



# Roobopoli

ROOBOKART V2 Mounting  
Verification MANUAL

## summary

Track history .....	2
Test firmware .....	3

## Track history

<b>revision</b>	<b>date</b>	<b>description</b>
RelA, 10	18/05/2020	First release

## Test firmware

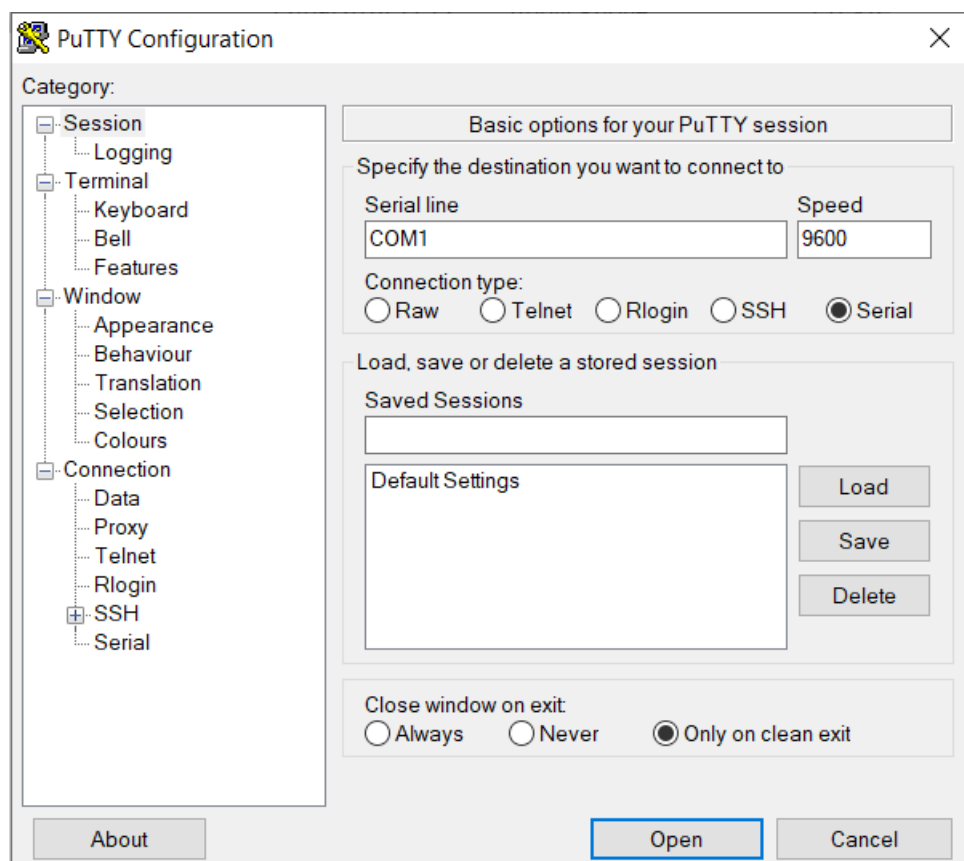
The test firmware allows you to verify the correct assembly and communication of the sensors with the Nucleo board.

The first step is the programming of the microcontroller, loading the test firmware.

To load the test firmware, connect the Nucleo board to your PC. This will be seen by WindowsOS as an external drive. Copy the "Roobokart\_Test.bin" file into this drive.

Run Windows "Device Manager" to retrieve the COM number assigned by the operating system.

Launch the putty.exe software, select Serial, and enter the COM assigned by windows. Leave the default speed of 9600 bps



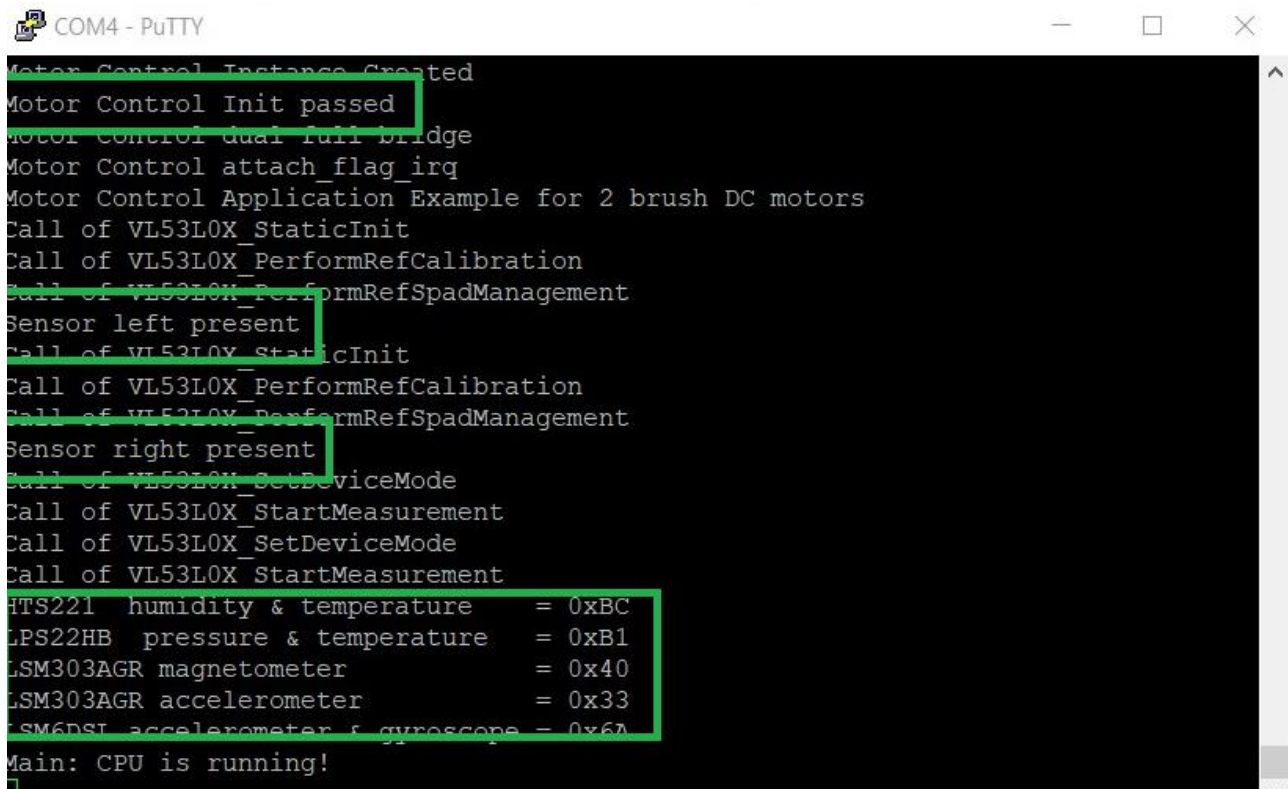
Click the Open button.

Once the connection has been established, a click on the black button of the board will reset the microcontroller.

The first messages visible in PuTTY, or any other serial monitor, will be initialization messages.

It is important that highlighted messages are visible.

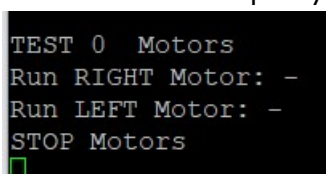
The values shown in the figure for temperature, pressure & temperature, magnetometer, accelerometer and accelerometer and gyroscope sensors represent the I2C addresses of the devices. These addresses may vary. If the devices have been correctly recognized, a non-zero value will still be printed.



```
COM4 - PuTTY
Motor Control Instance Created
Motor Control Init passed
Motor Control dual full bridge
Motor Control attach_flag_irq
Motor Control Application Example for 2 brush DC motors
Call of VL53L0X_StaticInit
Call of VL53L0X_PerformRefCalibration
Call of VL53L0X_PerformRefSpadManagement
Sensor left present
Call of VL53L0X_StaticInit
Call of VL53L0X_PerformRefCalibration
Call of VL53L0X_PerformRefSpadManagement
Sensor right present
Call of VL53L0X_SetDeviceMode
Call of VL53L0X_StartMeasurement
Call of VL53L0X_SetDeviceMode
Call of VL53L0X_StartMeasurement
HTS221 humidity & temperature = 0xBC
LPS22HB pressure & temperature = 0xB1
LSM303AGR magnetometer = 0x40
LSM303AGR accelerometer = 0x33
LSM6DSL accelerometer & gyroscope = 0x6A
Main: CPU is running!
```

The available tests are:

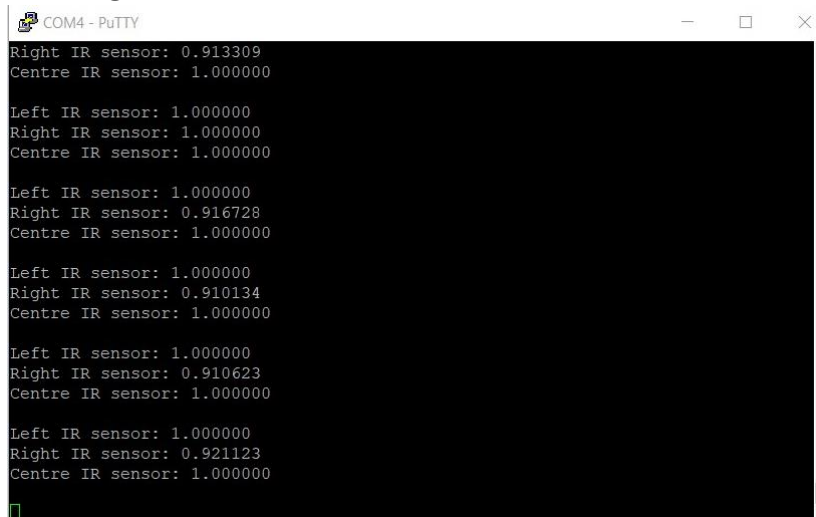
0. **ENGINES** – One 0 appears on the Roobokart display. The left and right engines will be activated alternately. The test is positively passed if the correct engine rotates, i.e. the one indicated on the Roobokart display and by serial message;



```
TEST 0 Motors
Run RIGHT Motor: -
Run LEFT Motor: -
STOP Motors
```

If it does not rotate the right expected motor, the wire pairs of the motors should be reversed. If the motors do not rotate in the verse that the Roobokart advances, the engine wires must be reversed.

1. **INFRARED SENSORS** – A number 1 appears on the Roobokart display. They are printed with messages on the serial connection, the values read by the three infrared sensors. When the Roobokart is raised, the read value approaches 1.0, when the sensor is obscured with one finger, the value drops drastically. There is no optimal value, the useful threshold will be measured when calibrating the sensors. What is important at this stage is to see a change in the value read in the two situations indicated;



The image shows a screenshot of a PuTTY terminal window titled 'COM4 - PuTTY'. The terminal displays a series of sensor readings for three infrared sensors: Right, Centre, and Left. The Centre sensor consistently reads 1.000000. The Right sensor reads approximately 0.91, and the Left sensor consistently reads 1.000000. The readings are as follows:

```
Right IR sensor: 0.913309
Centre IR sensor: 1.000000

Left IR sensor: 1.000000
Right IR sensor: 1.000000
Centre IR sensor: 1.000000

Left IR sensor: 1.000000
Right IR sensor: 0.916728
Centre IR sensor: 1.000000

Left IR sensor: 1.000000
Right IR sensor: 0.910134
Centre IR sensor: 1.000000

Left IR sensor: 1.000000
Right IR sensor: 0.910623
Centre IR sensor: 1.000000

Left IR sensor: 1.000000
Right IR sensor: 0.921123
Centre IR sensor: 1.000000
```

2. **BUZZER** – A number 2 appears on the Roobokart display. The buzzer makes a sound
3. **COLOR SENSOR** – A number 3 appears on the Roobokart display. They are printed with messages about the serial connection, the values of the three components, Blue, Red and Green of the color perceived by the color sensor. Also for this sensor, a calibration procedure is described the sensor calibration document;



```
COM4 - PuTTY
Red: 344
Green: 430

Blue: 426
Red: 345
Green: 430

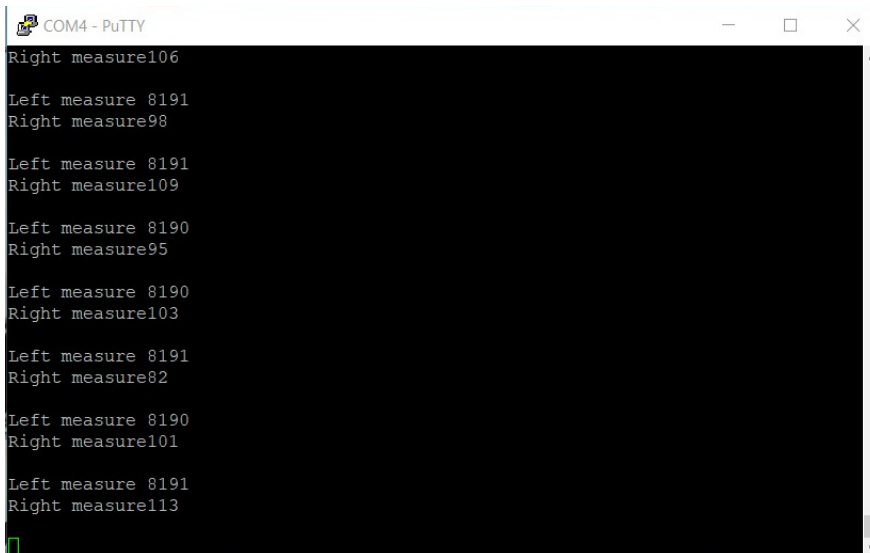
Blue: 428
Red: 346
Green: 431

Blue: 429
Red: 347
Green: 432

Blue: 430
Red: 348
Green: 433

Blue: 431
Red: 348
Green: 433
```

4. PROXIMITY SENSORS (ToF)– A number 4 appears on the Roobokart display. They are printed with messages on the serial connection, the values of distances from an obstacle measured by the left and right sensors. It will be enough to approach and move the hand away from the sensors and check a consistent variation in distances



```
COM4 - PuTTY
Right measure106
Left measure 8191
Right measure98

Left measure 8191
Right measure109

Left measure 8190
Right measure95

Left measure 8190
Right measure103

Left measure 8191
Right measure82

Left measure 8190
Right measure101

Left measure 8191
Right measure113
```

**THE SWITCH FROM ONE TEST TO ANOTHER TAKES PLACE WITH A CLICK ON THE BLUE BUTTON OF THE BOARD. THE TRANSITION TO THE NEXT TEST IS NOT INSTANTANEOUS, BUT YOU WILL HAVE TO WAIT FOR THE END OF THE CURRENT TEST CYCLE**