WireTank Dispenser

User Manual

JUNE 2020

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Overview

WireTank Dispenser is a hardware and software solution that provides seamless integration of a dispensing system with a UR e-Series robot.

The system can be mounted on the robot tool flange, while power and communication are driven from the robot's M8 connector at the tool.

In cases where a tool changer is needed or the robot M8 connector is already in use, the hardware can also be mounted inside the robot cabinet.

Box Contents

1) USB Stick with URCAP and Getting Started Video
2) Control Bubble – Qty 1
3) 5cc Dispense Gun – Qty 1
4) Syringe Coupler – Qty 1
5) Robot Mounting Bracket – Qty 1
6) Cabinet Mounting Bracket – Qty 1
7) Short Gun Cable – Qty 1
8) Long Gun Cable – Qty 1
9) M6x8mm Screws – Qty 8
10) M4x10mm Screws – Qty 4
11) M4x6mm Screws – Qty 4
12) 5cc Syringe – Qty 2
13) Sample Tips

Mechanical and Electrical Specs

Mechanical Dimensions

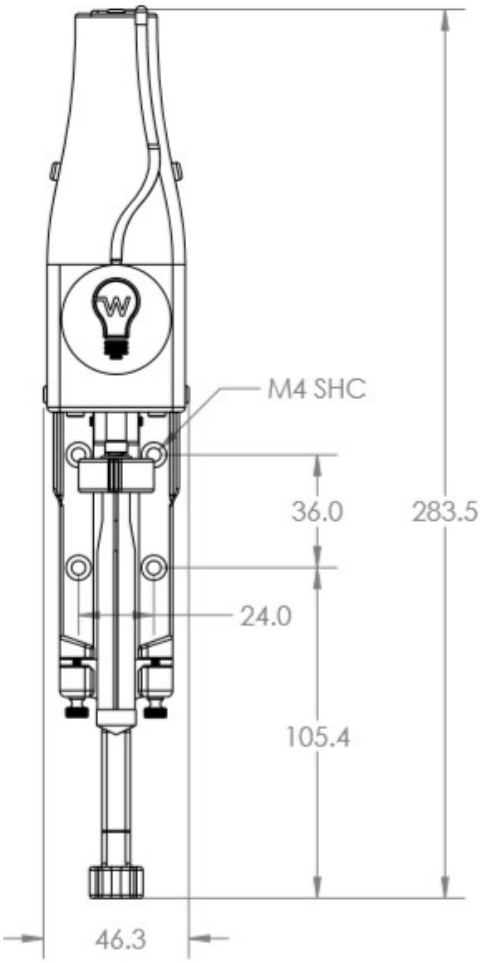

Figure 1 – Gun Mechanical Mounting Drawing

Electrical Power Requirements

Voltage Input Range	24 VDC
Maximum Power Input	18 W

Installation

Please watch "Getting Started" video in the provided USB Stick before continuing

Installation as Robot End Effector

Steps (Reference Figure 2, Figure 3, Figure 4, and Figure 5):

1) Unscrew Robot Mounting Bracket from Control bubble
2) Use the 4 provided M6x8mm screws to secure Robot Mounting Bracket to robot tool flange
3) Screw Control Bubble to Robot Mounting Bracket using provided M6x8mm screws so that the flat mounting flange is opposite to the robot M8 connector
4) Loop M8 connector cable around the tool flange and plug in to the robot M8 connector
5) Install Dispenser gun onto Control Bubble using the 4 provided M4x10mm screws
6) Connect gun cable from the control bubble to the dispenser gun making sure black arrows are facing forward towards the front of the gun in both cases.

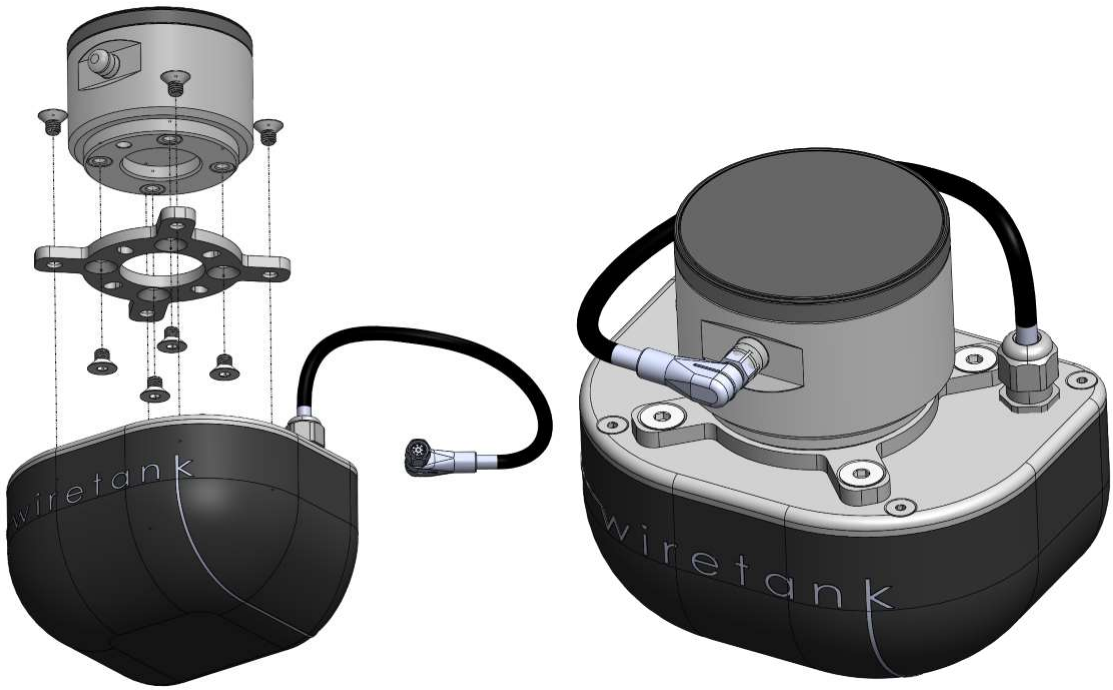

Figure 2 – Control Bubble Assembly

Figure 3 – Syringe Assembly

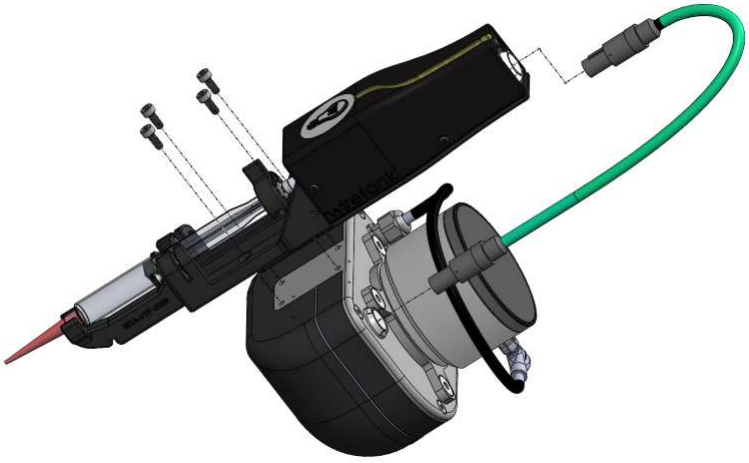

Figure 4 – Dispense Gun to Control Bubble Assembly

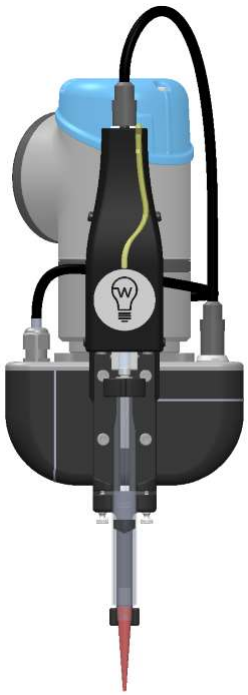

Figure 5 – Completed Assembly

Installation in Control Cabinet

Steps (Reference Figure 6, Figure 7, and Figure 8):

1) Unscrew Robot Mounting Bracket from Control bubble
2) Screw cabinet mounting bracket to Control bubble using the same M6x8mm screws
3) Remove cover if present from the Robot Controller Cabinet
4) Attach the “Cabinet Mounting Bracket” on the bottom of the Robot Controller Cabinet using the provided M4x6mm screws. Attach the screws from the inside of the cabinet and thread them into the “Cabinet Mounting Bracket”
5) Connect the gun cable from the Control bubble to the dispense gun.
6) Connect the USB Serial adapter to the serial port and into the USB port of the robot controller.
7) Connect the power jack and wire the leads to a 24Vdc power supply of the robot or to an external power supply
8) Connect the M8 connector from the Control Bubble to the M8 jack on the Cabinet Mounting Bracket.

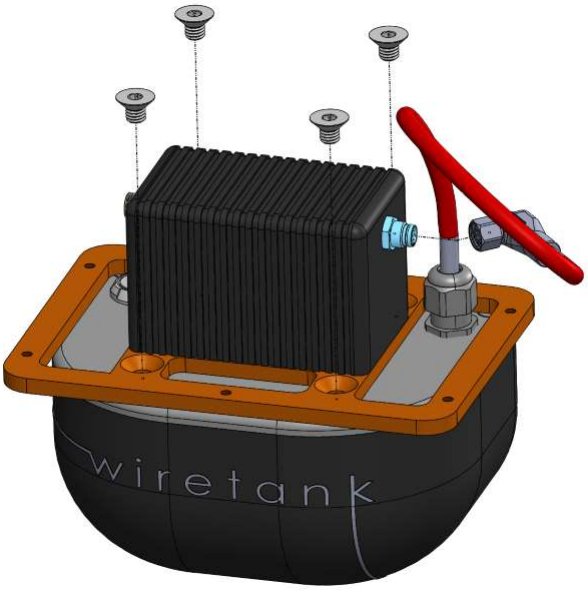

Figure 6 – Control Bubble to Mounting Plate Assembly

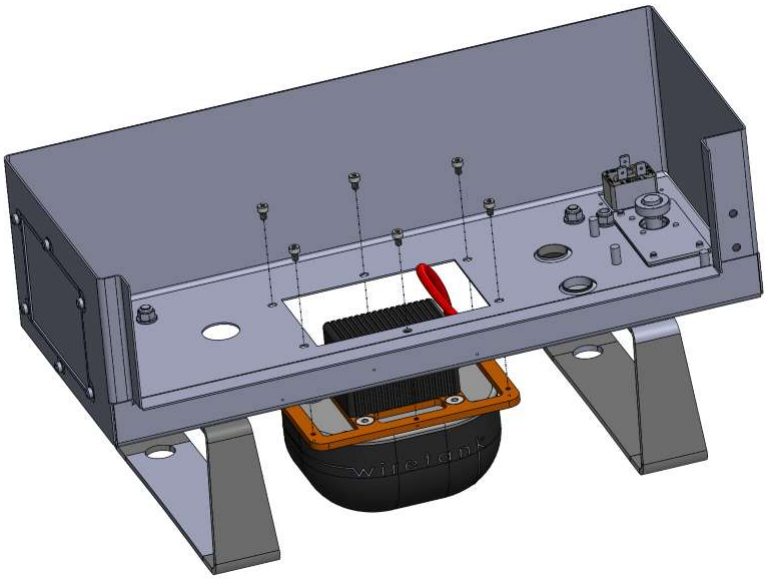

Figure 7 – Mounting Plate to Robot Cabinet Assembly

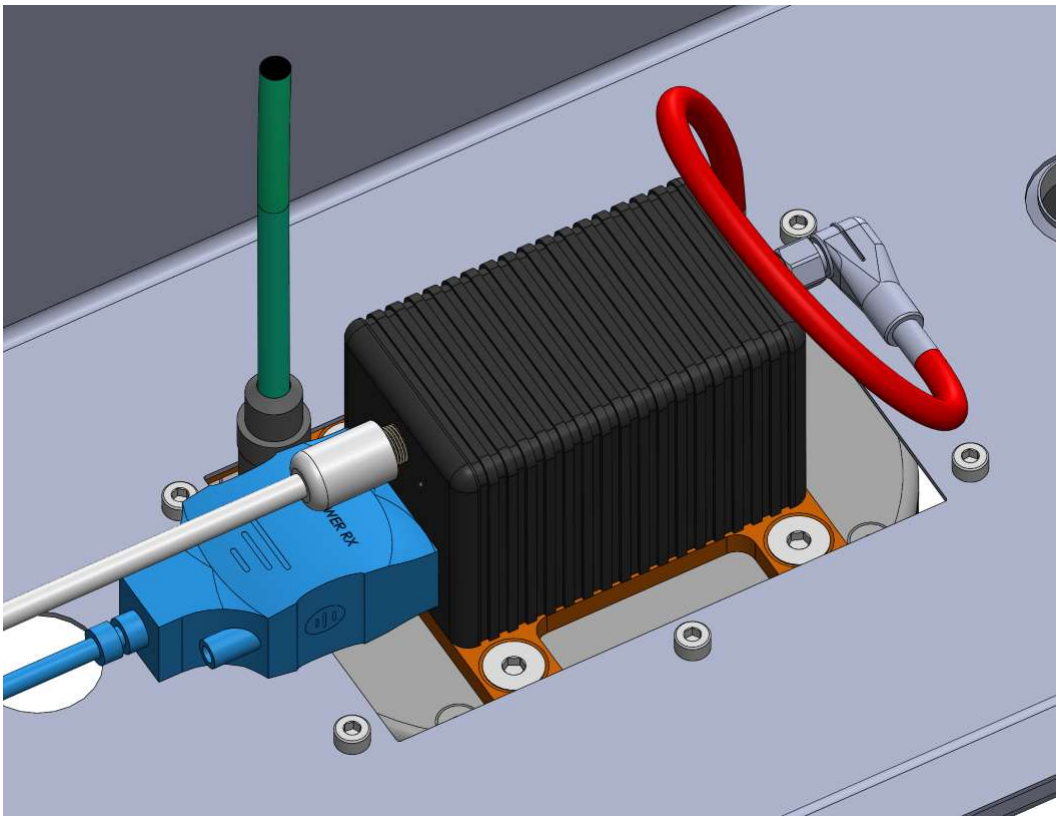

Figure 8 – Completed Cabinet Installation

URCap Installation

After inserting the provided WireTank usbstick into the teach pendant's USB port, the URCap installation can be done by pressing the "Hamburger" menu at the top right of the Polyscope software. Figure 9 below shows the URCap installation screen. Click the "+" button and navigate to the URCap file, WireTankDispenser-3.0.urcap, on the USB stick. A Polyscope restart is required for the URCap installation to complete.

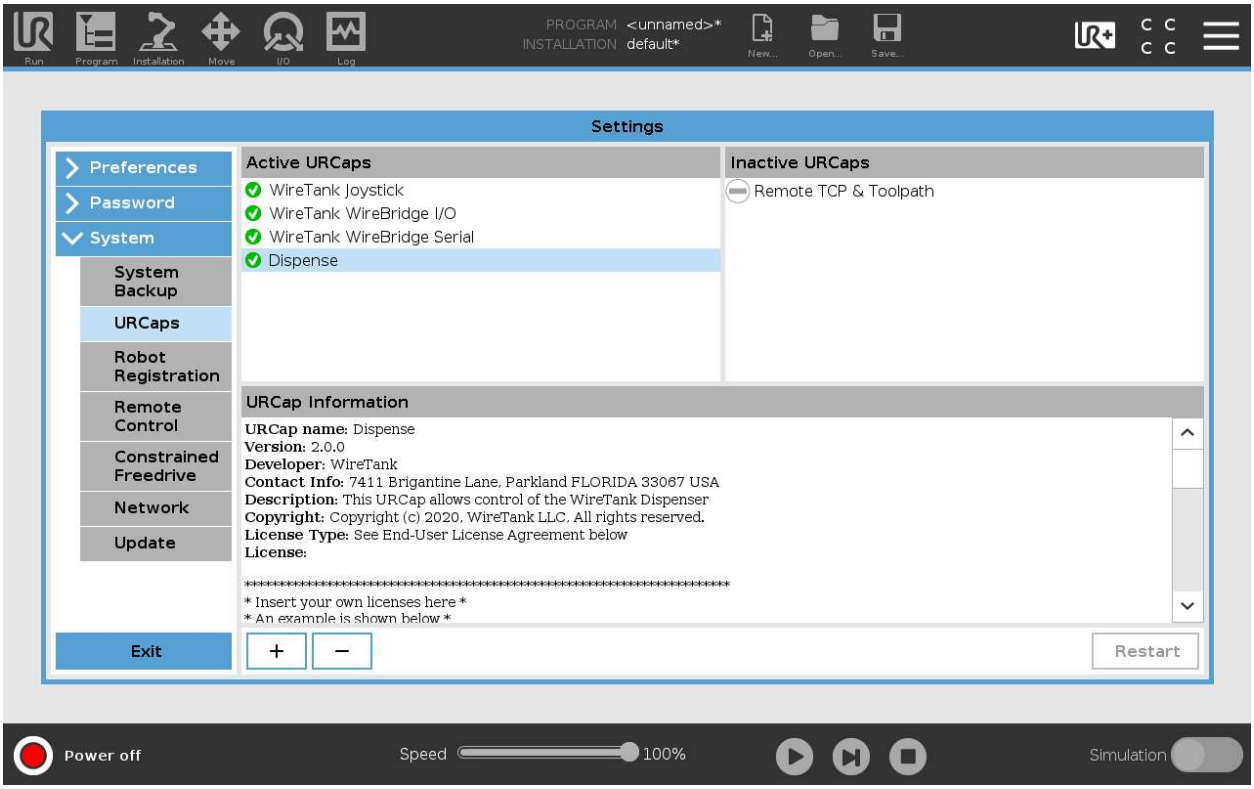

Figure 9 – URCAP Installation

Operation

Installation Node

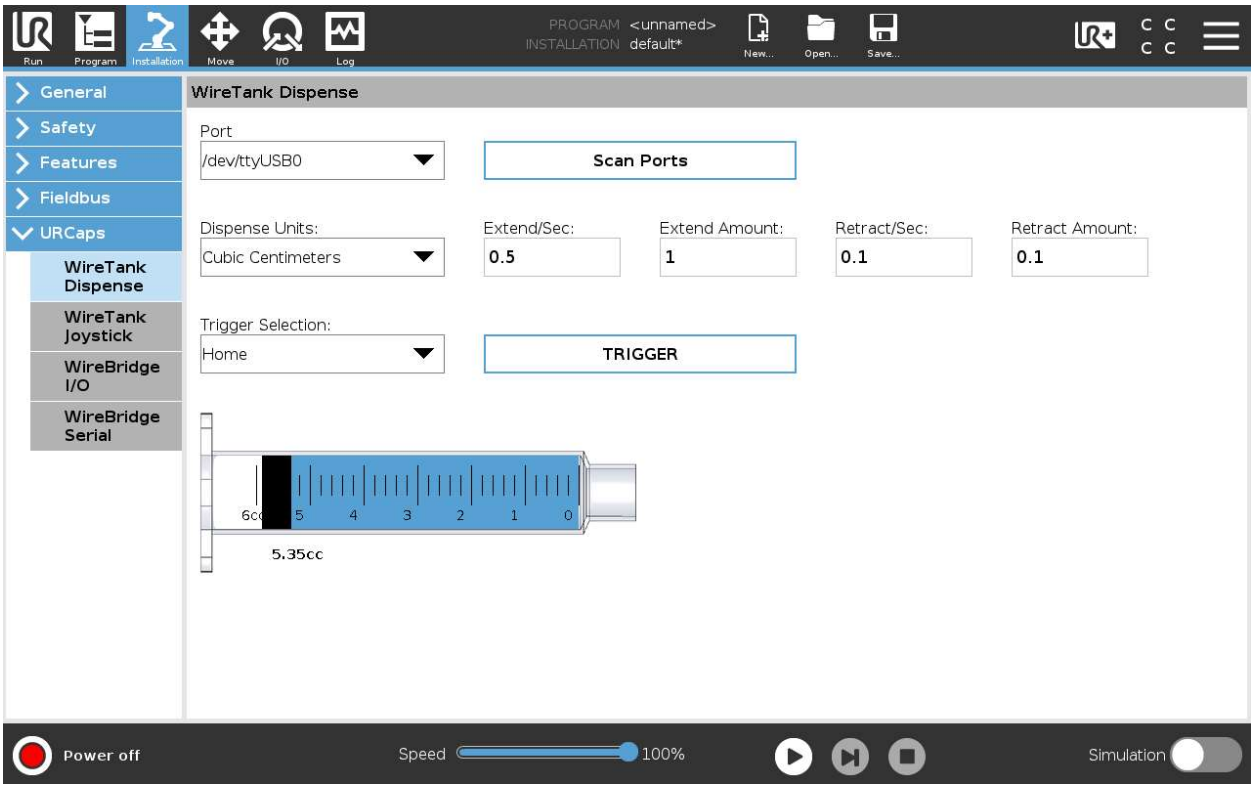

Figure 10 – Installation Node

Port Selection

Depending on the mounting option chosen, a different port will be selected to operate the dispenser. If connected at the tool, "/dev/ttyTool" should be chosen. If connected inside the robot controller cabinet, "/dev/ttyUSB0" should be chosen.

If the port to be used is not listed, click "Scan Ports" to refresh the lists of available ports.

If connected at the tool, the dispenser will not be available until the robot is turned on and the robot status is "Normal". In this case, "Scan Ports" can also be used to reconnect with the dispenser.

Dispense Units

The dispense settings can be configured in both motor steps or in CC's. This can be useful when setting very small dispense amounts as motor steps will be easier to grasp. Toggling the units back and forth will reconvert the settings.

Trigger Types

Before you can operate the dispenser, the gun must be homed so that the controller knows the exact position of the attached gun. This should be done every time the gun is changed or when the system is powered up. The installation node will show a warning if the gun has not been homed since powered up and will set the trigger type to “Home”.

Tip: If the gun must be homed but the syringe has already been filled, the gun can be homed by removing the “Syringe Coupler” and then extending back to position.

1) Home
    a. Homes the gun until the homing switch is reached
2) Extend
    a. Extends the plunger forward towards the tip of the syringe at the defined speed by the “Extend/Sec” field while the “Trigger” button is pressed.
3) Extend Distance
    a. Extends the plunger forward towards the tip of the syringe at the defined speed for the defined amount once the “Trigger” is pressed and resets the trigger once the operation completes
4) Retract
    a. Retracts the plunger away from the tip of the syringe at the defined speed by the “Retract/Sec” field while the “Trigger” button is pressed.
5) Retract Distance
    a. Retracts the plunger away from the tip of the syringe at the defined speed for the defined amount once the “Trigger” is pressed and resets the trigger once the operation completes

Toolbar

The toolbar can be used to trigger the dispenser using the settings of the installation node when using other Polyscope screens. The functionality of the trigger will mimic that of the installation node.

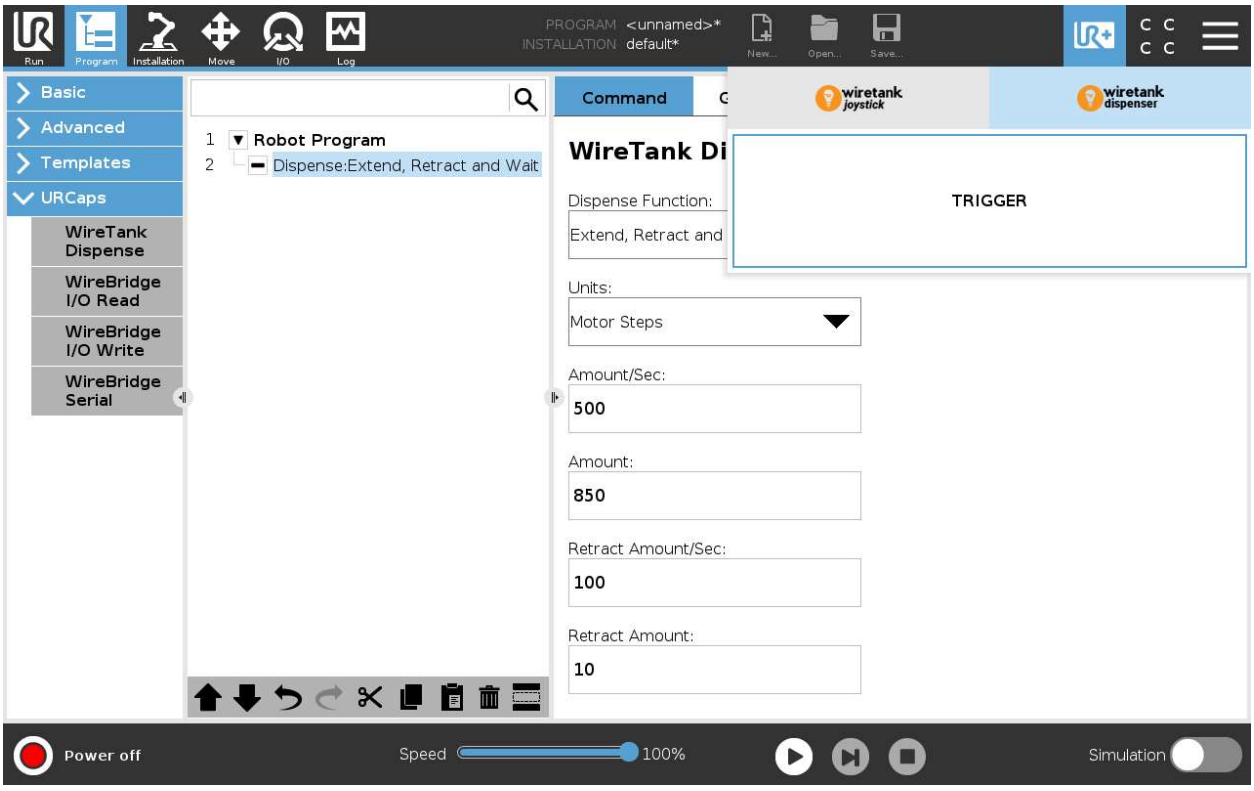

Figure 11 - Toolbar

Program Node

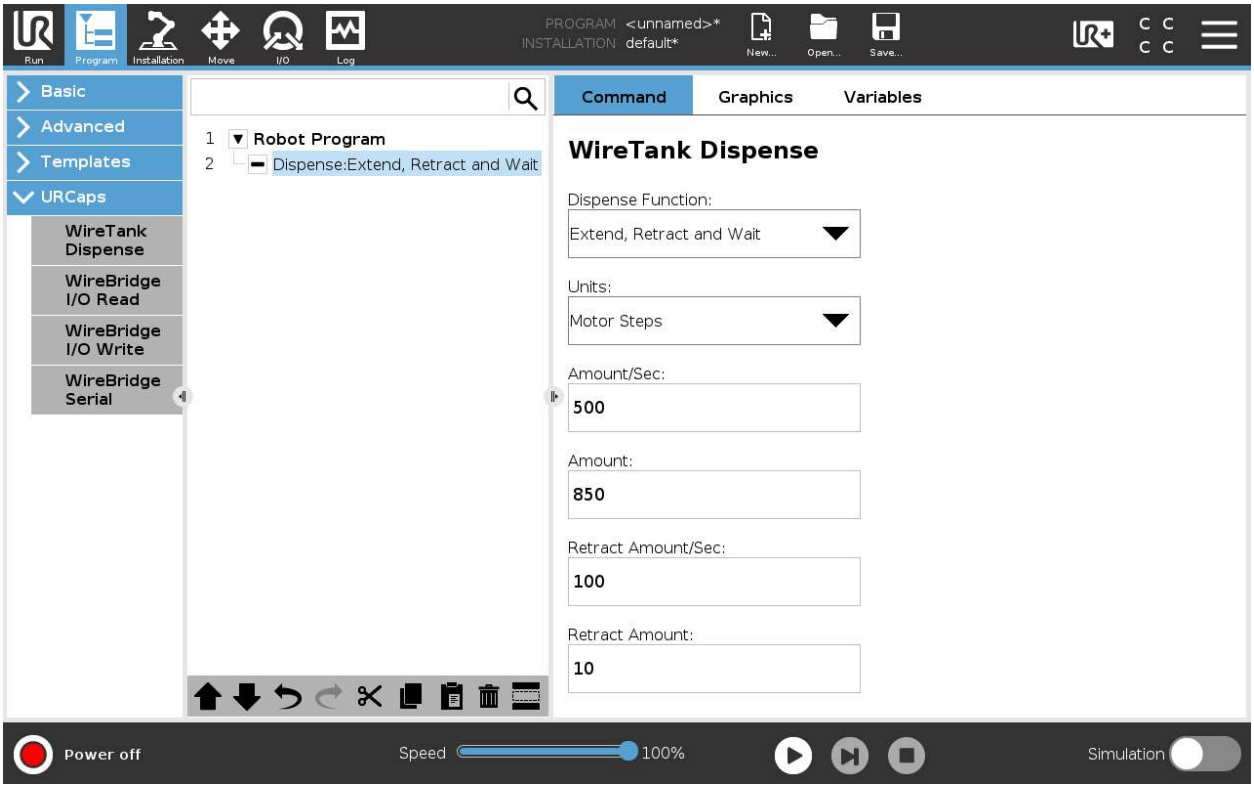

Figure 12 - Program Node

Dispense Functions

1) Home
    a. Homes the dispenser back to the starting position. This is useful in application where
2) Stop
    a. Is used to stop both a previously set “Extend” or “Retract”
3) Extend
    a. Starts extending the plunger of the syringe in the direction of the tip as defined by the “Amount/Sec” field. Program execution continues almost instantaneously.
4) Extend Distance
    a. Starts extending the plunger of the syringe in the direction of the tip as defined by the “Amount/Sec” field for an amount defined by the “Amount” field. Program execution continues almost instantaneously.
5) Extend Distance and Wait
    a. Starts extending the plunger of the syringe in the direction of the tip as defined by the “Amount/Sec” field for an amount defined by the “Amount” field. Program execution will hold until the operation is complete.
6) Retract

a. Same as “Extend” but in the syringe plunger moves in the opposite direction.

7) Retract Distance
   a. Same as “Extend Distance” but the syringe plunger moves in the opposite direction.
8) Retract Distance and Wait
   a. Same as “Extend Distance and Wait” but in the syringe plunger moves in the opposite direction.
9) Extend, Retract and Wait
   a.

Position Variable

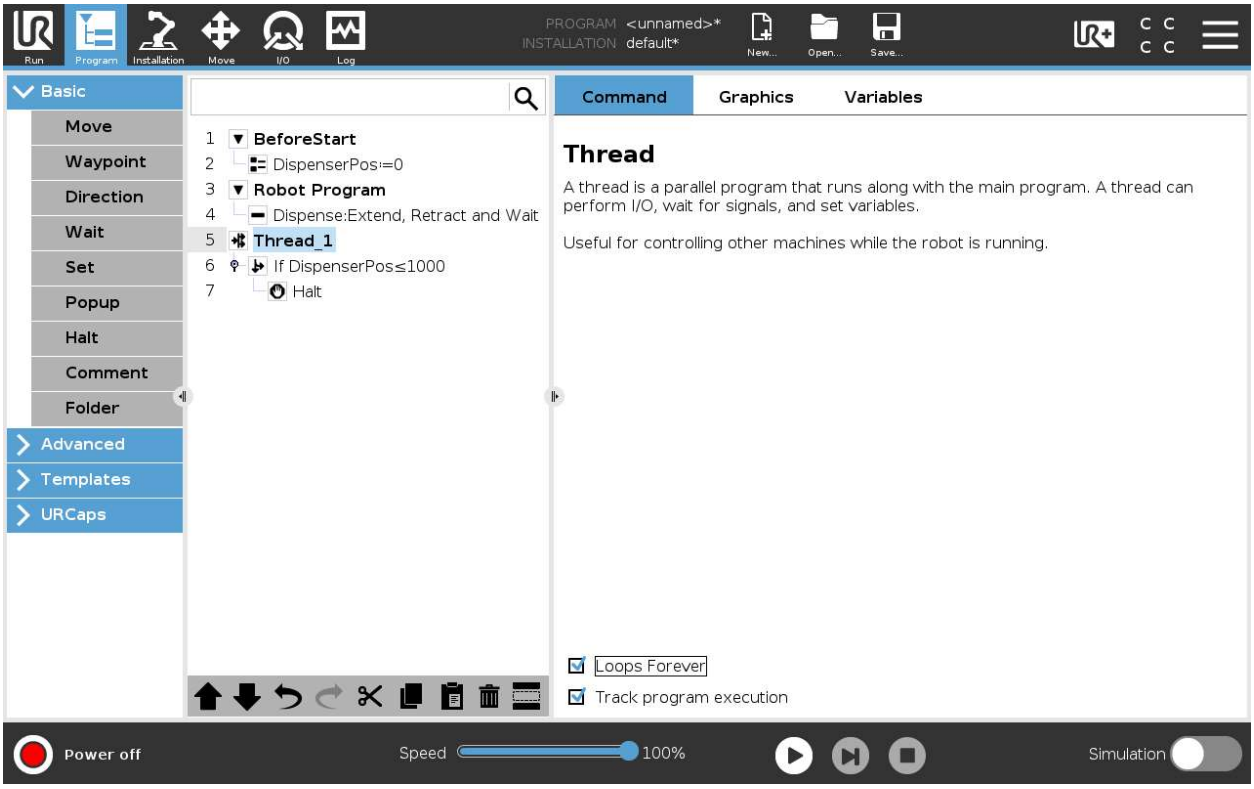

Figure 13 – Thread Monitoring DispenserPos variable

Position Error Codes:

-1000 – No Communication

-2000 – Not Homed

-3000 – End of Travel Reached