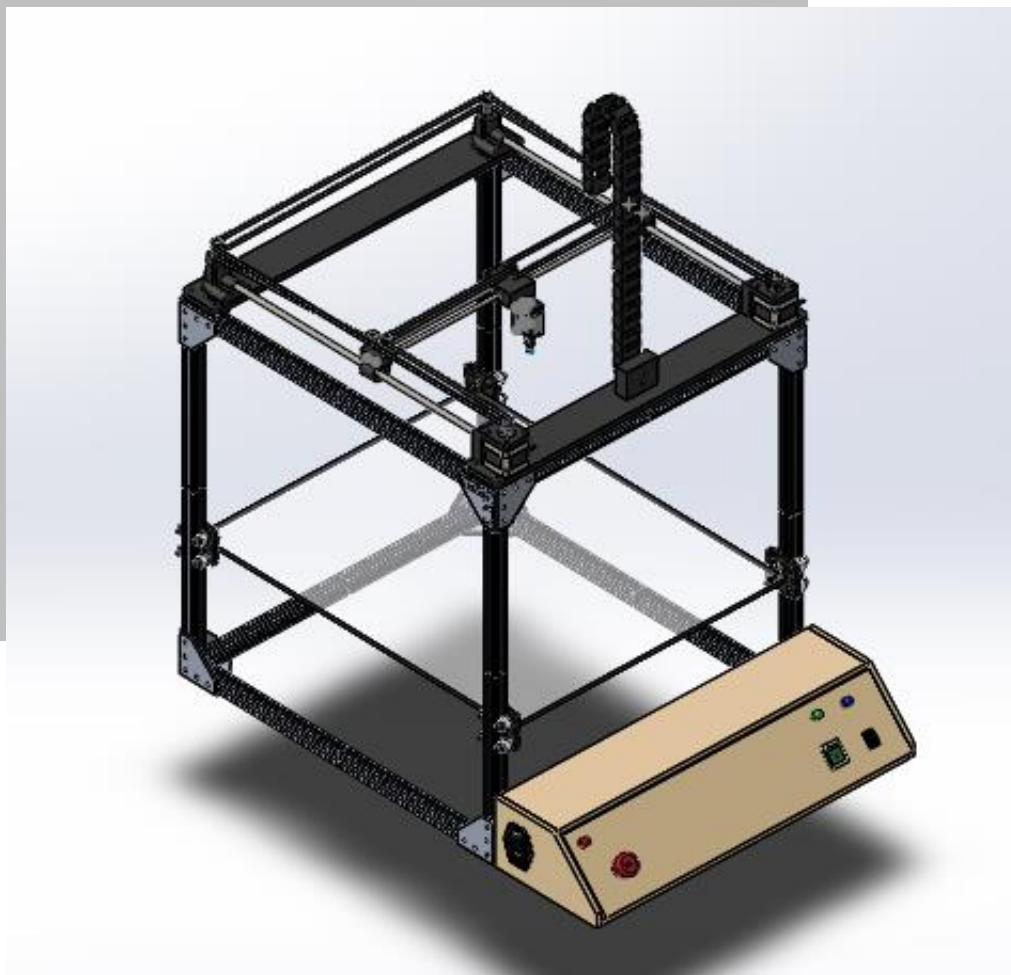


SPARC

Manual 2019



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2. Welcome

Thank you for purchasing the SPARC Robot v1.1 2019. The SPARC Robot is a Cartesian Robotic Probe System (in Spanish: *Sistema Palpador Robotico Cartesiano*). Its primarily function is the testing of several screens with different heights and widths.

This manual explains how to operate the robot. It is expected that the user has its own serial terminal software already installed. In case you do not count with any serial communication software, we invite you to download docklight from the website:

- <https://docklight.de/downloads/>

Once you have successfully prepared the SPARC and the serial terminal correctly configured, simply place a device within the capacity range in the platform and start sending commands from the serial terminal.

3. About the SPARC

3.1 Product Overview

This Section contains information on the SPARC components.

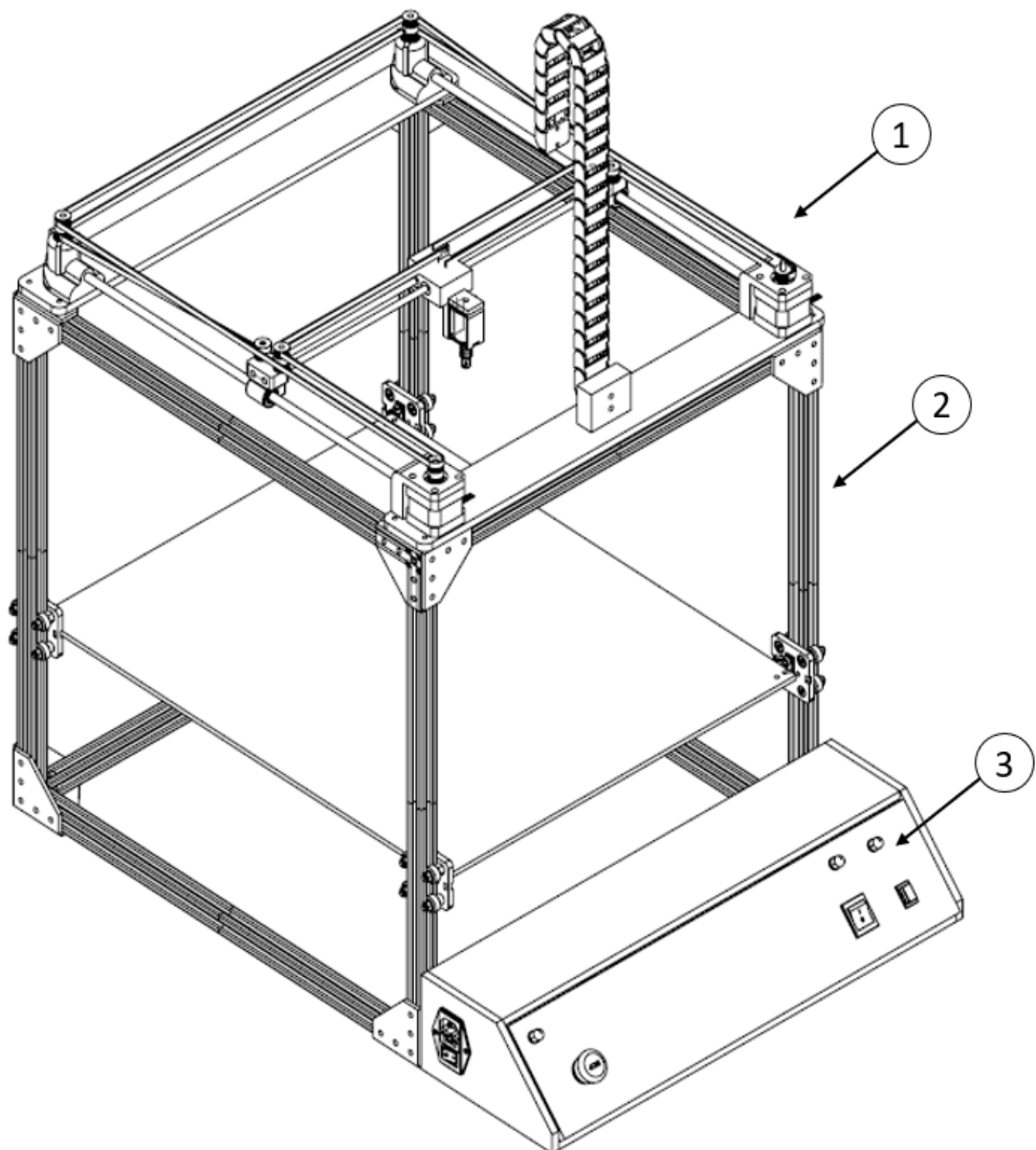


Fig 1. SPARC Robot

1) x and y axis

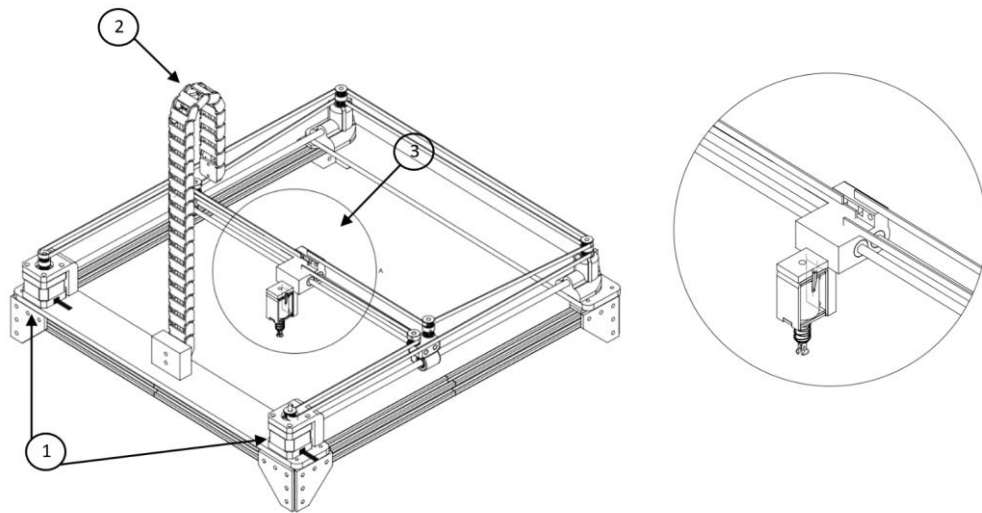


Fig 2. X and Y axis and a close up to the actuator

1	Step Motors: Control the x and y axis
2	Cable holder: Avoids the tangling of cables
3	Actuator: Does a click or a slide on the screen

2) Chassis

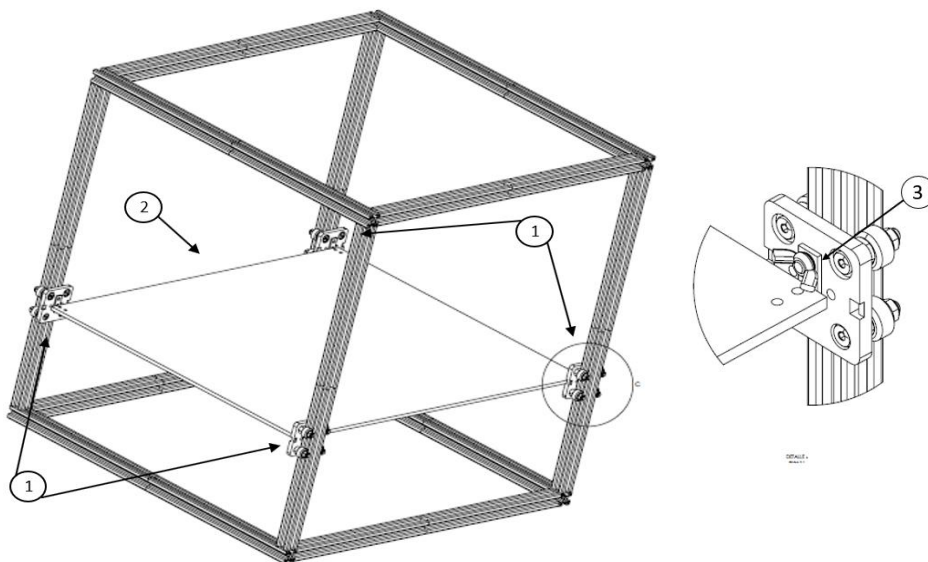


Fig 3. Chassis and a close up on the karts

1	4 karts: Adjust the platform
2	Platform: Sustains the device
3	Wing nut: Adjust the height

3) Dashboard

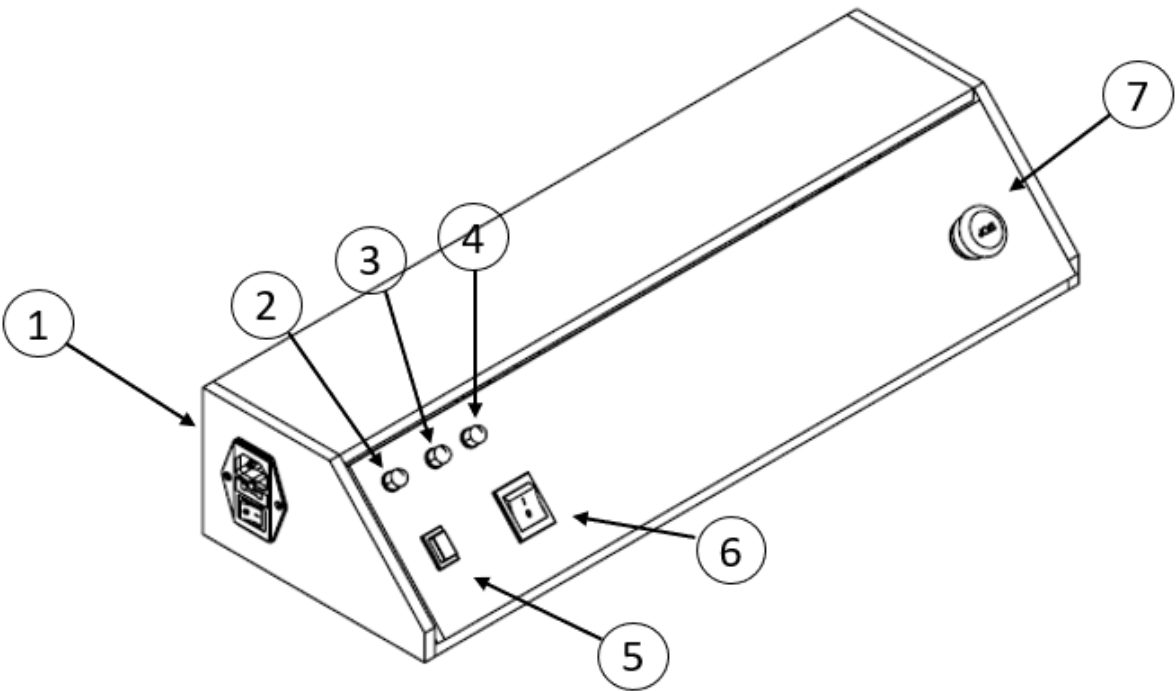


Fig 4. Dashboard

1	Socket: Here is the plug placed
2	Green led: Tells the user when it is ready to receive a command
3	Red led: Tells when there is an error on the commands' syntax
4	Blue led: Tells when the system is on
5	Orange switch: Turns on or off the system
6	Blue switch: Pauses the system
7	Emergency Stop Button: Stops the movement

3.2 Communication

The SPARC uses a UART communication protocol with a baud rate of 9600, with 8 data bits, no parity bit and 1 stop bit. (Fig. 1.)

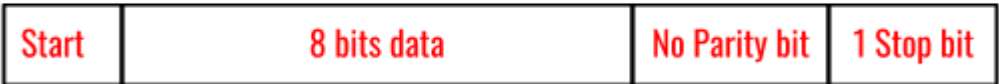
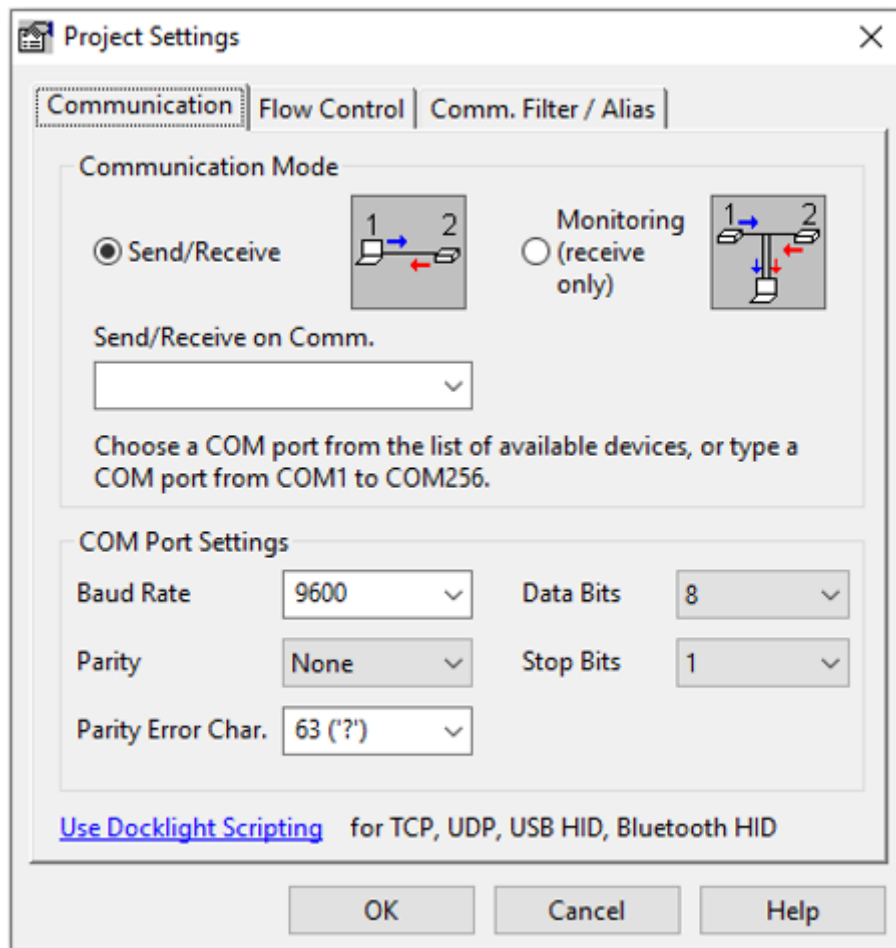


Fig 5. SPARC UART communication Packet

Configure your own serial terminal with the next specifications



Fug 6. Docklight UART configuration

3.3 SPARC information

Capacity	30cm x 30cm x 30cm
Rated Voltage	120 V ac
Platform Area	900 cm ²
External Dimensions, approx.	72 cm x 50 cm x 62 cm
Weight, approx.	15 kg

4. Getting ready to test

4.1 Setting up the height

By loosening the four wing nuts (Fig 7.) in the chassis, you can move freely the platform. Adjust the platform to the desirable height. You should be able to fit any device within a maximum of 30 cm height, 30 cm width and 30 cm depth.

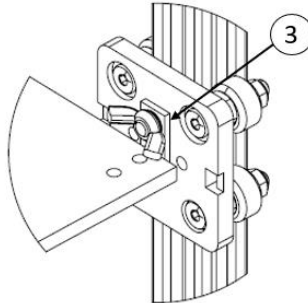


Fig 7. Wing nut

4.2 How to turn on the system

- 1) Connect the plug(1) to a 120v ac socket.
- 2) Turn on the orange switch(2) with the Emergency Stop button(3) pressed.
- 3) Release the Emergency Stop button.

In case of emergency

Push the Emergency Stop button(3) to stop the whole system.

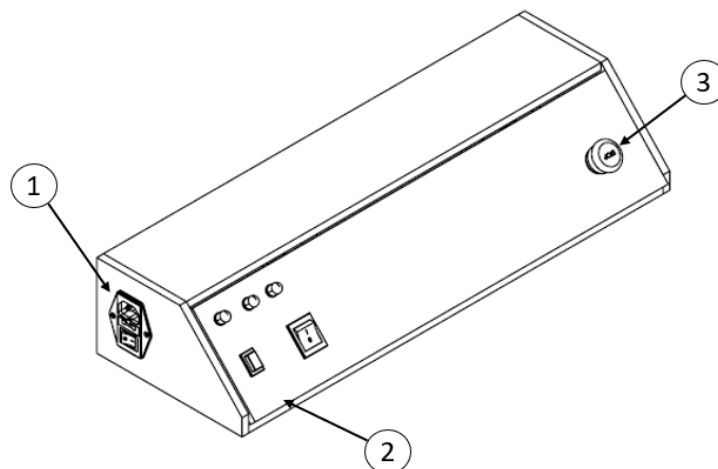


Fig 8. Dashboard

4.3 How to turn off the system

- 1) Press the Emergency Stop button(3)

2) Turn off the on/off switch(2)

5. Operation

5.1 Commands syntax

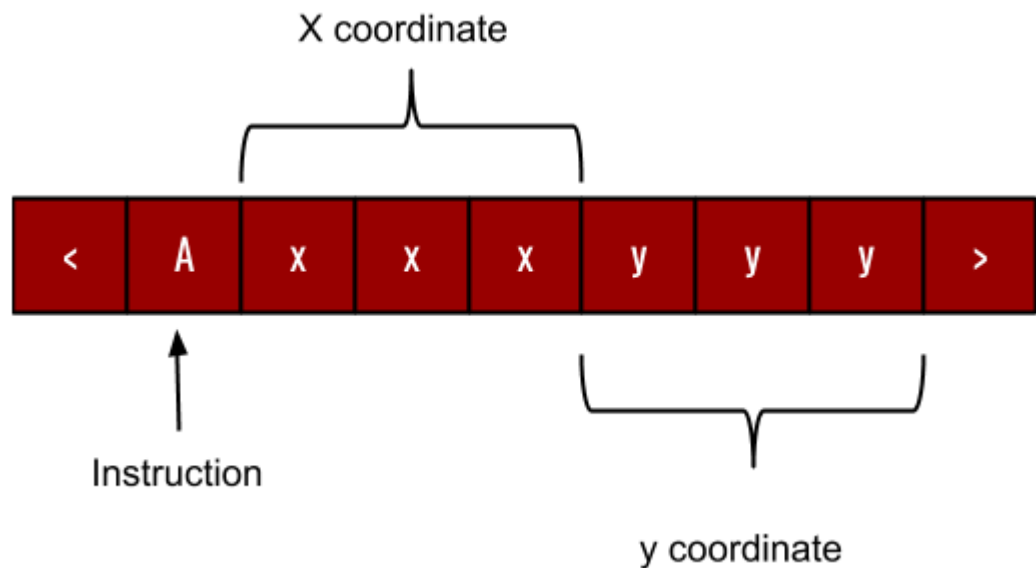


Fig. 9. Command Packet

→ Instruction set:

- ◆ "C": The actuator will make a simple click on the given coordinate.
- ◆ "S": The actuator will slide from the current position to the given coordinate.

→ X coordinate:

- ◆ Number between 0 and 300

→ Y coordinate:

- ◆ Number between 0 and 300

5.2 SPARC Error Messages

There is a feature inside the code for programmers, if DEBUG is not defined, the next messages appear. Else, if DEBUG is defined within any .h file from the project, string messages will appear.

For each error a different character in the serial terminal will be displayed. Errors are classified as follow:

1) Frame error:

Frame error occurs whenever the first and last character received does not match to the assigned character:

- First character must be '<'
- Last character must be '>'

Character displayed	!
ASCII value	0x21

If DEBUG is defined the next message appears: "[Frames are not inserted correctly](#)"

2) Command error:

Whenever the coordinates inserted (characters 3 to 8 from the command packet) does not match arabic numbers.

Character displayed	&
ASCII value	0x26

If DEBUG is defined the next message appears: "[Commands were not recognized](#)"

3) Type of instruction error:

Whenever the second character received does not match to the assigned character, which can be:

- 'S' ----> For slide instruction
- 'C' ----> For Click instruction

Character displayed	+
ASCII value	0x2B

If DEBUG is defined the next message appears: "[Touch Instruction is not recognized](#)"

4) Coordinates size surpasses error:

Whenever the coordinates inserted exceeds the maximum operating size (300), an error is displayed.

Character displayed	%
ASCII value	0x25

If DEBUG is defined the next message appears: "[Surpasses coordinates size](#)"