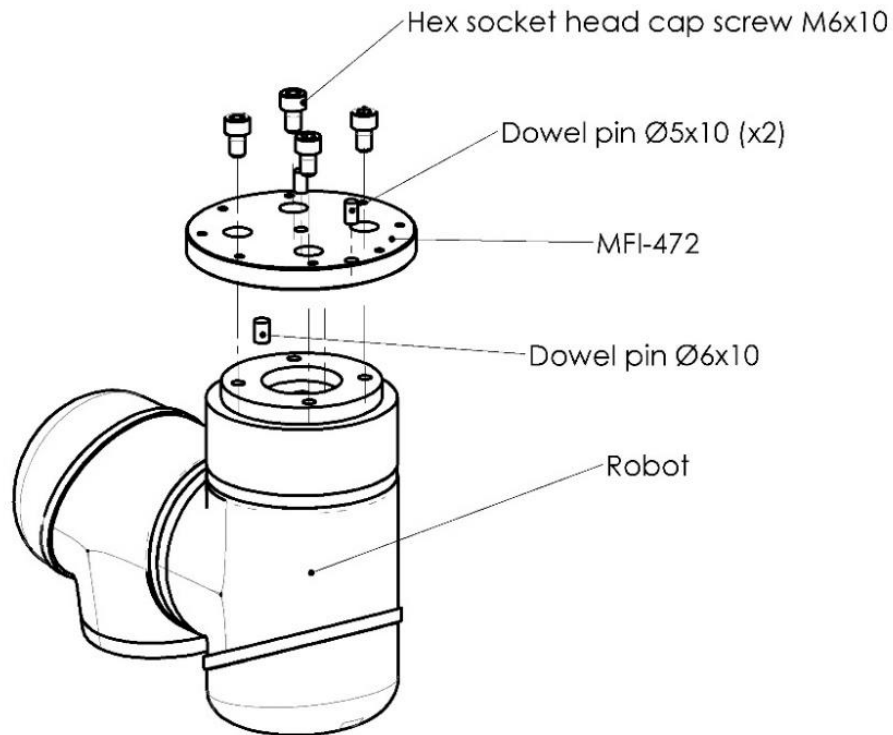
FIXING SYSTEM ON THE ROBOT

The following picture shows how MFI-A374-A and MFI-A374-B (Fixing kit electric gripper for UR robot) is composed.

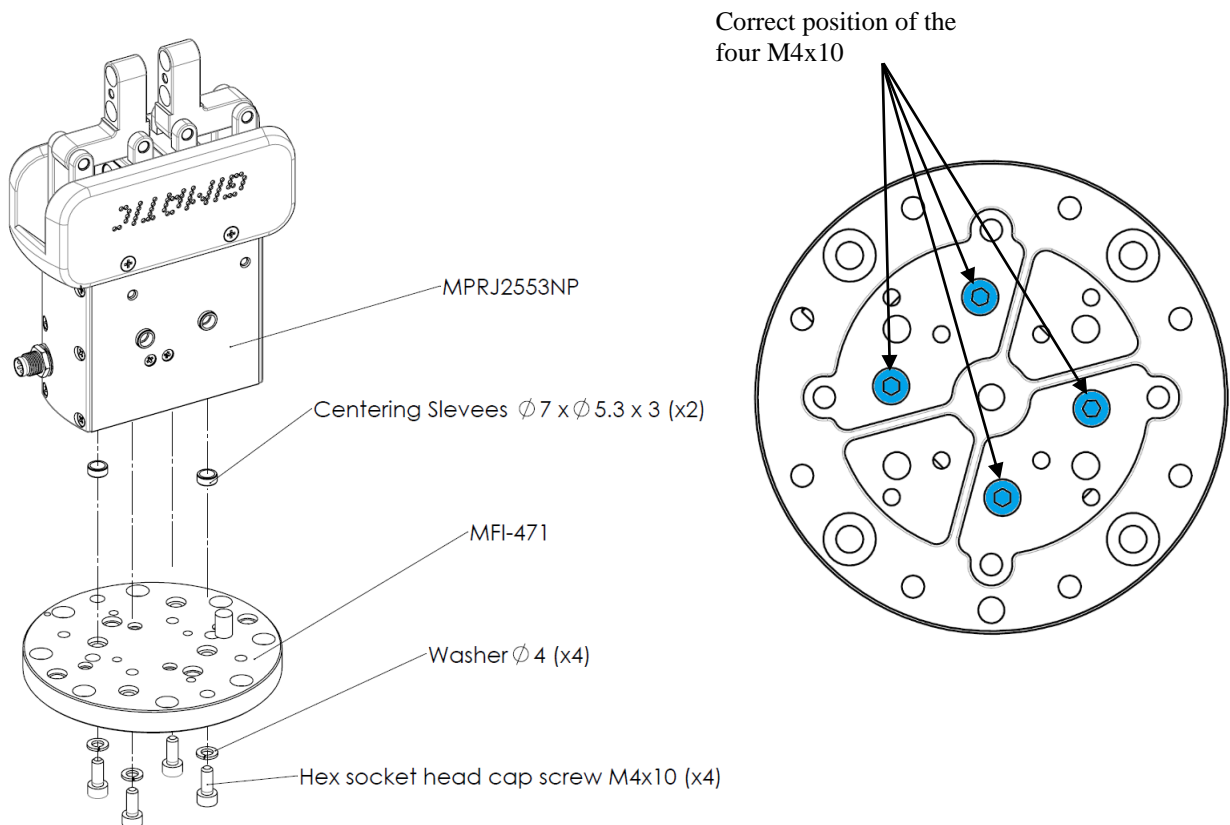


ASSEMBLY PROCEDURE

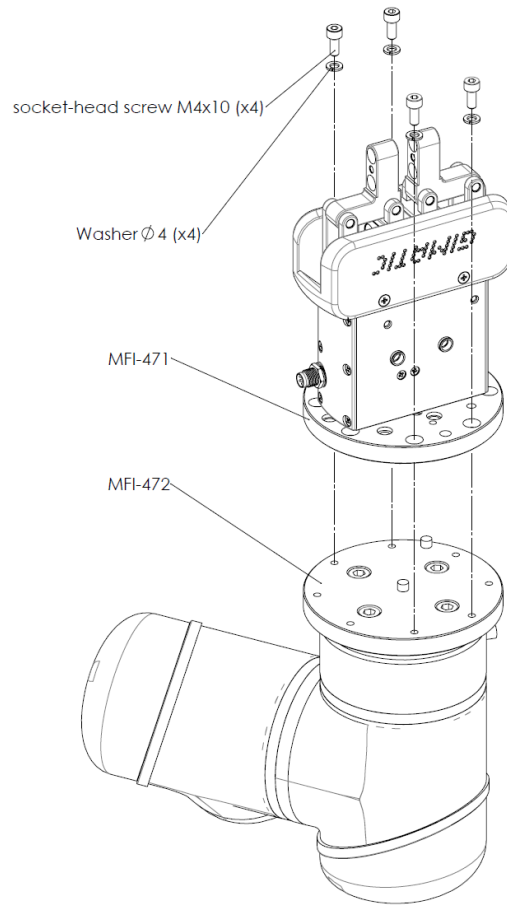
Insert four M6x8 hex socket head cap screws and three dowel pins into the mechanical flange MFI-472 and fix all to the robot flange.



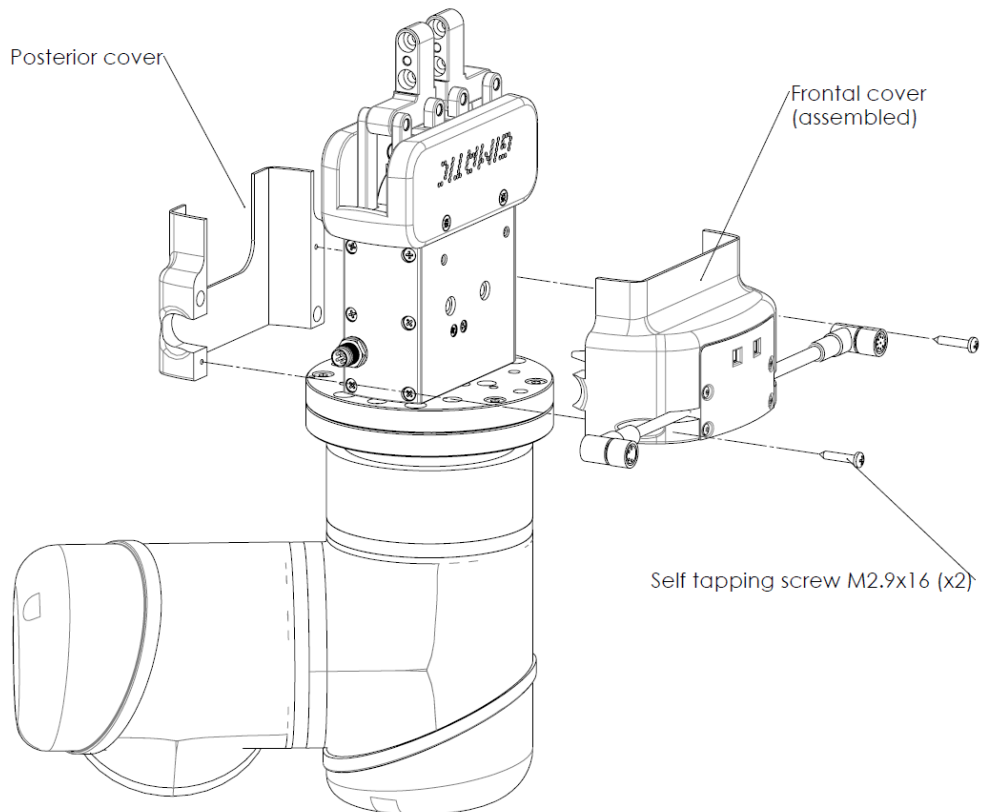
Fix the gripper to the mechanical interface MFI-471 by using two centering sleeves, four washers and four M4x10 hex socket head cap screws.



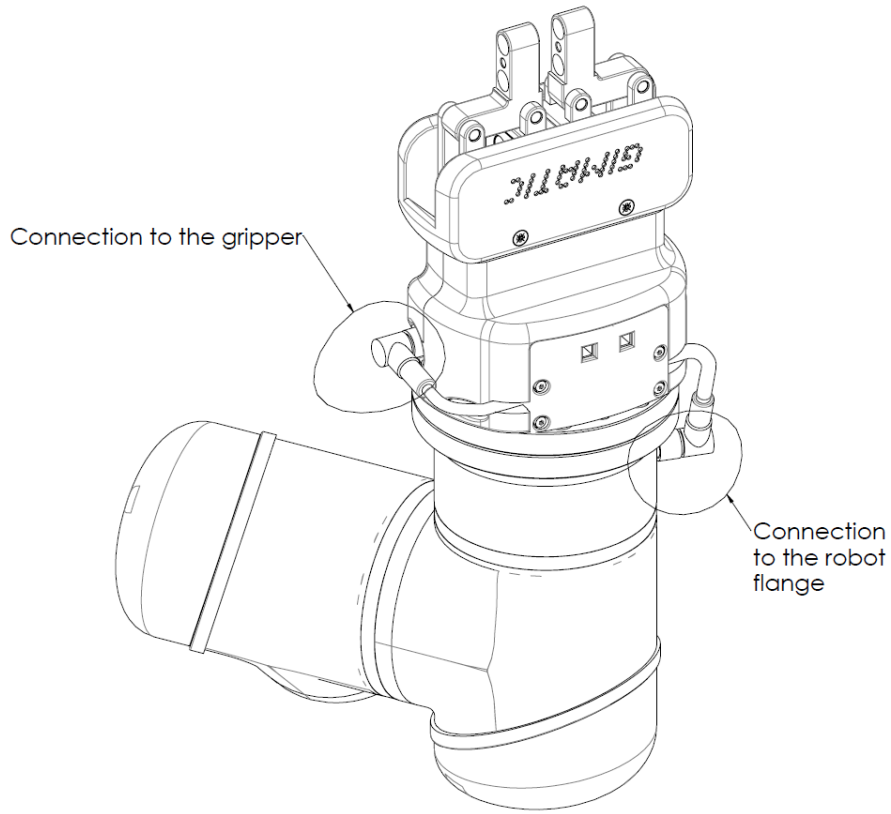
Fix the gripper subsystem to the robot wrist using four M4x10 hex socket head cap screws and four washers as shown.



Install the covers of the gripper KIT-UR-019 and KIT-UR-021 by using two M2.9x16 self-tapping screws.

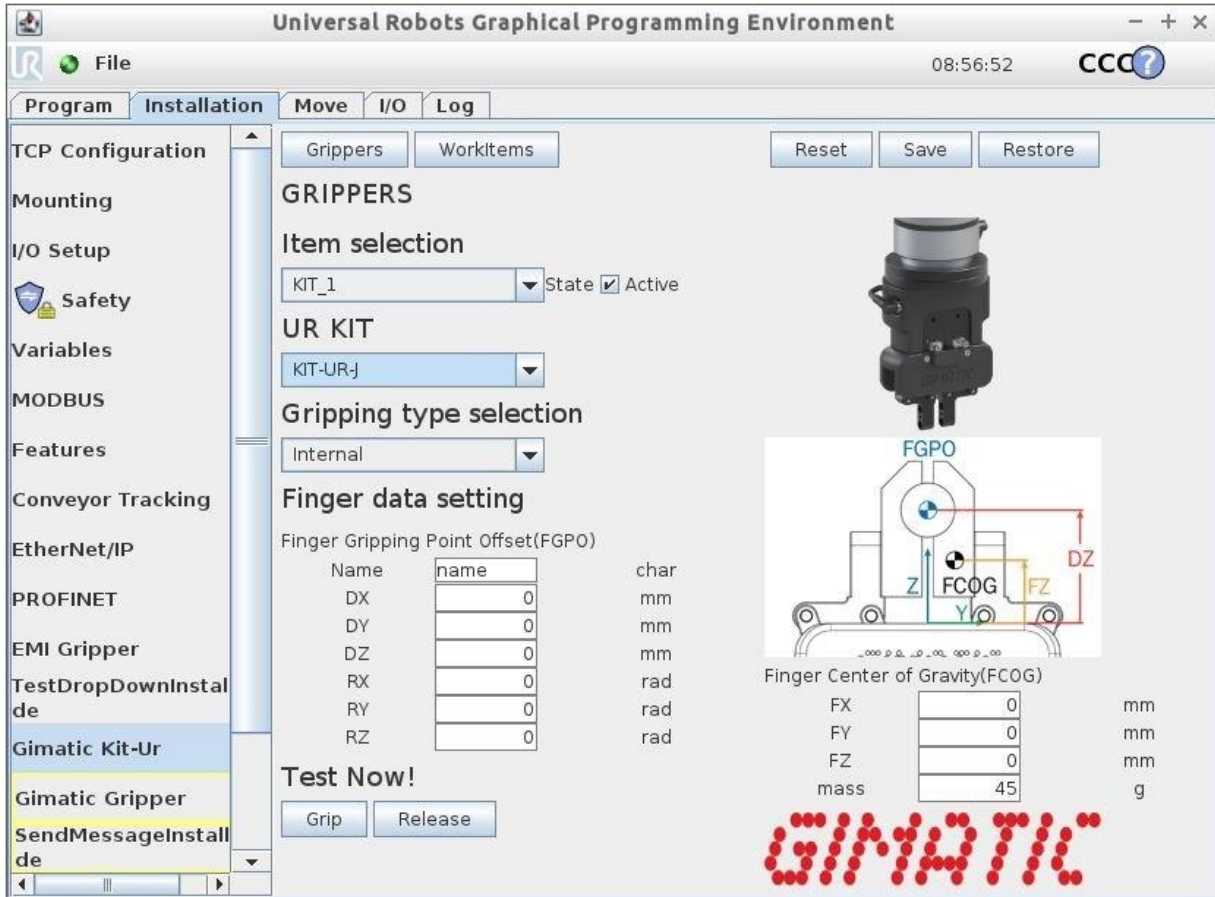


Connect the 4 poles wire CFGM890402P-01 from the electronic circuit CAPBOX-16-25-004 to the gripper MPRJ2553NP and connect the 8 ples wire CFGM890802P-01 to the robot flange.



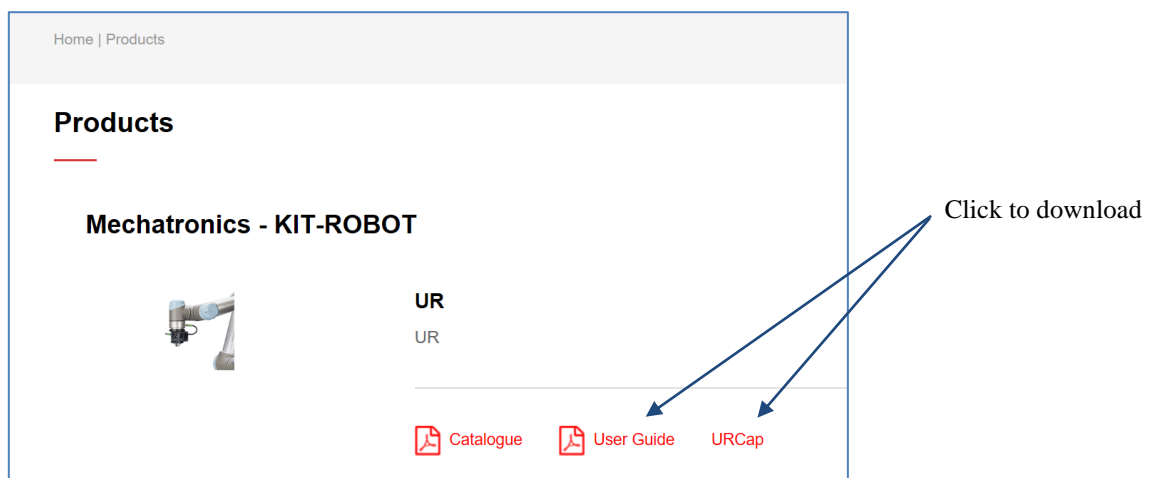
SOFTWARE: URCAP

URCap is a Polyscope PlugIn designed to control the KIT-URs as if they were parts of the UR robot: it allows an easy payload and Finger Gripping Point Offset (FGPO) assignment and automatic tool central point (TPC) update.



Download and Installation:

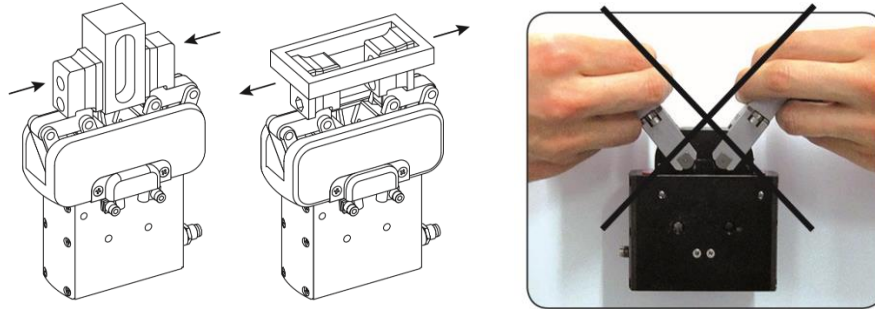
- 1) Download "URCap" and "User Guide" on Gimatic official website:
<http://www.gimatic.com/products/Details?language=en&catalogo=mechatronics¯ofamiglia=kit-robot&famiglia=ur>



- 2) Copy the "gimatic_gripper-1.0-SNAPSHOT.urcap" file on USB memory stick and plug it in the robot teach pendant.
- 3) Follow "IST-KIT-URCAP" instruction to install and configure the URCap.

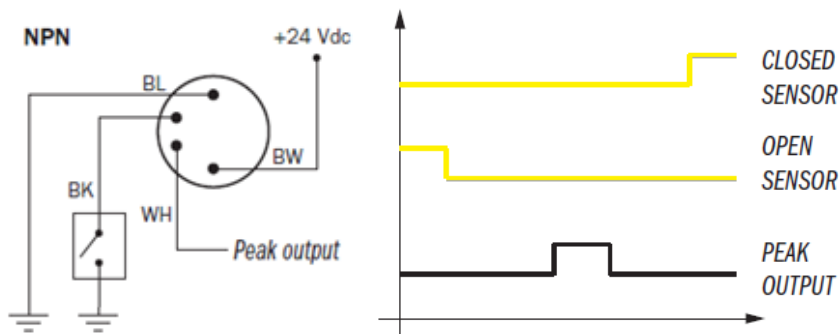
GRIPPING FORCE

Depending on the design of custom jaws, the electric gripper can be used for either external or internal gripping applications. The part will be gripped in any position within the jaw stroke. After the part is gripped, the spring force will hold the part (Motor OFF and ZERO consumption). Even in case of power black-out. Furthermore, the gripper mechanism is irreversible, even without power supply. Do not attempt to open or close the gripper manually.



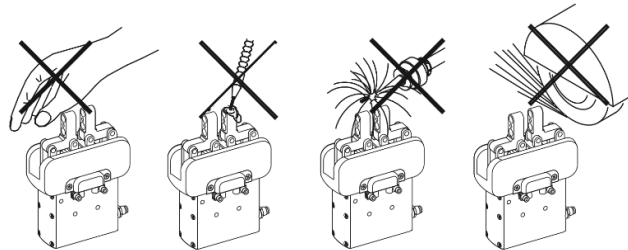
ELECTRICAL CONNECTIONS OF THE GRIPPER

The MPRJ2553NP comes with a M8 4 poles connector. Beside the power supply and the input command signal pins, the last pin is associated to a digital output channel which is automatically enabled by the device when the jaws exert the gripping force. This will work like an integrated proximity sensor which can operate independently of the initial position of the jaws, and therefore with no adjustment.



CAUTIONS

Never let the gripper come into contact with corrosive substances, soldering splashes or abrasive powders as they may damage the gripper. Never let personnel or objects stand within the operating range of the gripper. Never operate the gripper if the machine on which it is fitted does not comply with safety laws and standards of your country.



CE MARKING REFERENCE

The system is in conformance with:

Directive 2004/108/CE, EN 62233 (2008-04), EN 61000-6-2+EC+IS1 (2005-08;2005-09;2005-11), EN 61000-6-3+A1 (2007-01;2011-03), EN 61000-6-4 (2007-01), EN 55016-2-1+A1 (2004-10;2005-08), EN 55016-2-3 (2006-12), EN 61000-4-2 (2009-03), EN 61000-4-3+A1+IS1+A2 (2006-05;2008-02;2009-02;2010-07), EN 61000-4-4+A1 (2004-12;2010-03), EN 61000-4-5 (2006-11), EN 61000-4-6+A1+IS1 (1996-07;2001-12;2004-07), EN 61000-4-6 (2009-03),

CEI EN 60529 (1997-06).

DIMENSIONAL DRAWINGS

