PiBot Robots Setup Guide

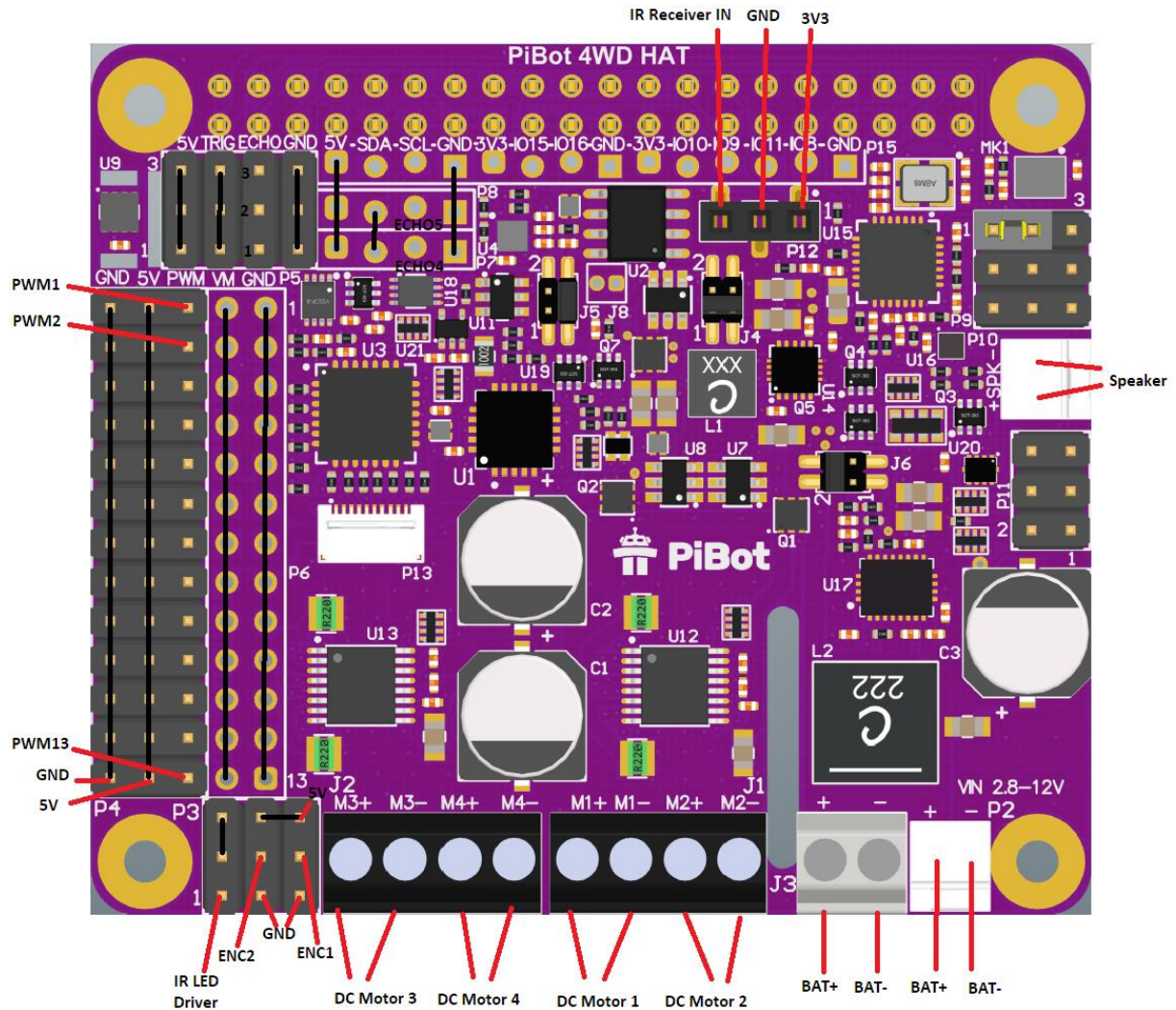## Ports and Signals

PiBot 4WD

Figure 1 PiBot 4WD HAT Ports and Signals
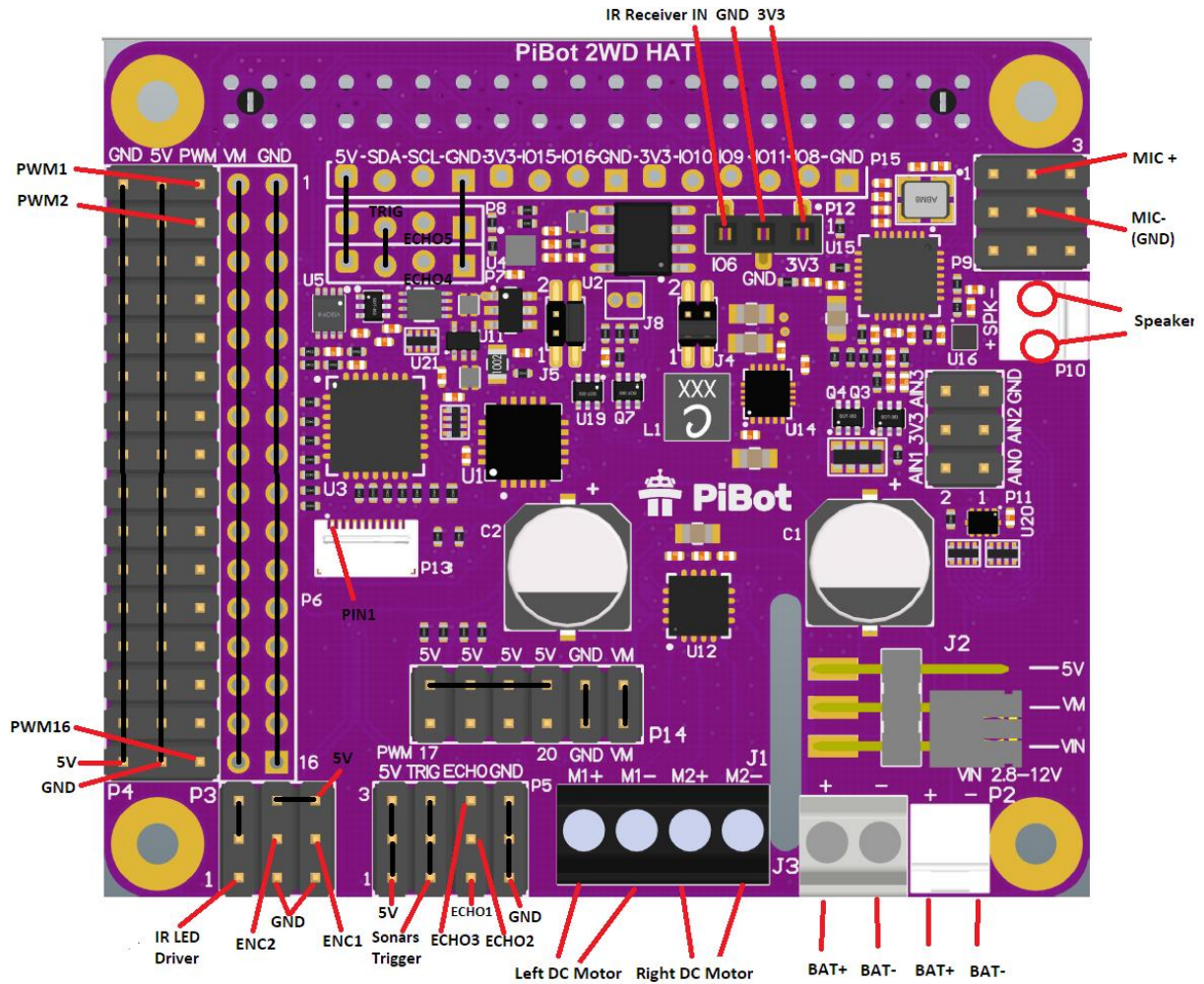
PiBot 2WD

Figure 2 PiBot 2WD HAT Ports and Signals
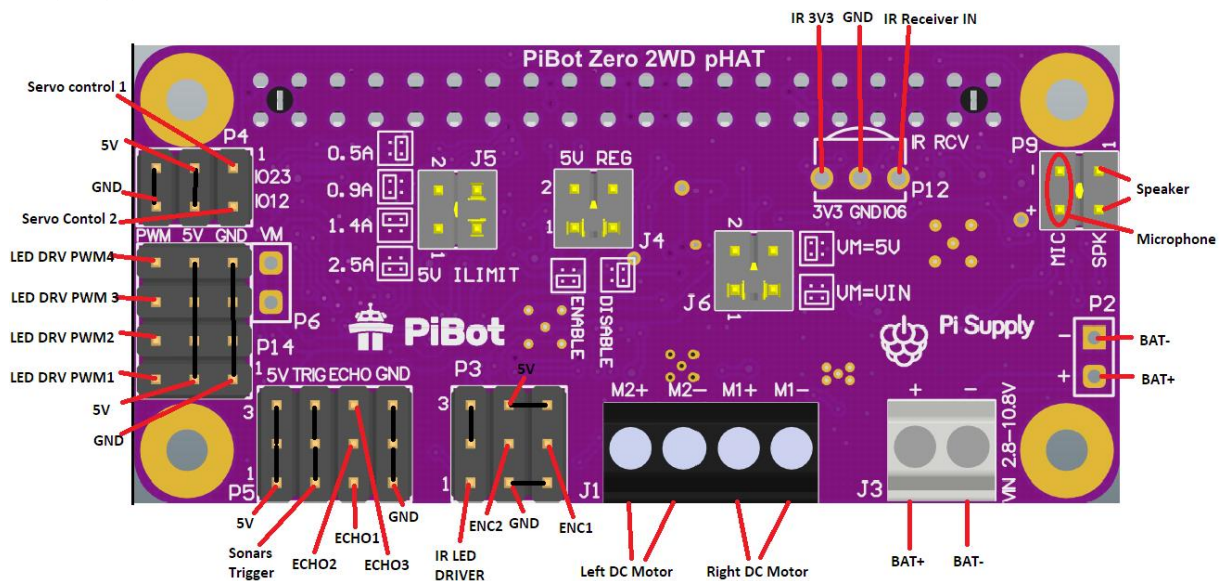
PiBot Zero
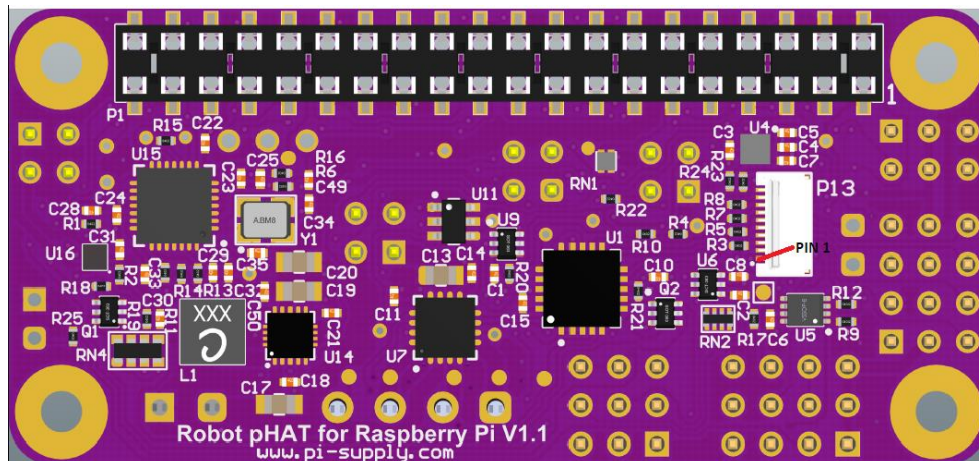

Figure 3 PiBot Zero Ports and Signals Top

Figure 4 PiBot Zero Ports and Signals Bottom
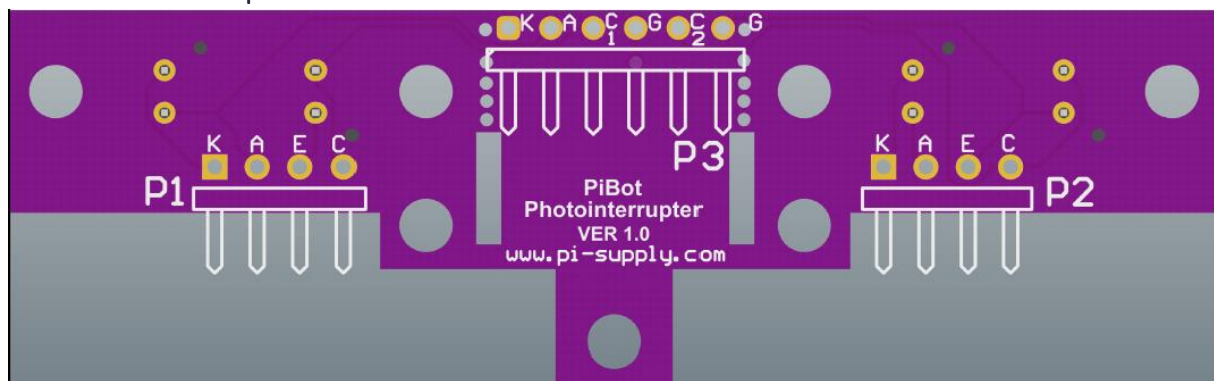
PiBot Photointerrupter Board

Figure 5 PiBot Photointerrupter Board Ports

Header P1

This header can be used if two photointerrupters are separated by braking board.

- K - IR LED's Kathode of photointerrupter 1
- A - IR LED's Anode of photointerrupter 1
- E - Phototransistor emitter of photointerrupter 1
- C - Phototransistor collector of photointerrupter 1

Header P2

This header can be used if two photointerrupters are separated by braking board.

- K - IR LED's Kathode of photointerrupter 2
- A - IR LED's Anode of photointerrupter 2
- E - Phototransistor emitter of photointerrupter 2
- C - Phototransistor collector of photointerrupter 2

Header P3

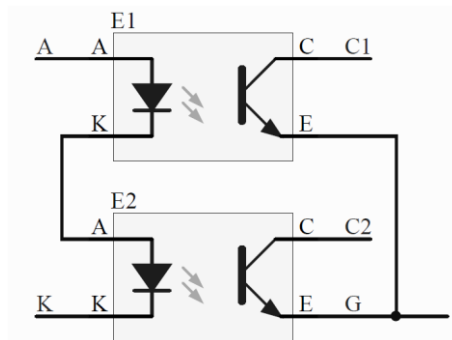*Figure 6 Photointerrupter Board Schematic*

- K - Kathode end of series connection of IR LED's, see **Figure 6**,
- A - Anode end of series connection of IR LED's, see **Figure 6**,
- C1 – Phototransistor's collector of photointerrupter 1,
- C2 – Phototransistor's collector of photointerrupter 2,
- G – Common ground connection.
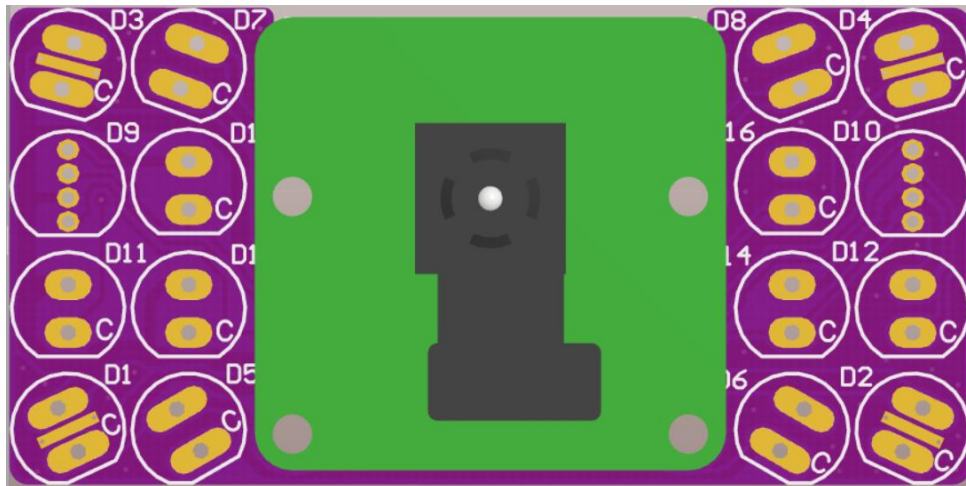
PiBot LED Panel Board
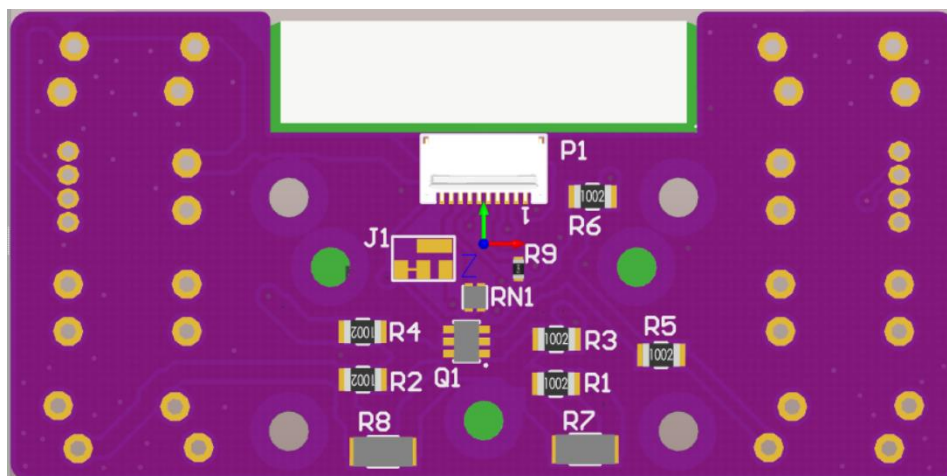

Figure 7 LED Panel front

Figure 8 LED Panel back

Bare LED panel should be populated with desired LEDs according to Table 1 LED Panel population. If D9 is populated than D11, D13 and D15 should not be populated. . If D10 is populated than D12, D14 and D16 should not be populated.

Table 1 LED Panel population

LED Positions	LED Type	Part reference
D1, D2, D3, D4	Through hole 25mA white or 250mA SMD white.	C513A-WSN-CW0Z0151, MLCAWT-A1-0000-000WE7
D5, D6, D7, D8	Infrared LEDs	HSDL-4261
D9, D10	RGB LEDs	WP154A4SEJ3VBDZGW/CA
D11,D12,D13,D14,D15,D16	Single color LEDs	Any 5mm,20mA TH signal LED

PiBot HAT to Raspberry Pi Mounting

PiBot 2WD

Use 9 – 10mm (9mm recommended) spacers to fix PiBot 2WD directly on top of Raspberry Pi.

Use 2X20 pins adaptor header to stack PiBot 2WD on Top PiJuice.

Connections

Power
Battery connects to J3 terminal block or P2 2.54mm header.

DC Motors
Two DC motors that driver robot wheels connects to J1 and J2 (only on 4WD) terminal block like designated.

Photointerrupter Board
Photointerrupter board can be used to make Speed Encoder. Use 5 wires proto cable to connect Photointerrupter board P3 header with PiBot 2WD P3 header by connecting corresponding pins from Table 2.

Table 2 Photointerrupter Board connection with PiBot 2WD

Photointerrupter board P3 pin	PiBot 2WD pin
1 (K)	1 (IR LED DRIVER)
2 (A)	6 or 9 (5V)
3 (C1)	8 (ENC1)
4 (G)	4 or 7 (GND)
5 (C2)	5 (ENC2)

Servos
Servo (e.g motor for camera pan tilt) should have 3 pin 2.54 female cable connector in order to connecto to PiBot HAT.

PiBot 4WD
Connect Servo motors to any of 13 PWM channels on P4 Header.

Connect Servo motors to any of 16 PWM channels on P4 Header (Channel 16 cannot be used if IR LED Driver is connected).

Connect Servo motors to any of two channels on P4 Header.

LED Panel

Connect LED Panel to PiBot HAT using 0.5mm pitch, 10 core FPC cable through P1 connector on panel board and P13 connector on PiBot HAT. Connector pin 1 must be matched on both sides.

Single LEDs

LEDs can be wired to any of PWM output drive channels. It is recommended to connect LED's Cathode to PWM output and Anode to 5V rail.

Sonars

Use 4 core 2.54mm female/female cable to connect Sonars to one of 3 Sonar channels on PiBot 2WD Header P5. On PiBot 4WD or PiBot 2WD, Headers P7 and P8 can also be used to connect to additional Sonars with 4 core female/male cable.

IR Receiver

Connect Infrared remote receiver ic like TSOP4338 to female header P12 on PiBot HAT, directly or using cable with 2.54 male pins connector (PiBot Zero requires soldering of female header or direct IR ic soldering).

Speaker

PiBot 4WD

Connect loudspeaker using cable with 2.54 female connector to P10 header on PiBot 4WD.

PiBot 2WD

Connect loudspeaker using cable with 2.54 female connector to P10 header on PiBot 2WD.

PiBot Zero

Connect loudspeaker using cable with 2.54 female connector to P9 header, pins 1-2 on PiBot Zero.

Electret Microphone

PiBot 4WD

Connect Electret microphone using cable with 2.54 female connector to P9 header on PiBot 4WD. Wire Mic output to pin 2 (MIC+) and Mic ground to pin 5 (see Figure 2).

PiBot 2WD

Connect Electret microphone using cable with 2.54 female connector to P9 header on PiBot 2WD. Wire Mic output to pin 2 (MIC+) and Mic ground to pin 5 (see Figure 2).

PiBot Zero

Connect Electret microphone using cable with 2.54 female connector to P9 header on PiBot Zero. Wire Mic output to pin 4 (MIC+) and Mic ground to pin 3 (see Figure 3).

Camera Pan/Tilt Assembly

Camera can be connected to Raspberry Pi camera connector and mounted to Pan/Tilt hardware with servos together with LED Panel Board using screws. Figure 9 shows example of Camera Mounting to PiBot LED Panel Board and Lynx B-Pan/Tilt Kit.

Figure 9 Camera to Pan/Tilt with LED Panel Mounting

Leva Robot Kit Assembly

Figure 10 shows Robocar made using Leva Robot kit plus PiBot HAT and Raspberry Pi computer as controller.
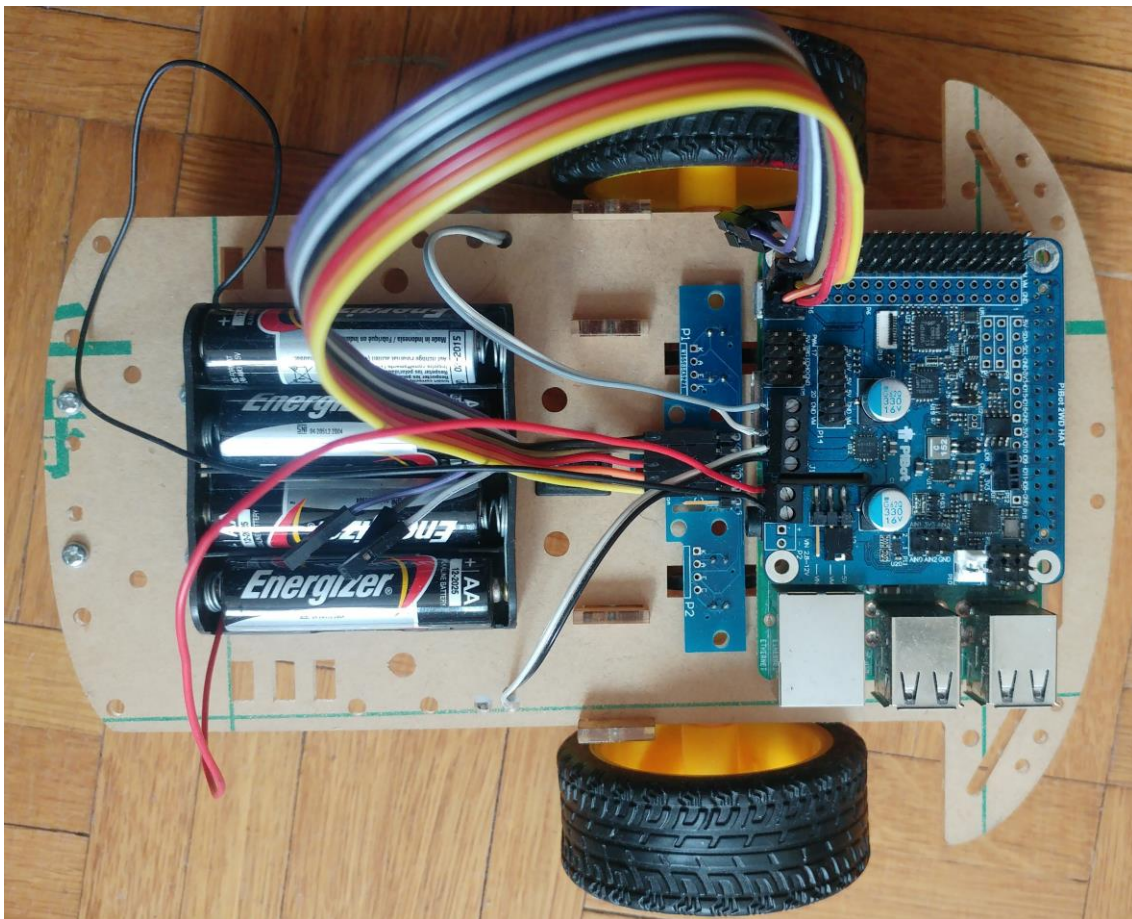

Figure 10 Robocar made from Leva robot kit and PiBot boards.