RESPIRO

User manual

Ver. 1.0

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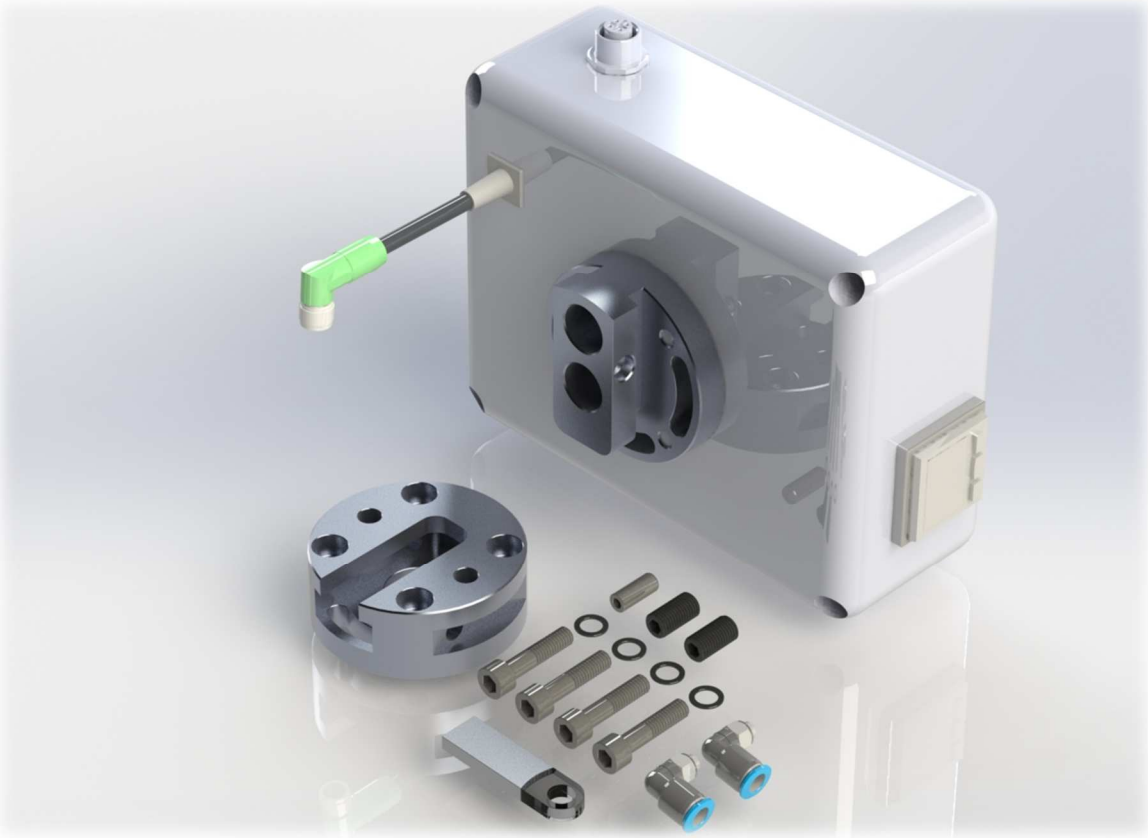
1. Preface

Congratulations with your new RESPIRO. RESPIRO is an electrical two channel vacuum pump. It can be connected to any kind of vacuum cups gripper. It can be used for pick&place and palletizing applications.

1.1. Scope of delivery



1 x RESPIRO

1 x Master tool changer

2 x Push-in elbow fittings

4 x M6 screws

1 x pin Ø6

1 x USB Stick (software + user manuals)

2. Safety

The RESPIRO is partly completed machinery and a risk assessment is required for each application the RESPIRO is used. It is important that all safety instructions herein are followed.

2.1. Responsibility

The system integrator is responsible for ensuring that the Robotic System and all used devices are installed and handled in accordance with the Safety Standards in the country where the installation takes place. The application and use of the necessary protection and safety devices, the issuing of declaration of conformity and any EC marking of the system are the responsibility of the Integrator.

2.2. General warnings

WARNING!

This section contains general warnings and caution.

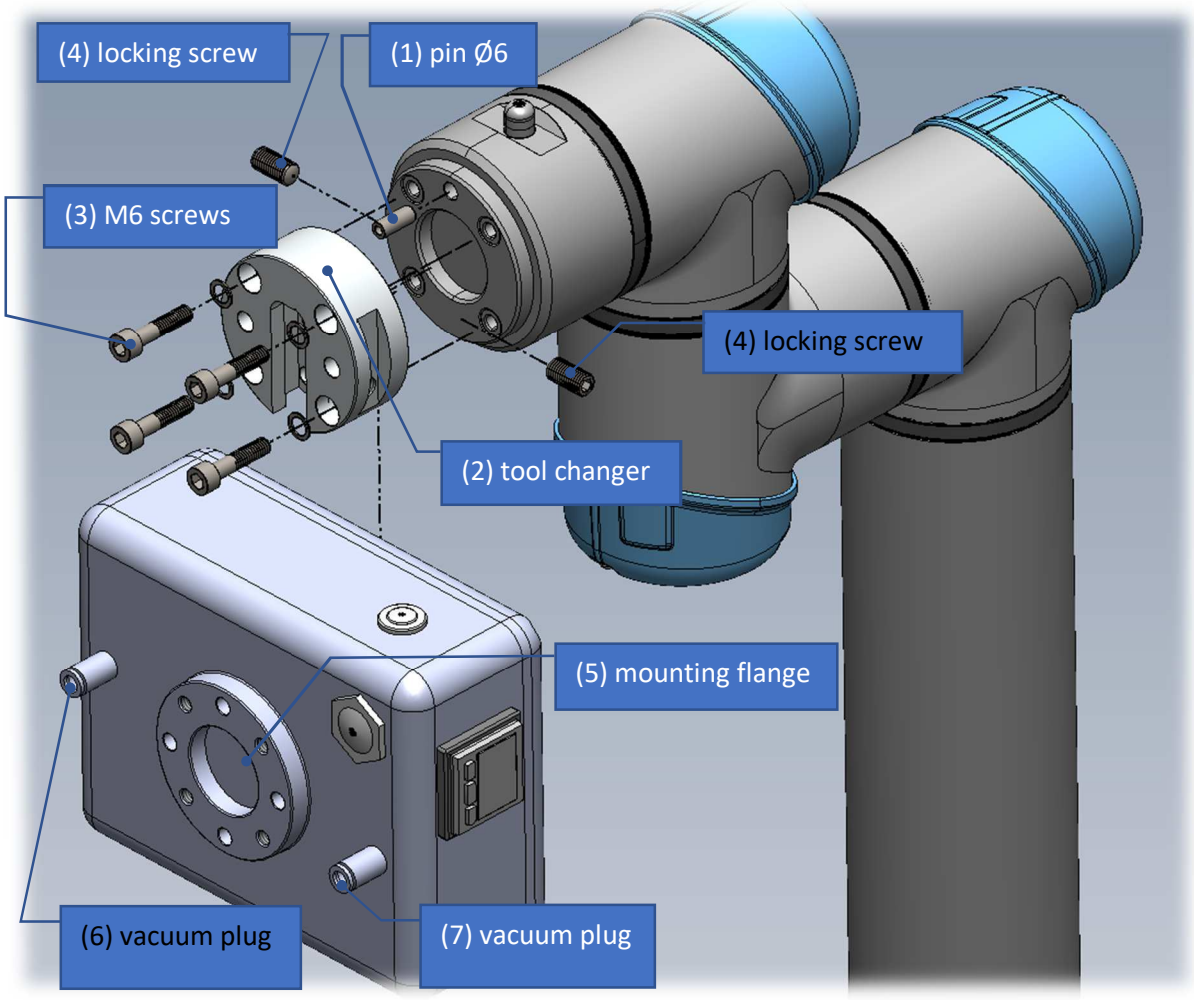
1. Make sure that tool changer, the RESPIRO, gripper and all other devices are properly mounted.
2. Make sure that there is no collision between devices mounted on the robot and robot arm or other obstacles.
3. Never use a damaged RESPIRO or another damaged device mounted on it.
4. Never modify the RESPIRO.
5. Make sure to follow the safety instructions of all equipment in the application.
6. Never pick with RESPIRO wet or oily objects. The contamination inside the RESPIRO can cause damage.

3. Technical data

GENERAL PARAMETERS		
Number of channels	2	
max Vacuum	-630 mbar	
Max payload	10 kg	22 lb
Operating voltage	24 VDC	
Dimensions W x L x H	160 x 125 x h73 mm (h106mm with tool changer)	
Weight	1,14 kg	
OPERATING CONDITIONS		
Temperature Celsius	Min 10	Max 50
Temperature Fahrenheit	Min 50	Max 122
Humidity	Min	Max

4. Installation

4.1. Mechanical interface



The mechanical assembly takes place in the following steps:

A) Put the Ø6 pin (1) into the robot flange

B) Tighten the tool changer (2) by M6 screws (3)

C) Slip the RESPIRO into tool changer (2)

D) Tighten the locking screws (4)

E) Mount the gripper on the mounting flange (5)

F) Connect the air tubes to the vacuum plugs (6) and (7)

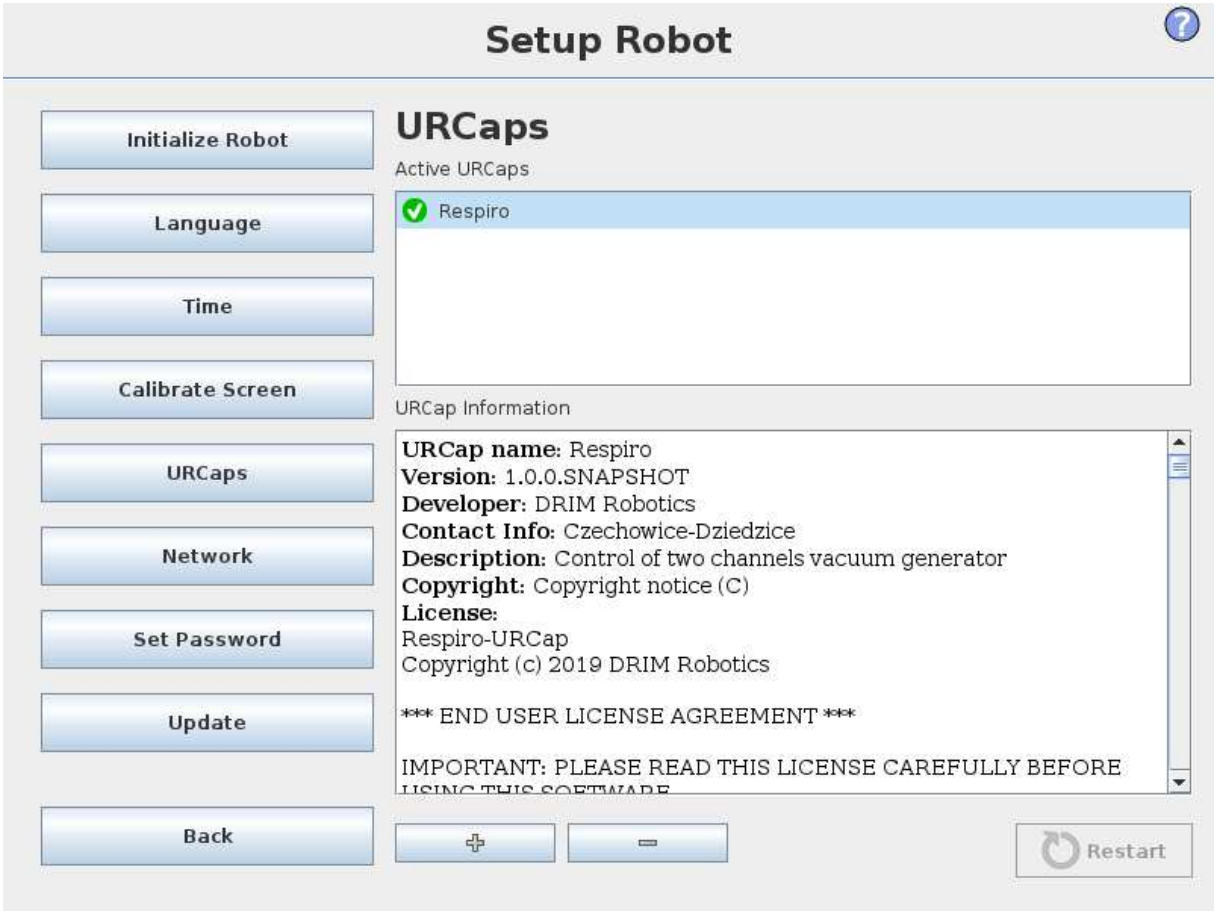
4.2. Electrical interface

The electrical installation consists in connecting the M8 plug to the socket on the robot's flange

CAUTION! Pins in robot connector are very fragile. Make sure to align robot and cable connector keys before fitting and do not use force.

M12 socket can be used to connect the presence sensor:

4.3. URCaps Instalation



In the top list an overview of all installed URCaps is presented. Click the “+” button in the bottom of the screen to install a new Uncaps. A file chooser is shown where a “urcap” file can be selected. Click “Open” and PolyScope will return to the setup screen. The selected URCap will be installed and a corresponding entry will appear in the list shortly after. Newly installed or uninstalled URCaps require PolyScope to be restarted and the “Restart” button will be enabled.

In the list, the icon shown next to an entry indicates the state of the URCap. The different states are defined below:

- The URCap is installed and running normally.
- The URCap is installed but unable to start. Contact the URCap developer.
- Restart: The URCap has just been installed and a restart is required.

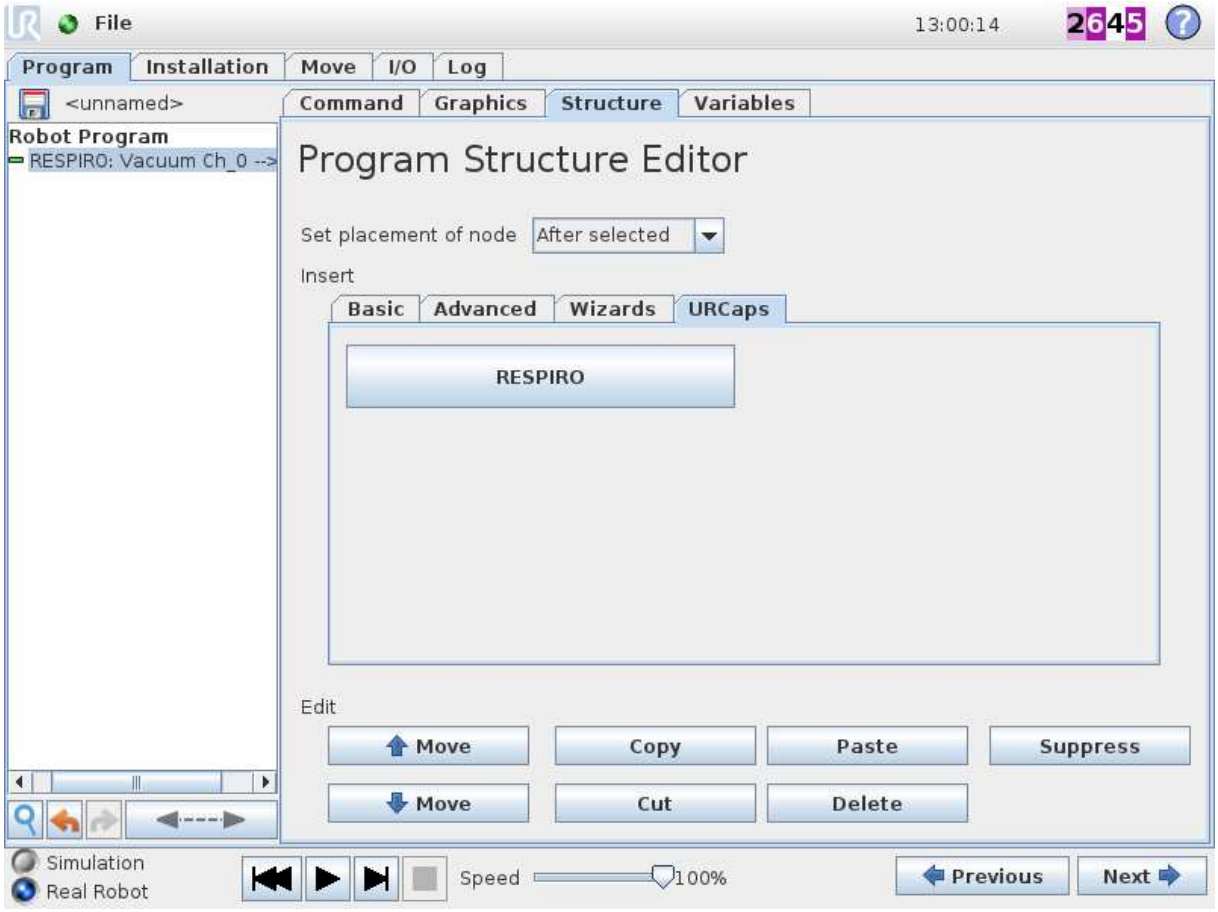
5. Programming

The RESPIRO is controlled by the I/O signals available on the robot's flange:

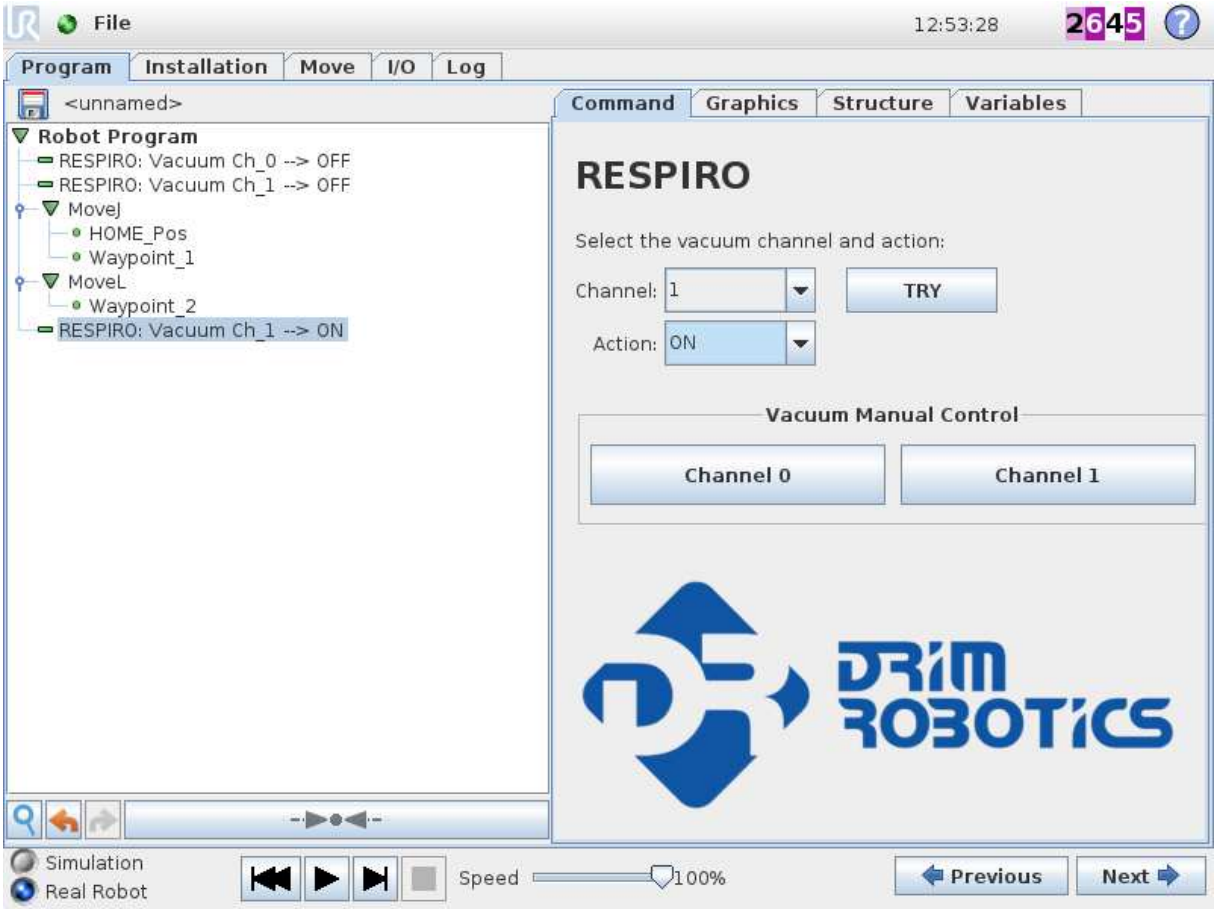
SIGNAL	NAME	FUNCTION
tool_out[0]	Vacuum_Ch0	ON/OFF the vacuum – channel 0
tool_out[1]	Vacuum_Ch1	ON/OFF the vacuum – channel 1
analog_in[2]	Pressure_Ch0	Underpressure level – channel 0
analog_in[3]	Pressure_Ch1	Underpressure level – channel 1
tool_in[0]	Freedrive	„Freedrive" button
tool_in[1]	Presence_sensor	The sensor connected to M12 socked

5.1. ON/OFF the vacuum

Enabling and disabling the vacuum in the program can be done by use the command „RESPIRO: Vacuum". This command is available from URCaps page:

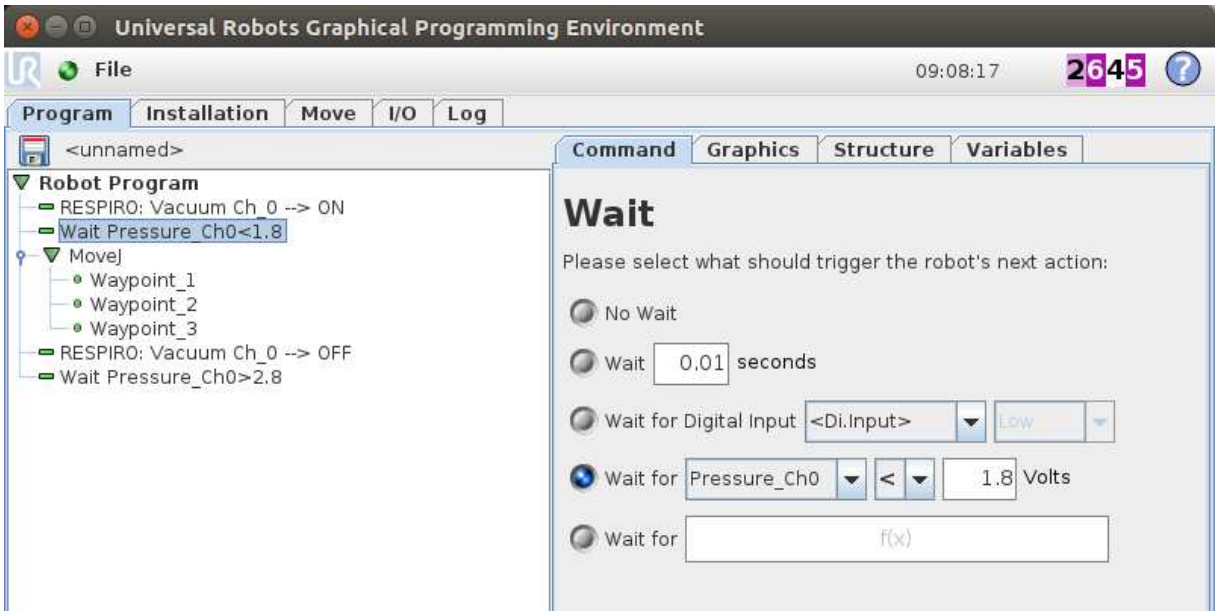


After inserting the command into the program, select which channel you want to use ("0" or "1") and what action you want to perform ("ON" or "OFF")



5.2. Check the vacuum level

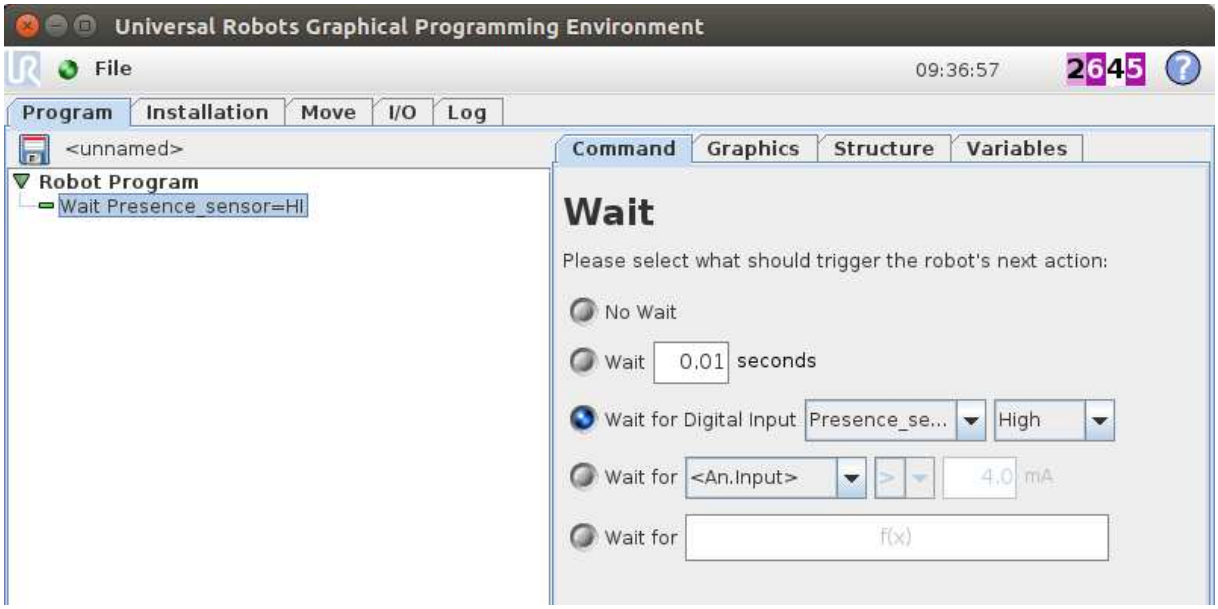
The vacuum level can be monitored by analogue inputs analog_in [2] and analog_in [3]. The input voltage changes linearly depending on the value of the vacuum: the lower the voltage, the lower the pressure. The voltage around 1.7 [V] corresponds to a pressure of -620 [mbar]. Voltage around 2.9 [V] corresponds to a pressure of 0 [mbar]. After enabling the vacuum, it is necessary to wait until the vacuum reaches a value that will prevent the object from falling down. The following part of the program shows how to properly check the vacuum level:



5.3. Check the presence sensor

Signal from sensor connected to the M12 socked is available on input tool_in[1] – “Presence sensor”.

State of this signal can be checked by “Wait” command or “If…else” command.



6. Declarations and certificates