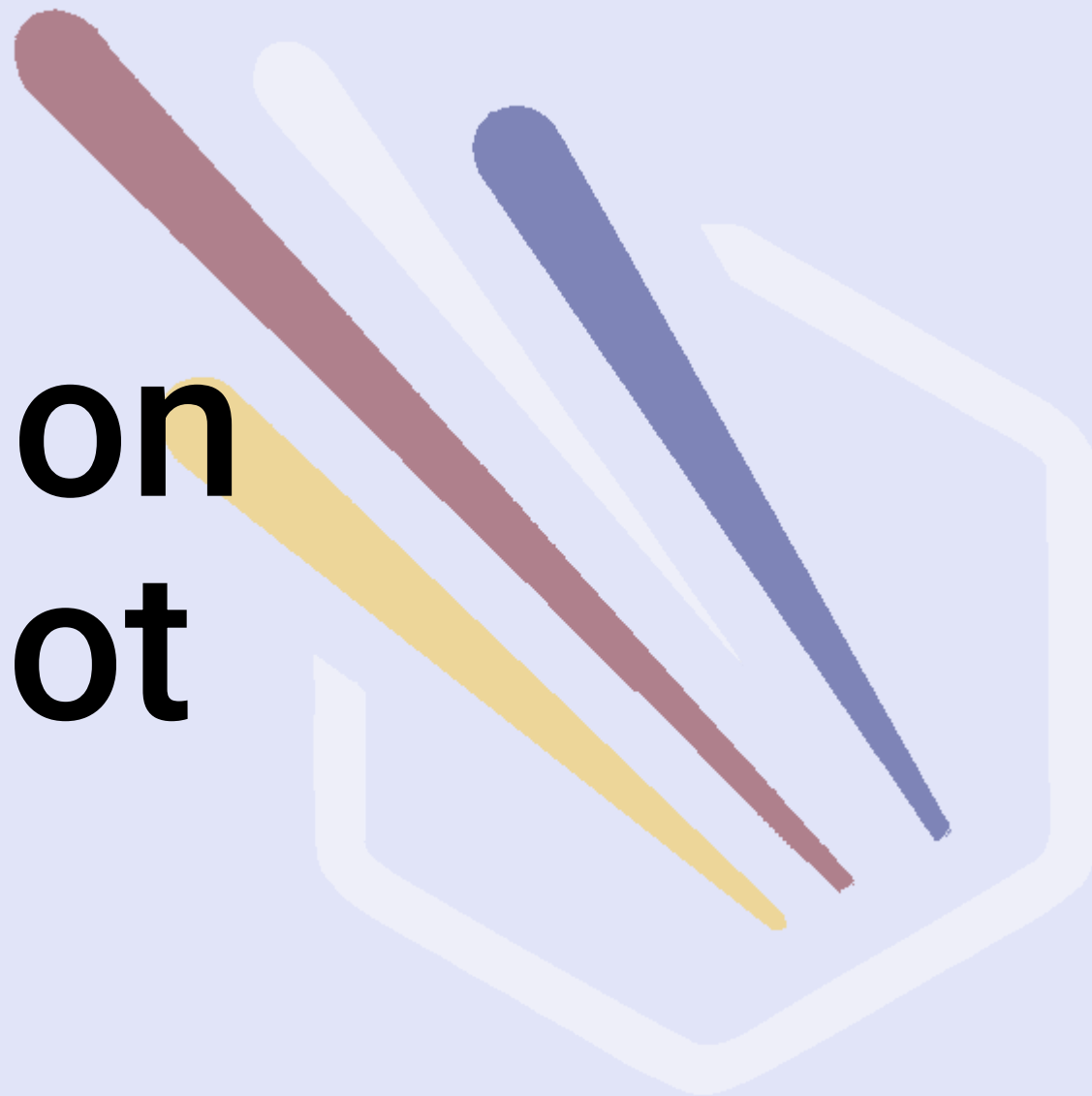
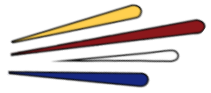


# Presentation of the robot

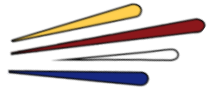
06/08/21



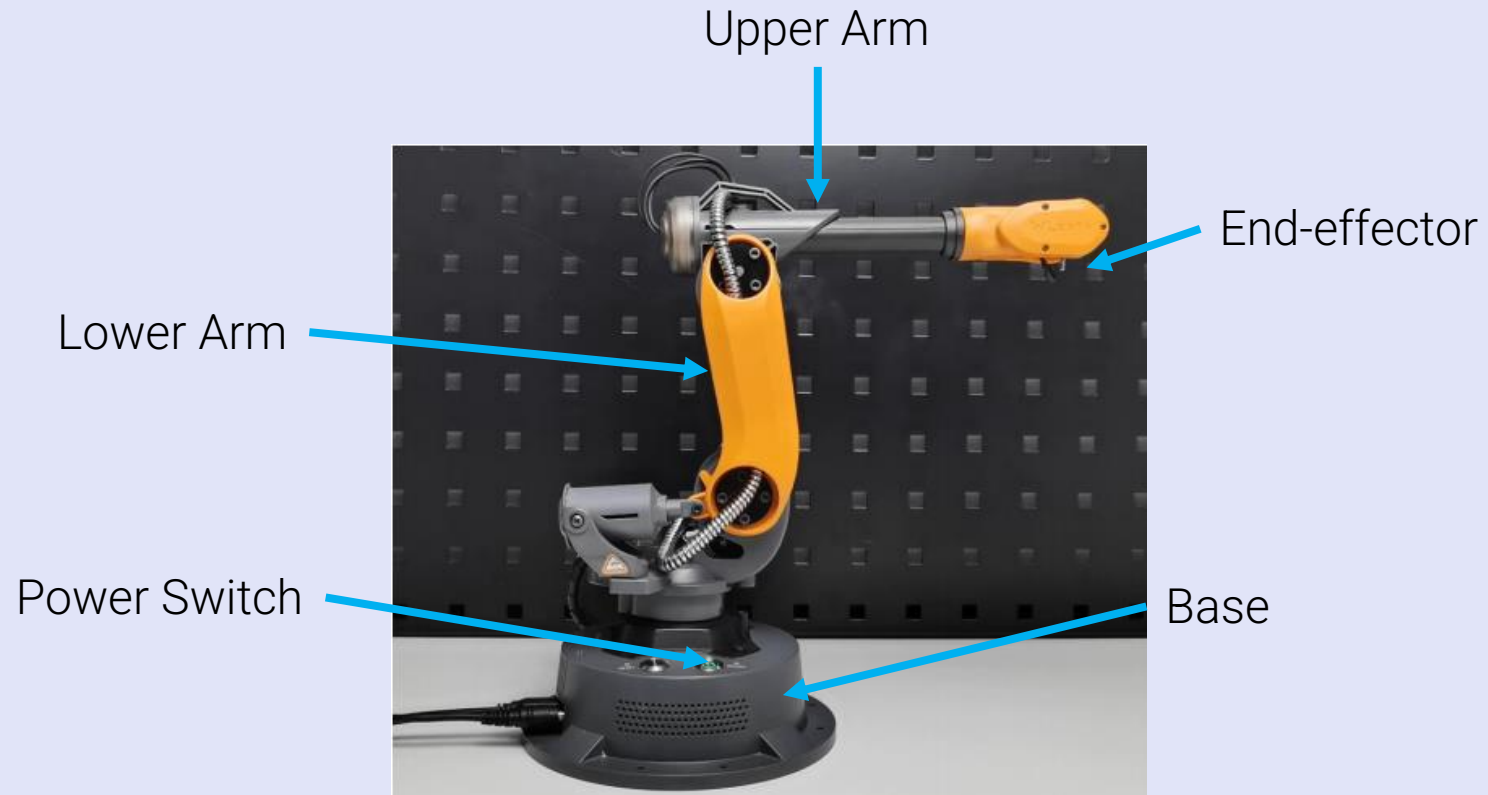


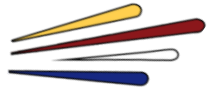
## Summary

1. Presentation of the Mirobot and its equipment
2. How to install the Mirobot and presentation of the software
3. The different coordinate modes
4. The functions of control
5. Using the Pneumatic Unit
6. Using the Sliding Rail
7. Using the Conveyor
8. Bluetooth teach pendant



# 1. Presentation of the Mirobot and its equipment



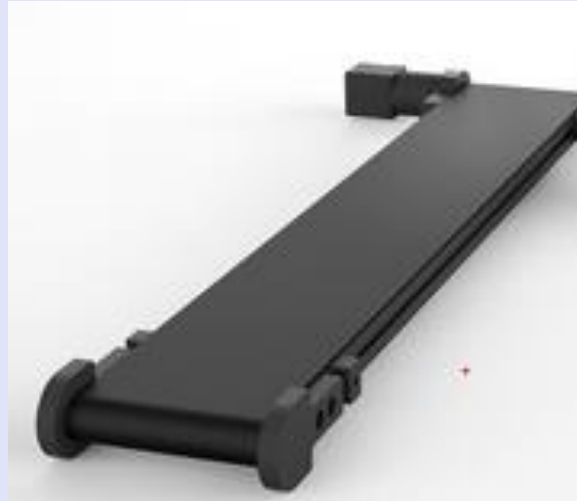


# 1. Presentation of the Mirobot and its equipment

Sliding Rail

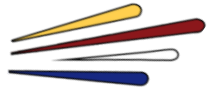


Conveyor



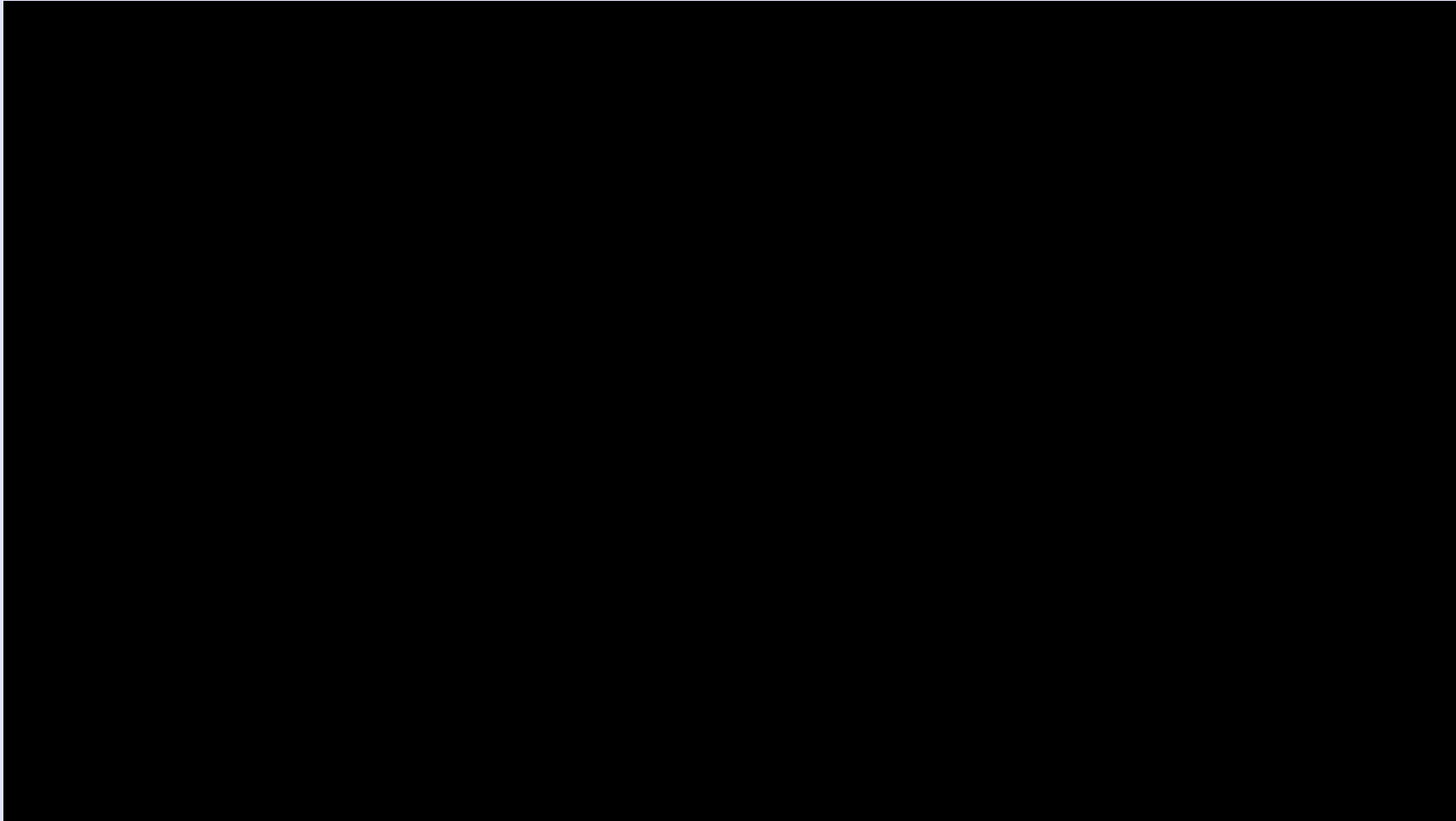
Vision Set

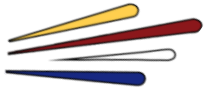




## 2. How to install the Mirobot and presentation of the software

### ➤ Installation of the Mirobot





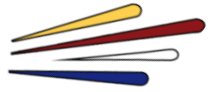
## 2. How to install the Mirobot and presentation of the software

### ➤ The software: Wlkata Studio

The screenshot displays the Wlkata Studio V1.017 interface. A 'Settings' dialog box is open in the center, with a red arrow pointing to the 'Language' dropdown menu, which is currently set to 'English'. The dialog box has three tabs: 'Base', 'Sensor', and 'Tool'. The 'Base' tab is active, showing fields for 'Port' (COM4), 'BaudRate' (115200), and 'Language' (English). Below these are 'Font' (Arial), 'Calibration' (Start, Finsih), 'Device' (pdate Firmwar, Install Drive), and 'Reset' (Reset All Settings) buttons. At the bottom are 'OK' and 'Cancel' buttons.

Other interface elements include:

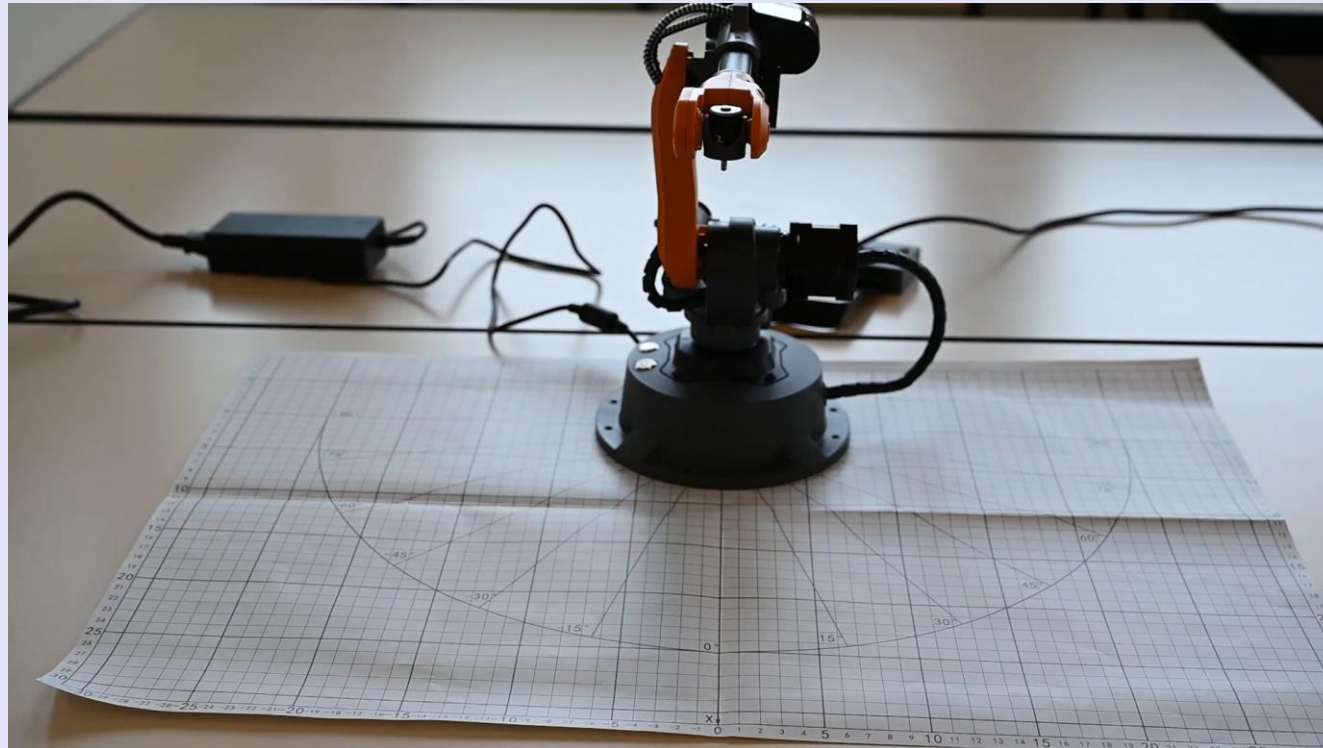
- Top left: 'Mirobot' dropdown menu, 'Firmware 1.0', and 'Com: COM4' dropdown.
- Top right: 'JOINT MODE', 'COORD MODE', 'HOMING', 'ZERO POS', 'STOP', and 'CONTINU' buttons.
- Right side: 'MOTION CONTROL' panel with sliders for J1-J6, Speed, Step, and Slider, and 'END-EFFECTOR CTRL' with a 'SuctionCup' dropdown set to 'ON'.
- Left sidebar: 'OMM', 'TEACHING', 'BLOCKLY', 'DRAWING', 'PYTHON', and 'SETTING' icons.
- Main window: Serial terminal output showing 'Grbl 0.9j' and various coordinate and status messages.

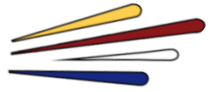


## 2. How to install the Mirobot and presentation of the software

### ➤ HOMING the Mirobot

It's a very important part of the process. It should be done every time the robot is power On or after a failure.

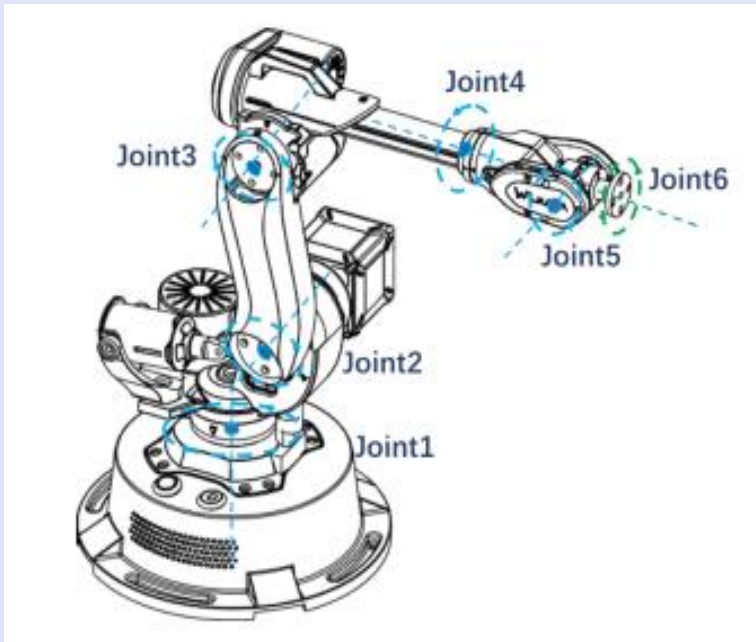




### 3. The different coordinate modes

- 2 coordinate modes exist to move the Mirobot: Joint Mode and Cartesian Mode

#### Joint Mode

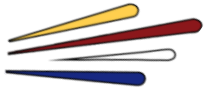


- MOTION CONTROL -

J1:	J1-	J1+	0
J2:	J2-	J2+	0
J3:	J3-	J3+	0
J4:	J4-	J4+	0
J5:	J5-	J5+	0
J6:	J6-	J6+	0

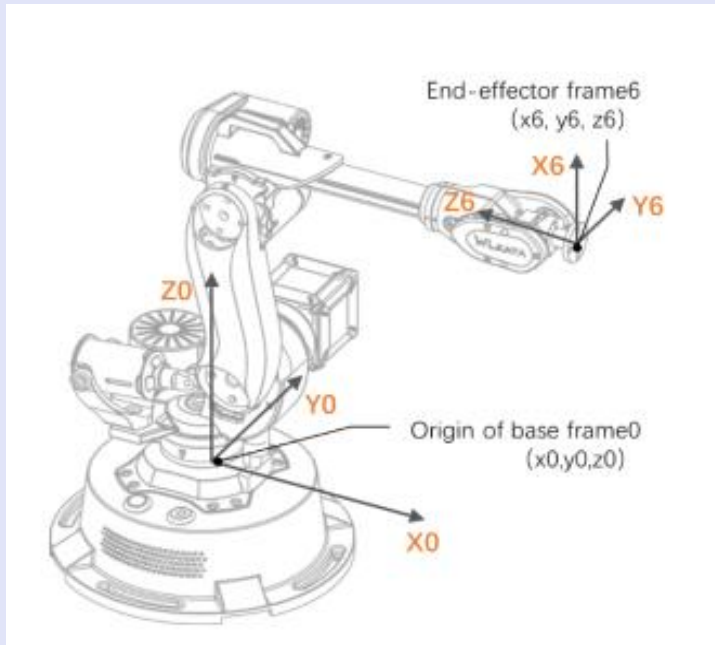
Joints coordinate when the Mirobot is on the "Zero position".





### 3. The different coordinate modes

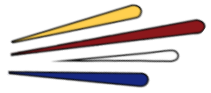
#### Cartesian Mode



- MOTION CONTROL -

X:	X-	X+	198.6
Y:	Y-	Y+	0
Z:	Z-	Z+	195.7
RX:	PX-	PX+	0
RY:	PY-	PY+	0
RZ:	PZ-	PZ+	0

Cartesian coordinates when the Mirobot is on the "Zero position".



## 4. The functions of control

➤ On the software, you can use 4 different functions of control:

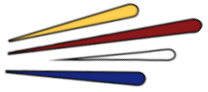
➤ TEACHING

➤ BLOCKLY

➤ DRAWING

➤ PYTHON





## 4. The functions of control: Python

### ➤ Python

#### ▼ Action

- Homing
- Unlock
- Speed of movement
- Zero Position
- Open the suction cup
- Close the suction cup
- Blow the suction cup
- Open the gripper
- Close the gripper
- Slider moveto
- Conveyor move
- Set delay time
- Color sensor identification

#### ▼ Robot Joint Mode

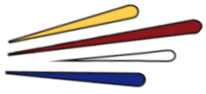
- Send each axis to a specific position
- Increment each axis a specific amount
- Moving axis

#### ▼ Coordinate Mode

- Linear move to a Cartesian position
- Linear increment in Cartesian space
- Directional movement
- Door track movement
- Arc trajectory movement

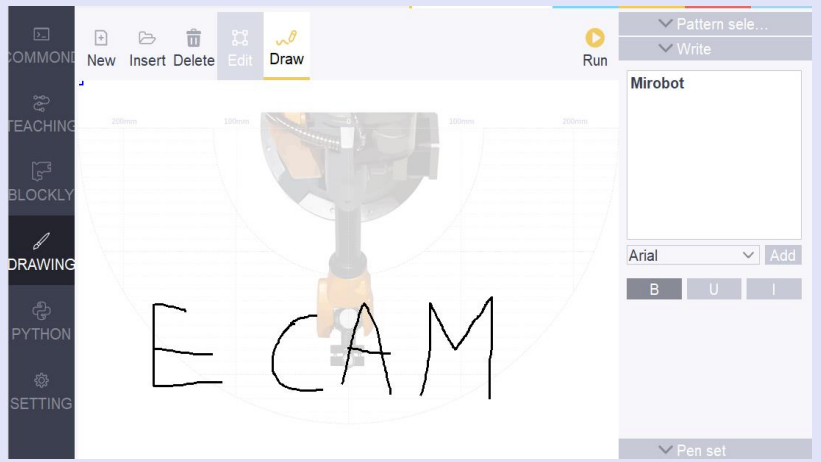
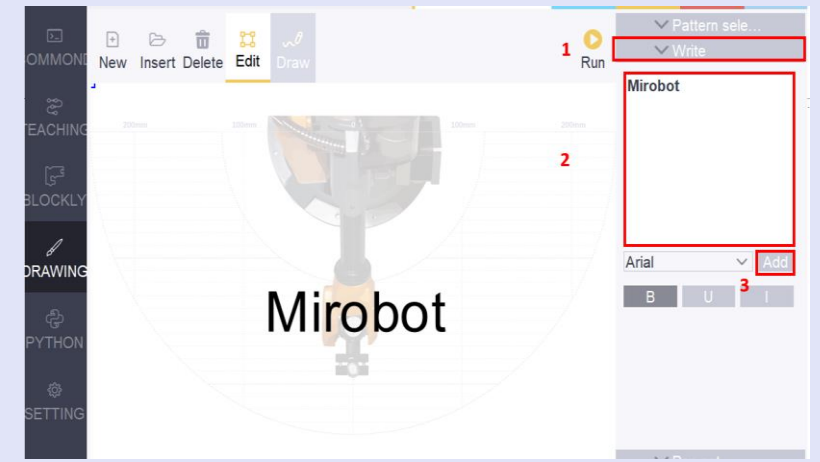
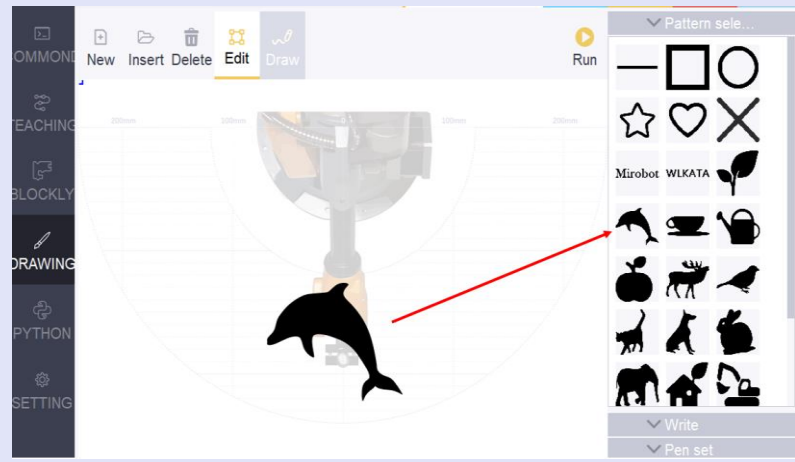
```
1 #version python 3.8
2 #coding=utf-8
3 from mirobot import *
4 from time import sleep
5 api=Mirobot()
6 #Please do not delete the above code
7 api.home_simultaneous()
8 sleep(15)
```

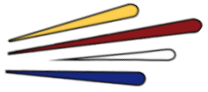
!!! Never delete the first 8 lines !!!



# 4. The functions of control: DRAWING

## ➤ DRAWING



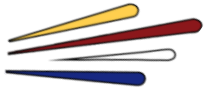


## 4. The functions of control: TEACHING

### ➤ TEACHING

You can control the robot by adding the different position of the Mirobot one after the other.

The screenshot displays the WLKATA Studio V1.017 interface. The top bar shows 'Mirobot' and 'UNCONNECTED | Firmware 1.0 | Com:'. The main workspace is currently empty. On the left sidebar, the 'TEACHING' mode is selected and highlighted with a red box. The right sidebar contains 'MOTION CONTROL' settings for X, Y, Z, RX, RY, RZ axes, Speed, Step, and Slider, along with 'END-EFFECTOR CTRL' settings for SuctionCup and Pen. The bottom status bar includes 'Delete', 'Up', 'Down', 'Undo', 'Redo', 'Copy', and 'Paste' icons.



## 4. The functions of control: TEACHING

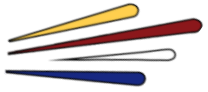
The two coordinate modes can be used with their function but when you begin to add position or run the program, **DO NOT Change the control mode or the point data after switching the mode, it would be discordant and cause illegal motion.**



	Motion	Name	J1/X	J2/Y	J3/Z	J4/RX	J5/RX	J6/RZ	Speed	Pause
1	MOVL		0.0	0.0	0.0	0.0	0.0	0.0	2000.0	100.0
2	MOVJ		<i>0.0</i>	<i>0.0</i>	<i>0.0</i>	<i>0.0</i>	<i>0.0</i>	<i>0.0</i>	<i>2000.0</i>	<i>100.0</i>

Line 1: Joint Mode

Line 2: Cartesian Mode → *Appears in Italic*



## 4. The functions of control: TEACHING

Add a new position

	Motion	Name	J1/X	J2/Y	J3/Z	J4/RX	J5/RY	J6/RZ	Speed	Pause	Trigger	Value
1	MOVL		0.0	0.0	0.0	0.0	0.0	0.0	2000.0	100.0	None	N
2	MOVL		40.0	20.0	-10.0	0.0	0.0	0.0	2000.0	100.0	None	N

1-100 Repeat Run Step Add Update

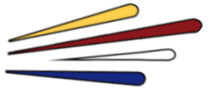
- MOTION CONTROL -

J1:	J1-	J1+	40
J2:	J2-	J2+	20
J3:	J3-	J3+	-10
J4:	J4-	J4+	0
J5:	J5-	J5+	0
J6:	J6-	J6+	0

Change the value of one of the Joint/axis

	Motion	Name	J1/X	J2/Y	J3/Z
1	MOVL		0.0	0.0	0.0
2	MOVL		40.0	20.0	-10.0

	Motion	Name	J1/X	J2/Y	J3/Z
1	MOVL		0.0	0.0	0.0
2	MOVL		40.0	5.0	-10.0



## 4. The functions of control: TEACHING

Change the value of one of the Joint/axis by updating

Motion	Name	J1/X	J2/Y	J3/Z	J4/RX
1	MOVL	0.0	0.0	0.0	0.0
2	MOVL	40.0	20.0	-10.0	0.0

Basic functions on TEACHING

WlKATA Studio V1.017

Mirobot

UNCONNECTED | Firmware 1.0 | Com: |

New Open Save SaveAs

Motion	Name	J1/X	J2/Y	J3/Z	J4/RX	J5/RX	J6/RZ	Speed	Pause	Trigger	Value
1	MOVL	0.0	0.0	0.0	0.0	0.0	0.0	2000.0	100.0	None	N
2	MOVJ	0.0	0.0	0.0	0.0	0.0	0.0	2000.0	100.0	None	N

Repeat Run Step Add Update

J1: J1- J1+ 40

J2: J2- J2+ 5

JOINT MODE

COORD MODE

HOMING ZERO POS STOP CONTINUE

Speed: 500 2000 2000

Step: 1 5 10 15 5

Slider: -100 +100 0

END-EFFECTOR CTRL

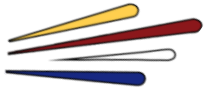
SuctionCup ON

Pen: Set Pen Height

Delete Up Down Undo Redo Copy Paste



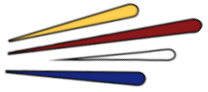




# 4. The functions of control: TEACHING

Example:  
With the  
Cartesian  
Mode

The screenshot displays the WLKATA Studio V1.017 interface. At the top, it shows 'Mirobot' connected with 'Firmware 1.0' and 'Com: COM4'. The 'JOINT MODE' is selected, and the 'COORD MODE' is set to Cartesian. The 'MOTION CONTROL' panel on the right includes controls for joints J1 through J6, with 'J3/X' selected in the table below. The table has columns for Motion, Name, J1/X, J2/Y, J3/X, J4/RX, J5/RX, J6/RZ, Speed, Pause, Trigger, and Value. The 'SuctionCup' is set to 'OFF'. The bottom of the screen shows a Windows taskbar with the time 11:10 and date 03/06/2021.



## 4. The functions of control: BLOCKY

### ➤ BLOCKY

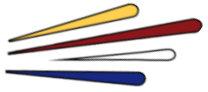
BLOCKY is an open-source graphical programming platform created by Google, which is easy to be learnt and applied by starters

The screenshot displays the Blockly IDE interface. On the left, a sidebar contains a menu with categories: Motion, Parts, Logic, Loops, Math, Text, and Variables. A red box highlights this menu, with a red number '1' below it. The main workspace contains a script starting with a 'Reset' block, followed by a 'repeat 10 times' loop containing a 'do' block with a 'Zero position' block and a 'MOVJ' block. The 'MOVJ' block is configured with 'absolute\_location' set to X: 0, Y: 0, Z: 0 and orientation: A: 0, B: 0, C: 0. A blue number '2' is placed in the workspace below the script. On the right, a yellow box highlights the Python code generated from the script: 

```
from mirobot import *
api=Mirobot()

api.home_simultaneous()
for count in range(10):
    api.go_to_zero()
    api.go_to_cartesian_lin(Motion.MOVJ, 0,0,0,0,0,0)
```

 Below the code, the text 'blockly code, single step python script' is visible. At the bottom right, a yellow number '3' is placed near the text 'Open file complete'.



## 4. The functions of control: BLOCKY

**Motion**

- Reset
- Zero position
- Speed of movement: 1500
- Delay time: 1 second
- MOVJ Move to absolute location : X 0 Y 0 Z 0 orientation: A 0 B 0 C 0
- Y+ move 0
- Rotation Angle absolute location base 0 shoulder 0 elbow 0 roll 0 pitch 0 yaw 0
- Turn base clockwise to 0
- Arc trajectory movement: relative location clockwise X 0 Y 0 Z 0 R 60
- Toward 90° direction move 0

**Motion**

- SuctionCup On

**Parts**

- Gripper On

**Logic**

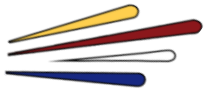
- Slider move to: D 0 F 1500

**Text**

- Conveyor move: relative location D 0 F 1500

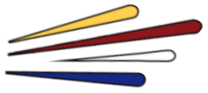
**Variables**

- Color sensor recognition: Red



## 4. The functions of control: BLOCKY

The image displays two panels from the Scratch programming environment, illustrating control functions. The left panel shows the 'Logic' category with the following blocks: 'if do', an equals sign comparison block, an 'and' logical operator block, 'not', 'true', 'null', and a 'test if true if false' block. The right panel shows the 'Loops' category with the following blocks: 'repeat 10 times do', 'repeat while do', 'count with i from 1 to 10 by 1 do', 'for each item i in list do', and 'break out of loop'.



## 4. The functions of control: BLOCKY

To move the Mirobot:

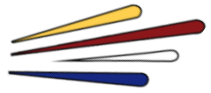
### ➤ With the Cartesian Mode

```
api.go_to_cartesian_lin(Motion.MOVJ, 0 ,0 ,0 ,0 ,0 ,0)
```

What is the difference between the absolute and the relative position?

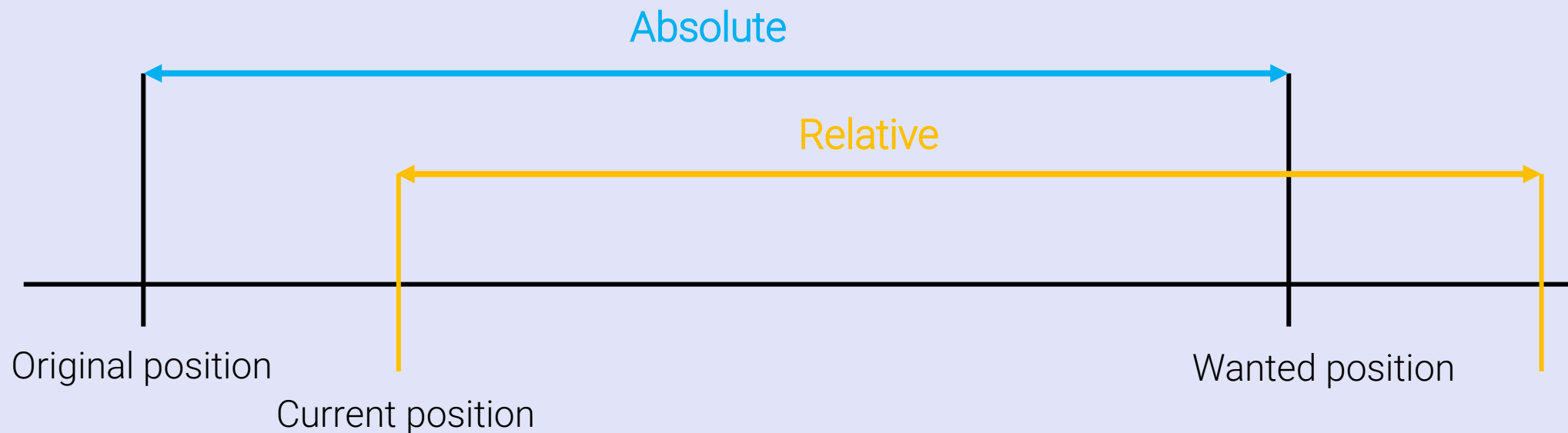
### ➤ With the Joint Mode

```
api.go_to_axis(0 ,0 ,0 ,0 ,0 ,0)
```

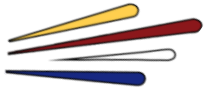


## 4. The functions of control: BLOCKY

- The absolute position corresponds to a distance travelled from the original position
- The relative position is the distance travelled depending on the current position.





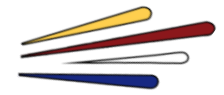


## 4. The functions of control: BLOCKY

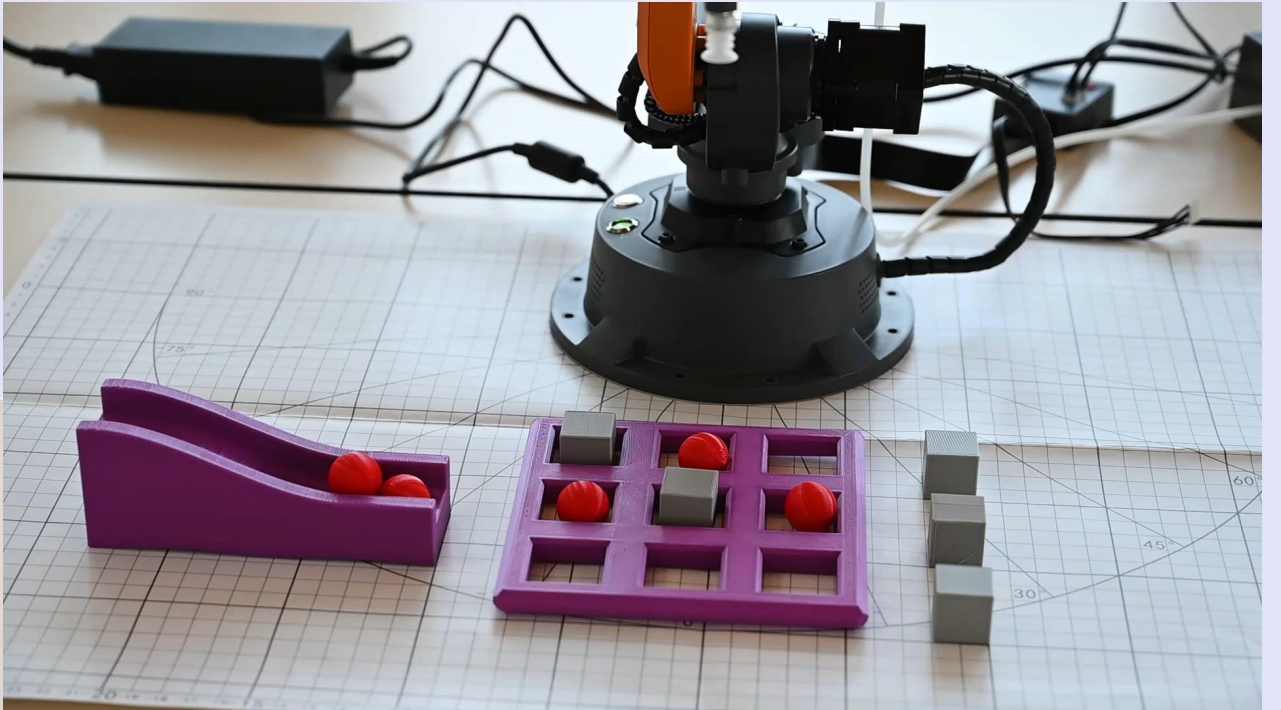
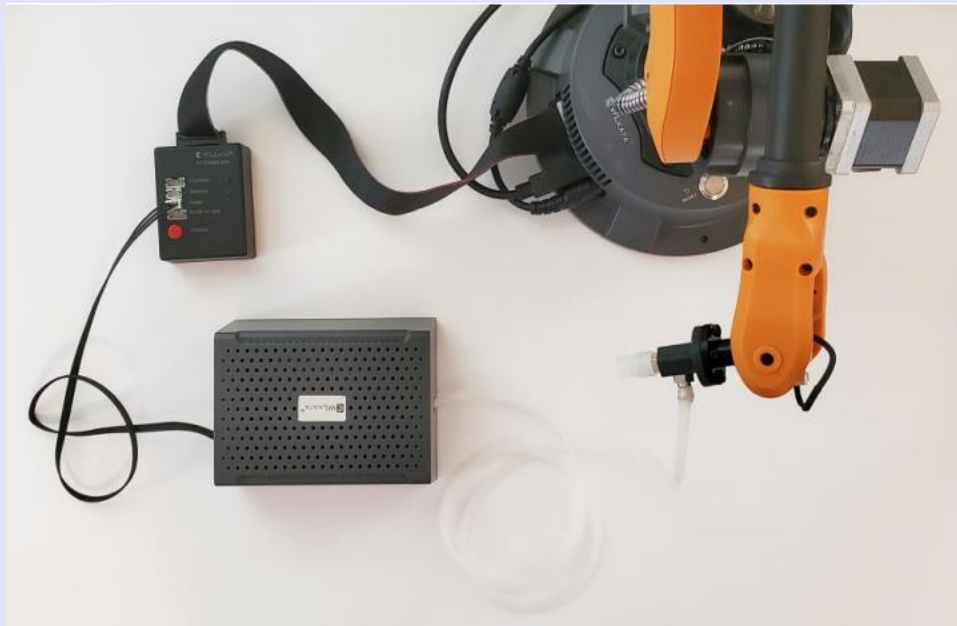
The screenshot displays the WLKATA Studio V1.017 interface. At the top, it shows 'Mirobot' connected with 'Firmware 1.0' and 'Com: COM4'. The main workspace is a grid for 'blockly code, python script to run'. On the right, the 'MOTION CONTROL' panel is visible, showing coordinates for X, Y, Z, RX, RY, and RZ, along with speed and step settings. Below this, the 'END-EFFECTOR CTRL' section shows 'SuctionCup' set to 'ON'. An inset image in the bottom right shows a physical robot arm with an orange gripper on a table with a grid paper.

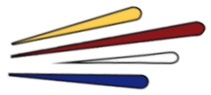
Example:  
With the  
Cartesian  
Mode





## 5. Using the Pneumatic Unit





## 5. Using the Pneumatic Unit

- 3 End-Effector:

Suction Cup

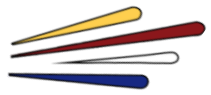


2 Finger Gripper



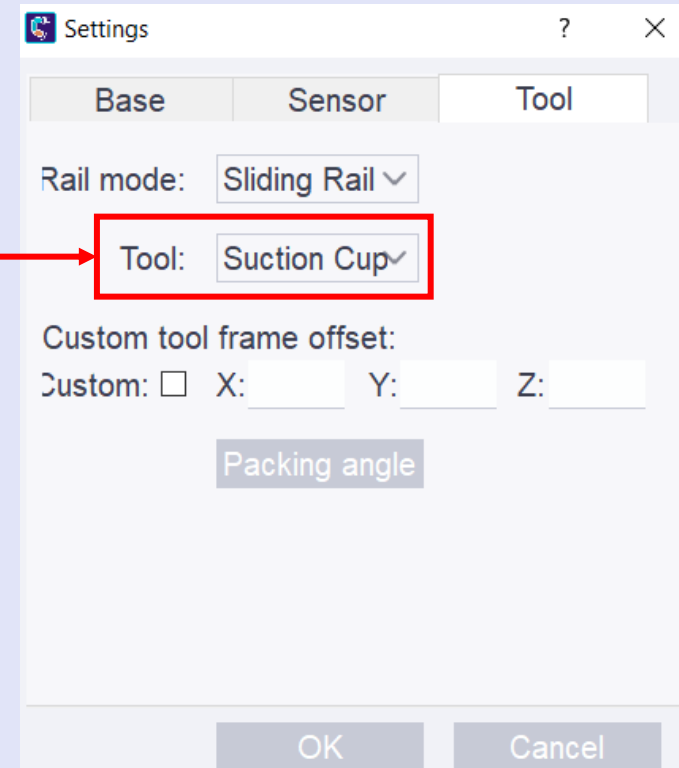
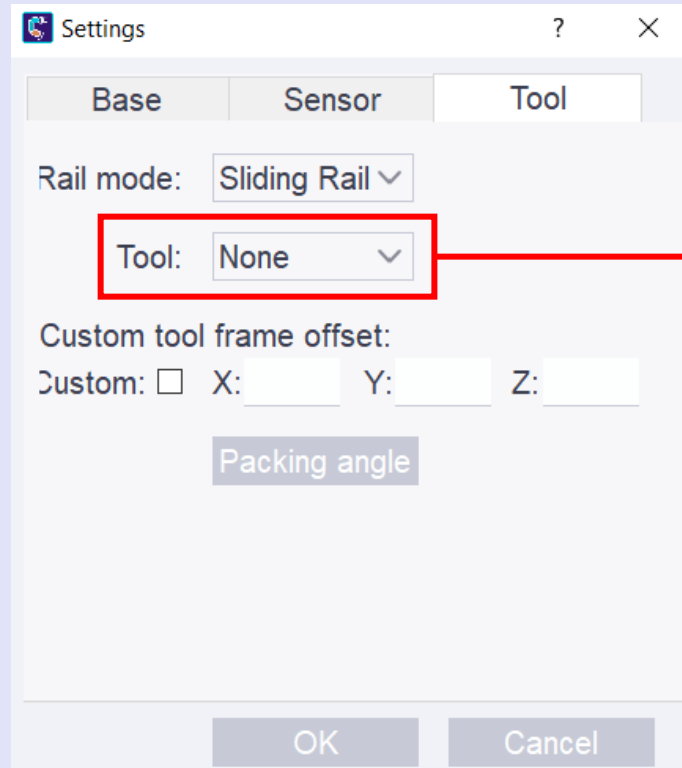
3 Finger soft claw

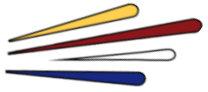




## 5. Using the Pneumatic Unit

Parameter the Mirobot to use the Pneumatic unit





## 5. Using the Pneumatic Unit

➤ With the TEACHING function

J4/RX	J5/RY	J6/RZ	Speed	Pause	Trigger	Value	Accessory
0.0	0.0	0.0	2000.0	100.0	None		None

J4/RX	J5/RY	J6/RZ	Speed	Pause	Trigger	Value	Accessory
0.0	0.0	0.0	2000.0	100.0	SuctionCup	On	None

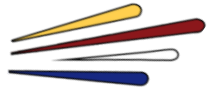
➤ With the BLOCKY function

Motion  
Parts  
Logic  
Loops  
Math  
Text  
Variables

- SuctionCup On
- Gripper On
- Slider move to: D 0 F 1500
- Conveyor move: relative location D 0 F 1500
- Color sensor recognition: Red

SuctionCup On

- ✓ On
- Off
- Blow



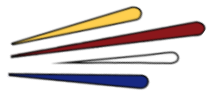
## 5. Using the Pneumatic Unit

On



Off





## 5. Using the Pneumatic Unit

➤ Particularity of the 3 Finger soft claw

On

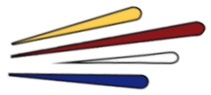


Off







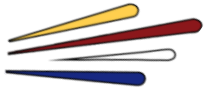


## 5. Using the Pneumatic Unit

Same program as before but with the BLOCKY function in the Cartesian mode.

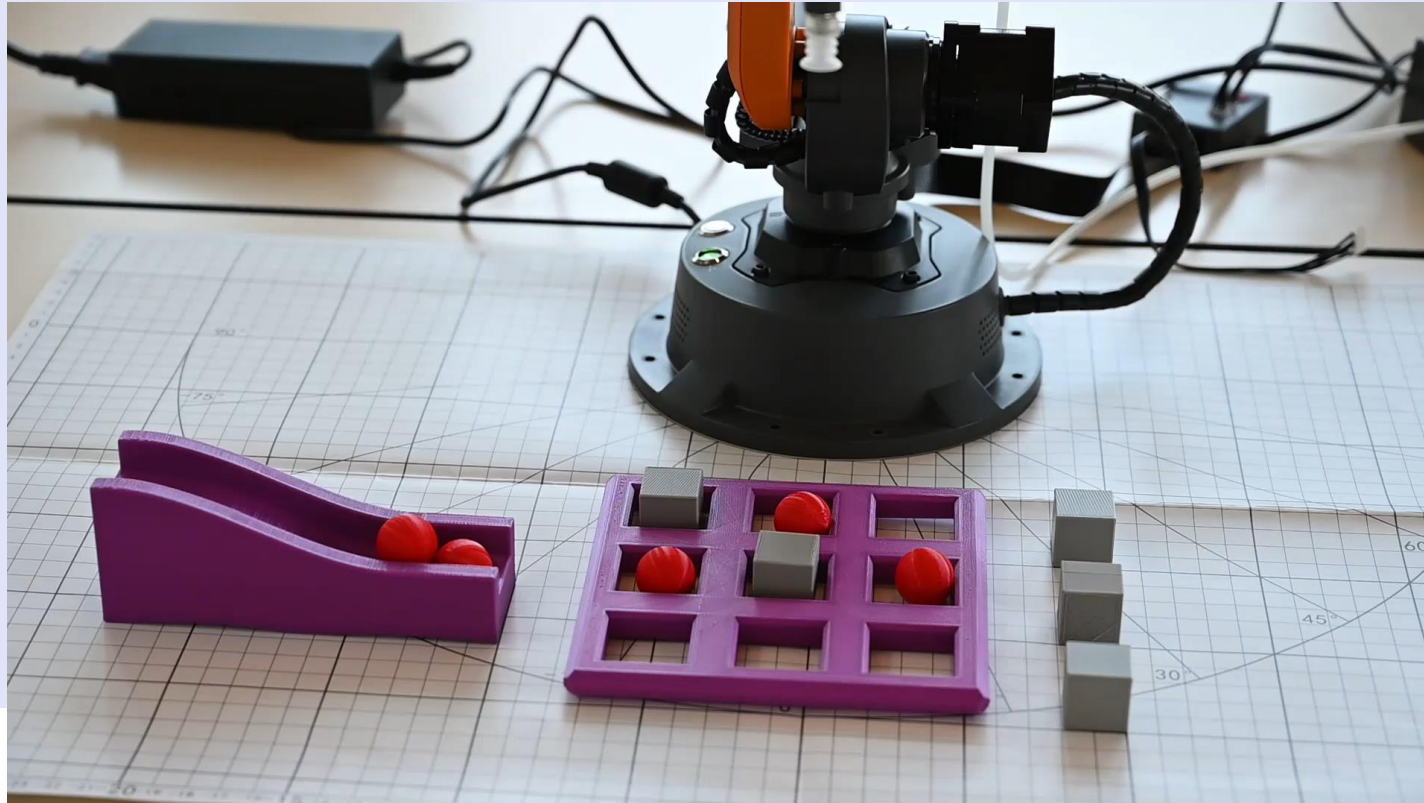
```
Zero position
MOVJ Move to absolute_location : X 197.6 Y -114 Z 25.7 orientation: A 0 B 0 C 0
SuctionCup On
MOVJ Move to absolute_location : X 232.6 Y 0 Z 164.7 orientation: A 0 B 0 C 0
MOVJ Move to absolute_location : X 232.6 Y 0 Z 19.7 orientation: A 0 B 0 C 0
SuctionCup Off
Zero position
```

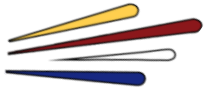




## 5. Using the Pneumatic Unit

	Motion	Name	J1/X	J2/Y	J3/Z	J4/RX	J5/RY	J6/RZ	Speed	Pause	Trigger	Value
1	MOVL		0.0	0.0	0.0	0.0	0.0	0.0	2000.0	100.0	None	
2	MOVL		15.0	59.0	-8.0	-1.0	-50.0	0.0	2000.0	100.0	SuctionCup	On
3	MOVL		7.0	26.0	2.0	-1.0	-50.0	0.0	2000.0	100.0	SuctionCup	On
4	MOVL		8.0	43.0	5.0	-9.0	-54.0	12.0	2000.0	100.0	SuctionCup	On
5	MOVL		8.0	43.0	5.0	-9.0	-54.0	12.0	2000.0	100.0	SuctionCup	Off
6	MOVL		0.0	0.0	0.0	0.0	0.0	0.0	2000.0	100.0	None	



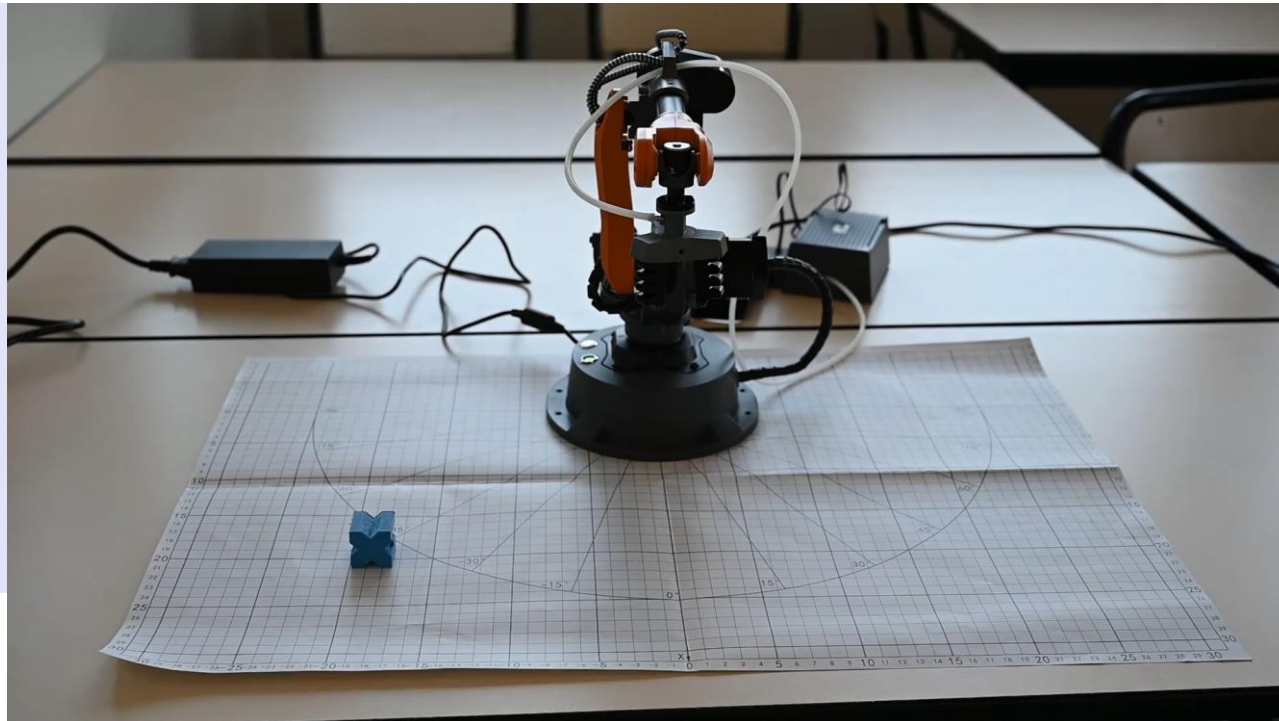


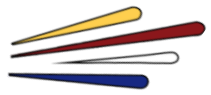
## 5. Using the Pneumatic Unit

	Name	J1/X	J2/Y	J3/Z	J4/RX	J5/RX	J6/RZ	Speed	Pause	Trigger	Value
1		0.0	0.0	0.0	0.0	0.0	0.0	2000.0	100.0	SuctionCup	On
2		-29.0	60.0	-15.0	0.0	-42.0	0.0	2000.0	100.0	SuctionCup	On
3		-29.0	60.0	-15.0	0.0	-42.0	0.0	2000.0	100.0	SuctionCup	Off
4		-29.0	25.0	-15.0	0.0	-42.0	0.0	2000.0	100.0	None	
5		0.0	60.0	-15.0	0.0	-42.0	0.0	2000.0	100.0	SuctionCup	Off
6		0.0	60.0	-15.0	0.0	-42.0	0.0	2000.0	100.0	SuctionCup	On
7		0.0	0.0	0.0	0.0	0.0	0.0	2000.0	100.0	SuctionCup	On
8		0.0	0.0	0.0	0.0	0.0	0.0	2000.0	100.0	SuctionCup	Off

Example:

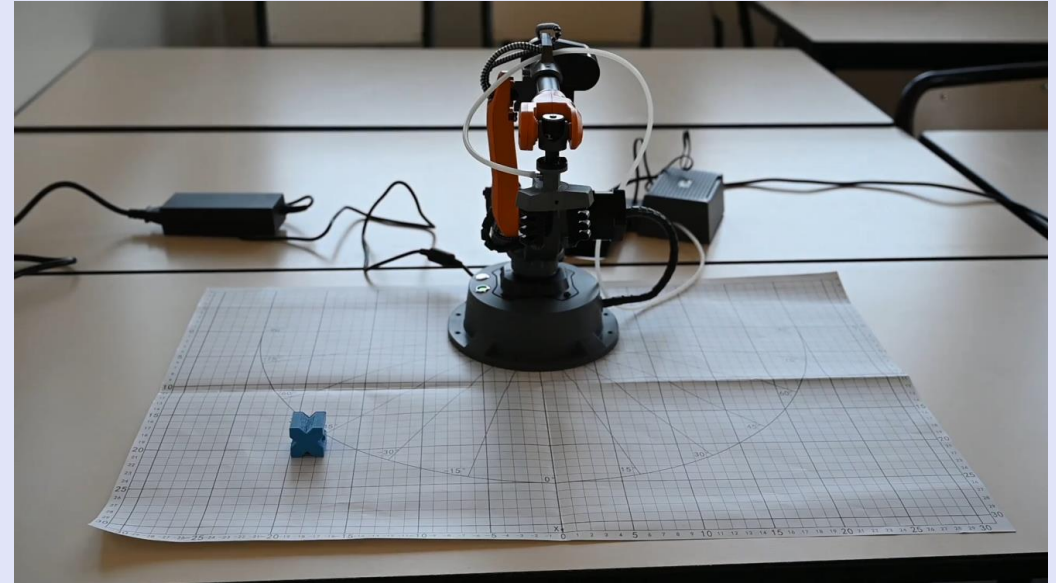
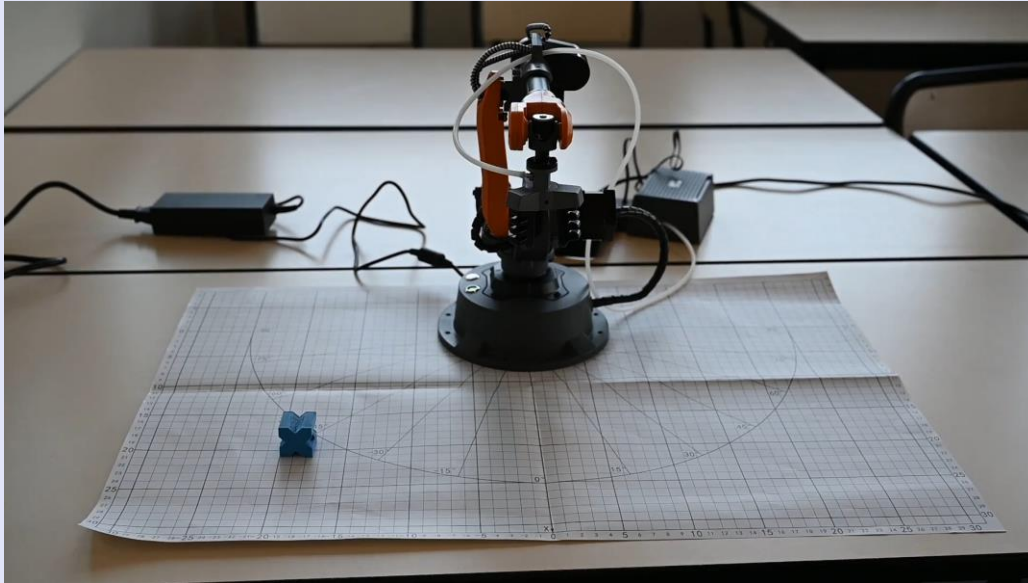
With the 3 Finger  
soft-claw

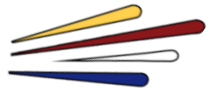




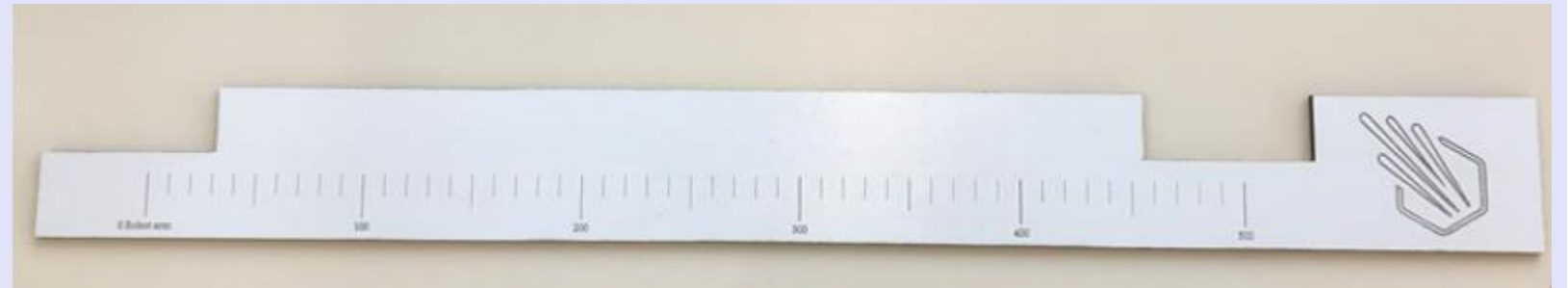
## 5. Using the Pneumatic Unit

- Always raise the robot arm when it moves a piece



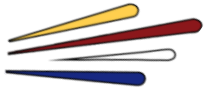


## 6. Using the Sliding Rail



The measuring rule is here to help you when you choose the position of the Sliding Rail





## 6. Using the Sliding Rail

Settings ? X

Base Sensor Tool

Rail mode: Sliding Rail ▾

Tool: None ▾

Custom tool frame offset:  
Custom:  X:  Y:  Z:

Packing angle

OK Cancel

- MOTION CONTROL -

J1: J1- J1+ 0

J2: J2- J2+ 15

J3: J3- J3+ 0

J4: J4- J4+ 10

J5: J5- J5+ 0

J6: J6- J6+ 15

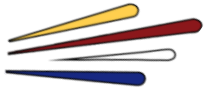
Speed: 500 2000 2000

Step: 1 5 10 15 5

Slider: -100 +100 0

END-EFFECTOR CTRL

SuctionCup ▾ ON ▾



## 6. Using the Sliding Rail

Settings ? X

Base Sensor Tool

Rail mode: Sliding Rail

Tool: None

Custom tool frame offset:  
Custom:  X:  Y:  Z:

Packing angle

OK Cancel

- MOTION CONTROL -

J1: J1- J1+ 0

J2: J2- J2+ 15

J3: J3- J3+ 0

J4: J4- J4+ 10

J5: J5- J5+ 0

J6: J6- J6+ 15

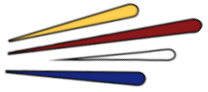
Speed: 500 2000 2000

Step: 1 5 10 15 5

Slider: -100 +100 0

END-EFFECTOR CTRL

SuctionCup ON



## 6. Using the Sliding Rail

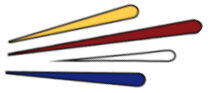
➤ With the TEACHING function

	Trigger	Value	Accessory	AccessoryValue
1	None		Slider	

	Accessory	AccessoryValue
	Slider	speed

	Value	Accessory	AccessoryValue
1	100	Slider	2000



## 6. Using the Sliding Rail

➤ With the BLOCKY function

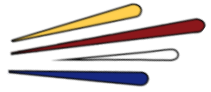
The screenshot shows the Blockly interface with a sequence of blocks:

- SuctionCup On
- Gripper On
- Slider move to: D 0 F 1500 (highlighted with a red box)
- Conveyor move: relative location D 0 F 1500
- Color sensor recognition: Red

The screenshot shows a single block on a grid:

- Slider move to: D 100 F 1500

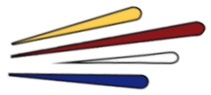




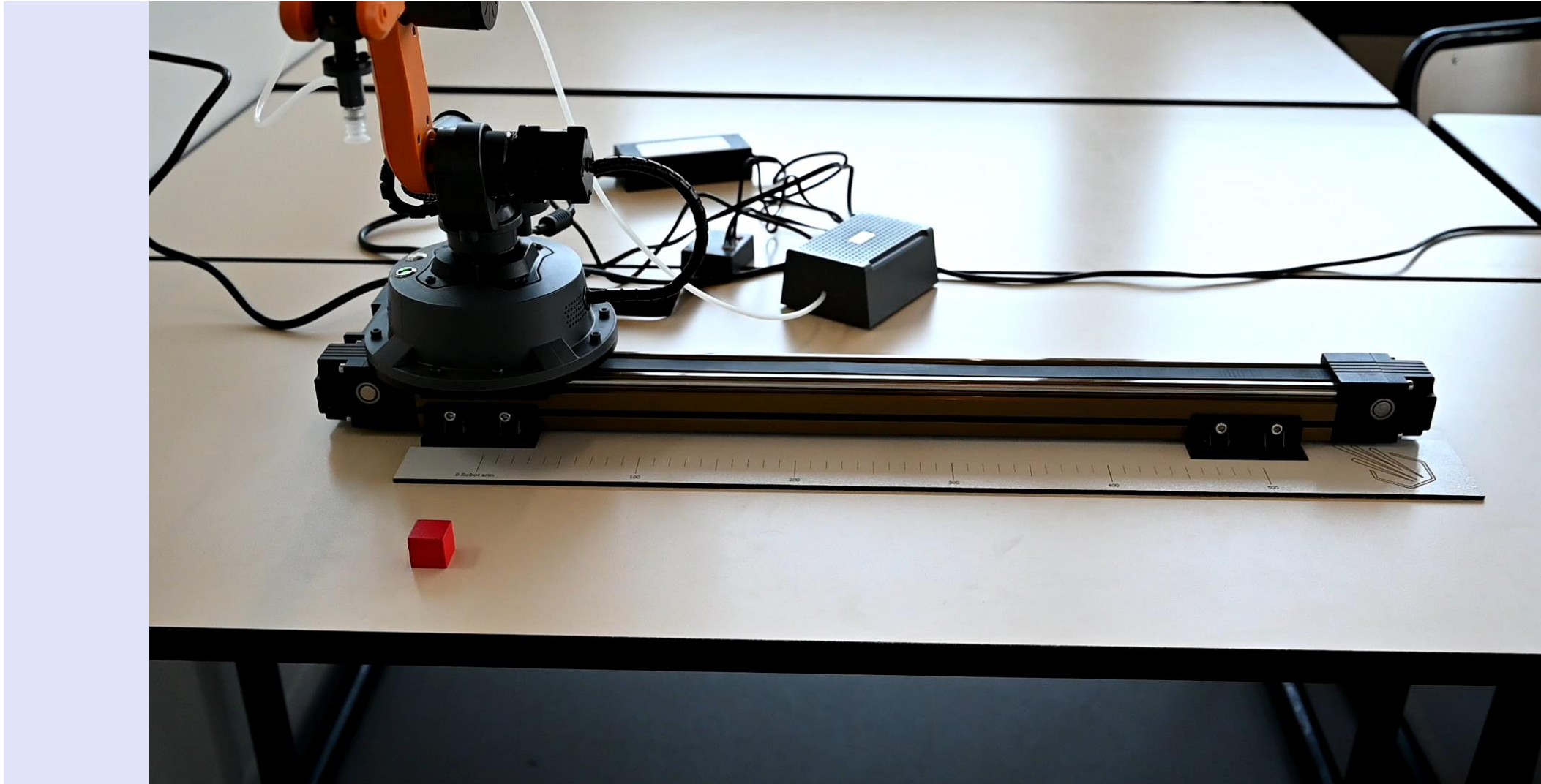
## 6. Using the Sliding Rail

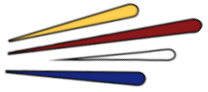
### ➤ Using it with the Pneumatic Set

	J3/Z	J4/RX	J5/RY	J6/RZ	Speed	Pause	Trigger	Value	Accessory	AccessoryValue	
1	0.0	0.0	0.0	0.0	2000.0	100.0	None ▾		Slider ▾	0	2000
2	12.0	0.0	-80.0	0.0	2000.0	100.0	SuctionCup ▾	On ▾	None ▾		
3	2.0	0.0	-80.0	0.0	2000.0	100.0	SuctionCup ▾	On ▾	None ▾		
4	2.0	0.0	-80.0	0.0	2000.0	100.0	SuctionCup ▾	On ▾	Slider ▾	100	1000
5	12.0	0.0	-80.0	0.0	2000.0	100.0	SuctionCup ▾	Off ▾	Slider ▾	100	1000
6	0.0	0.0	0.0	0.0	2000.0	100.0	None ▾		Slider ▾	100	1000
7	0.0	0.0	0.0	0.0	2000.0	100.0	None ▾		Slider ▾	0	2000



## 6. Using the Sliding Rail





## 7. Using the Conveyor



## 7. Using the Conveyor

➤ With the TEACHING function

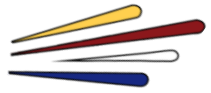
Accessory		AccessoryValue	
Conveyor ▾	Relative ▾	move value	speed

Accessory		AccessoryValue	
Conveyor ▾	Absolute ▾	move value	speed

➤ With the BLOCKY function

The screenshot shows the Blockly interface with a sidebar on the left containing categories: Motion, Parts, Logic, Loops, Math, Text, and Variables. The main workspace contains several blocks: SuctionCup On, Gripper On, Slider move to: D 0 F 1500, Conveyor move: relative ▾ location D 0 F 1500 (highlighted with a red box), and Color sensor recognition: Red ▾.

The close-up shows the 'Conveyor move' block with the mode dropdown set to 'absolute'. The location is 'D', the distance is '0', and the force is '1500'.



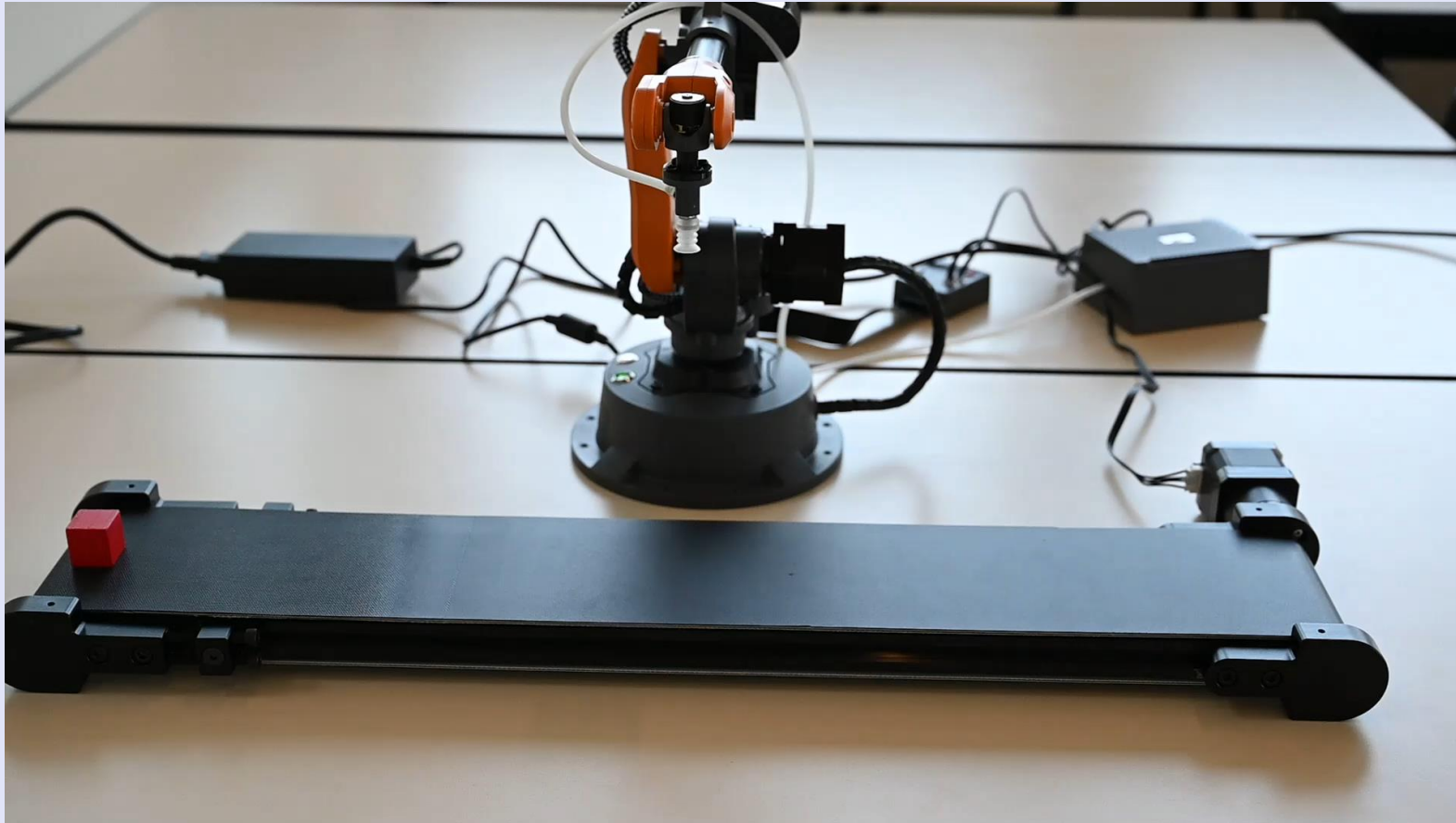
## 7. Using the Conveyor

➤ Example: using the conveyor with the Pneumatic Set

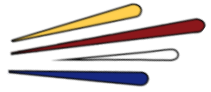
```
Zero position
Conveyor move: relative location D 140 F 2000
MOVJ Move to absolute_location : X 227.6 Y 6 Z 68.7 orientation: A 0 B 0 C 0
SuctionCup On
MOVJ Move to absolute_location : X 227.6 Y 6 Z 184.7 orientation: A 0 B 0 C 0
MOVJ Move to absolute_location : X 137.6 Y 186 Z 19.7 orientation: A 0 B 0 C 0
SuctionCup Off
Zero position
```

## 7. Using the Conveyor

➤ Example: using the Conveyor with the Pneumatic Set





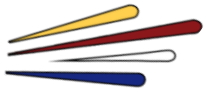


## 8. Bluetooth teach pendant

Mirobot Bluetooth teach pendant is a Bluetooth controller to wirelessly control Mirobot desktop robotic arm. It supports each axis control mode, Cartesian control mode and teaching record mode.

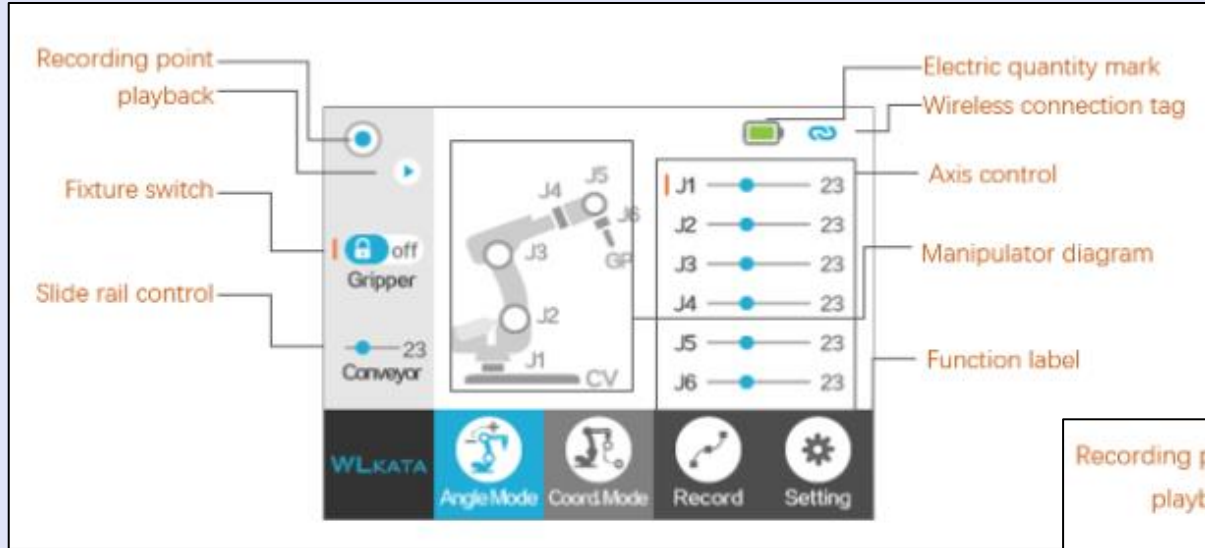




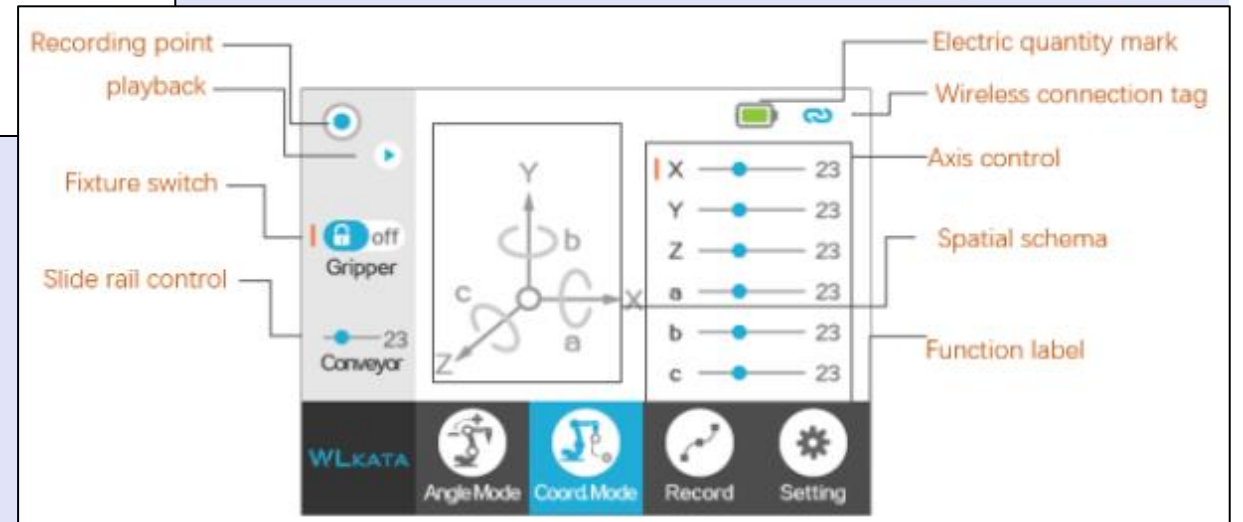


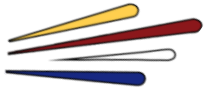
# 8. Bluetooth teach pendant

## Angle Mode page



## Coord Mode page





# 8. Bluetooth teach pendant

## Record page

Electric quantity mark

Wireless connection tag

Replay button

Delete a single record point

List of record points

RecordList 1/8

10pt 999pt 8pt 32pt

14pt 20pt

Play

Del. Single

Del. All

WLKATA

Angle Mode Coord. Mode Record Setting

## Setting page

Electric quantity mark

Wireless connection tag

Search / match manipulator

Rotation speed of each shaft

Increase change per axis

Sliding speed

Speed of recording point

Function label

B | Blue Tooth

S | Rotate Speed of Robot Joints

Search

23

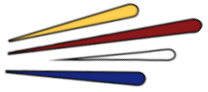
23

23

23

WLKATA

Angle Mode Coord. Mode Record Setting



Thank you for your  
attention