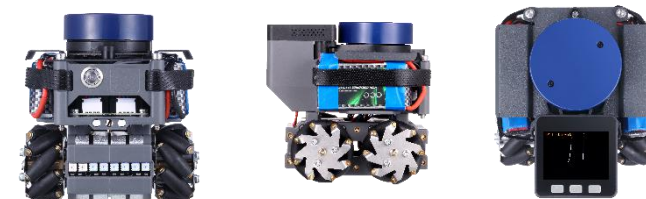




# Lidarbot Odos



# Cotents



**Overview**  
&Product features



**Shipping List**  
&Application



**Protocal**  
for car bottom board



**Paramater**  
&interfaces



**User manual**  
Match methods



**YDLIDAR X2**  
paramater&interfaces

<https://github.com/YDLIDAR/lidarCar> (code)





## Overview



Odos is a powerful development kit for Automated Guided Vehicles(AGVs). Equipped with YDLIDAR X2, 4 Mecanum wheels, M5 Core, RGB Bars and a remote controller with Joystick panel and more. With 4 Mecanum wheels, you can make it move to any direction like forward, backward, left and right. The Lipo Batteries empower the Robot to run long-hours. You can display the map data, that obtained from the lidar sensor, on the screen or upload somewhere else thru Wi-Fi and program it into any format.

Real-Time communication has implemented via ESP-NOW between robot and remote, Mazing-running, self-tracing and more. If you are interested in AGV development, it's encouraged to modify the open-source code we offered on GitHub and enhance it yourself.

## Product Features

- Mecanum wheel
- 360 degree Lidar sensor
- Compatible with LEGO structure
- Waterproof metal self-locking switch
- RGB LED strip \* 8



## Shipping List

- LidarBoT x 1
- remote control handle x 1
- battery (1300mAh @ 11.1V) x 2
- battery charger x 1
- Type-C USB x 1

## Application

- Indoor navigation
- Walk the maze autonomously
- route plan
- Autopilot

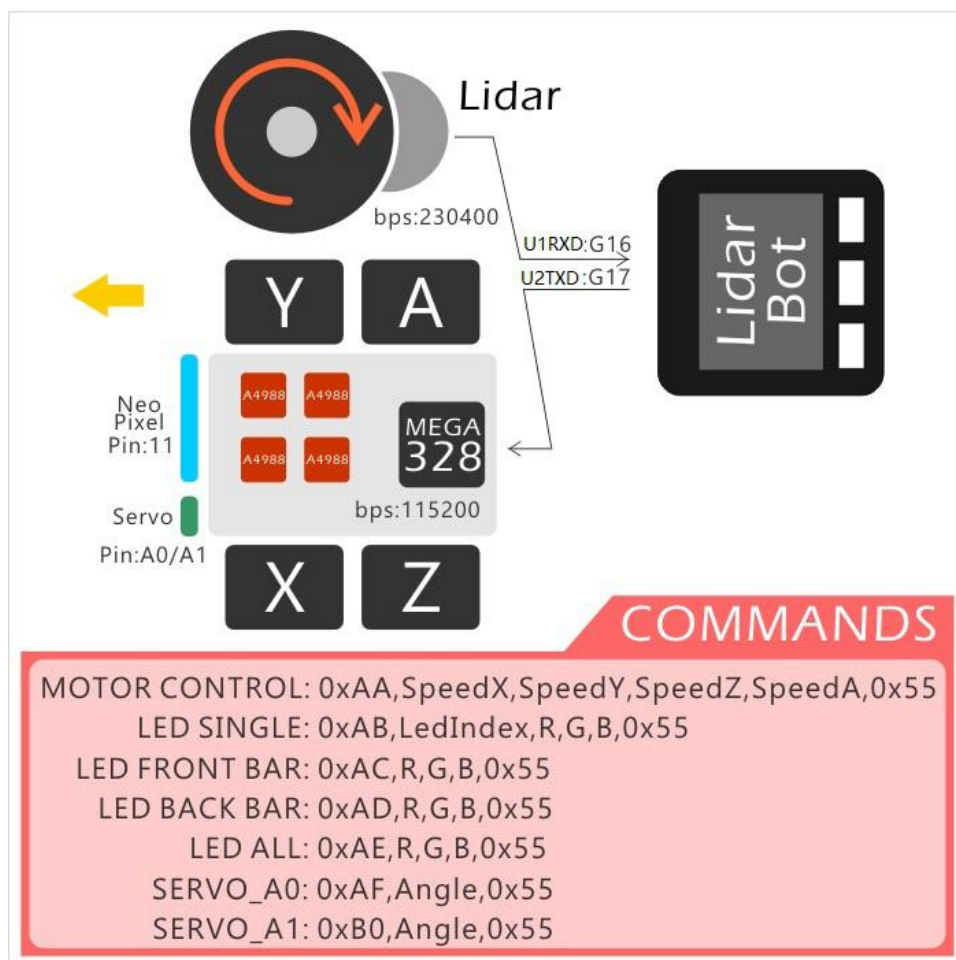




# Protocol for CarBottomBoard

Protocol Format: Data Header ( command type ) + Data Packet + Data Tail

Control Target	Protocol Format	Example	Function
Wheels	0xAA, SpeedX(-7 ~ 7),SpeedY,SpeedZ,SpeedA,0x55	0xAA, 5, 5, 5, 5, 0x55(Go ahead, speed: 5)	ControlWheel(5, 5, 5)
One RGB	0xAB,LedIndex,R(0 ~ 254),G,B,0x55	0xAB, 3, 20, 50, 100, 0x55(3th RGB displays specific color)	setLedColor(3, 20, 50, 100)
Front RGB Bar	0xAC,R(0 ~ 254),G,B,0x55	0xAC, 20, 50, 100, 0x55(Front LED Bar displays specific color)	setFrontLedBar(20, 50, 100)
Back RGB Bar	0xAD,R(0 ~ 254),G,B,0x55	0xAD, 20, 50, 100, 0x55(Back LED Bar displays specific color)	setBackLedBar(20, 50, 100)
All RGB	0xAE,R(0 ~ 254),G,B,0x55	0xAE, 20, 50, 100, 0x55(All LED display specific color)	setLedAll(20, 50, 100)
ServoMotor0	0xAF,Angle(0 ~ 180),0x55	0xAF, 100, 0x55(Servo 0 turns angle 100 degree)	setServo0Angle(100)
ServoMotor1	0xB0,Angle(0 ~ 180),0x55	0xB0, 100, 0x55(Servo 1 turns angle 100 degree)	setServo1Angle(100)



## Parameters and interfaces

### Communication Parameter:

M5Core <-> Lidar (U1RXD(GPIO16) <-> Lidar sensor)

Serial Configuration: "230400bps, 8, n, 1"(8 bits data, no parity, 1 stop bit)

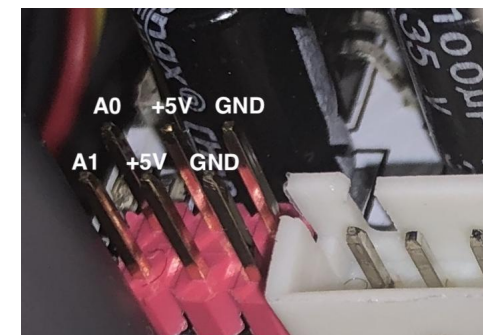
M5Core <-> Bottom Board (U2TXD(GPIO17) <-> Bottom Board) Serial Configuration: "115200bps, 8, n, 1"(8 bits data, no parity, 1 stop bit)

### PIN Map:

ServoMotor0 <-> A0(MEGA328)

ServoMotor1 <-> A1(MEGA328)

RGB LED <-> 11(MEGA328)







# USER MANUAL



## Match lidarbot and handle

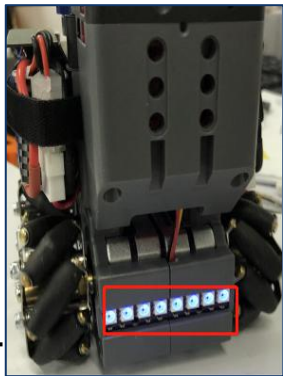
reset



① Lidarbot- Long press C button and then press reset button (the red one)

② Control handle- Long press A and then reset

③ Lidarbot- press B (ok) (BLUE/RED light on)



reset



visit [192.168.4.1/map](http://192.168.4.1/map) directly can also view the point cloud map when Odos is ready



## Detail instructions

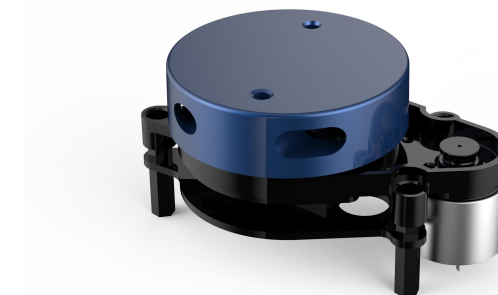
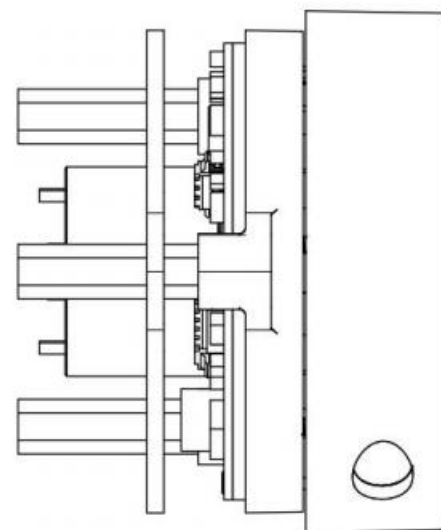
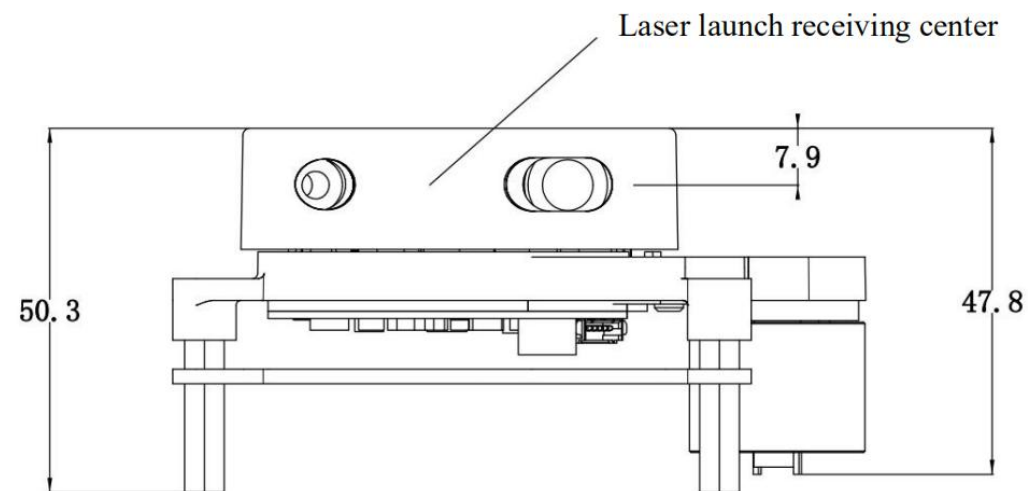
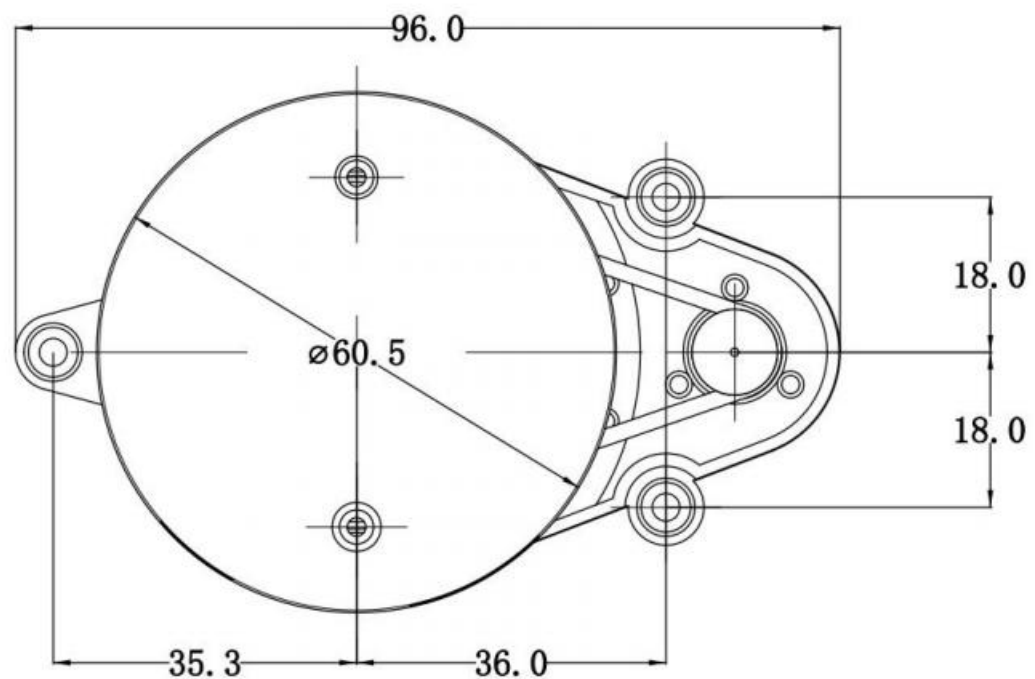
- **## X2lidarBot**
- **### Control and display**
  - Odos and the handle achieve communication through EspNow. Point cloud(map) would be displayed on the screen, and the handle can control Odos.
  - **-Normal control mode**: Move the joystick, Odos will realize forward, backward and steering.
  - **-Omnidirectional control mode**: Hold down the A button of the handle, (the leftmost one)and then move the joystick to achieve the left and right horizontal movement. Notice: The front and back directions are reversed.
- **### Connect and match**
  - In the unconnected state or when one party is not connected to the other, the display or control may have problems. If so, please re-connect.
  - **-STEP 1**:Keep holding the C button and press the power button one time. Wait for the screen to restart and then release the C button to enter the broadcast mode.
  - All slaves will receive the signal from the master.
  - -When Odos enters the broadcast mode, repeat **STEP 1** to see the current broadcast host on the screen. Button A/C means up and down, and button B means to confirm. The Mac address of the host can be viewed from the mobile phone or computer near Wi-Fi. The host starts with lidar and is followed by the host Mac address.
  - -After confirming the master, the screen of the master and Odos will receive the confirmation signal of the slave, and the address of the slave and the handle will also be selected and determined by the ABC key. After pressing the B key to confirm, Odos and the handlebar have completed the communication configuration, and the two parties can send messages to each other to realize the Lidar chart display and handlebar control.
- **### Web page shows the Lidar image**
  - If you don't want to match the handle and Odos, please visit **192.168.4.1/map** to check the Lidar chart information.

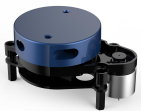




# YDLIDAR X2

## Dimensions





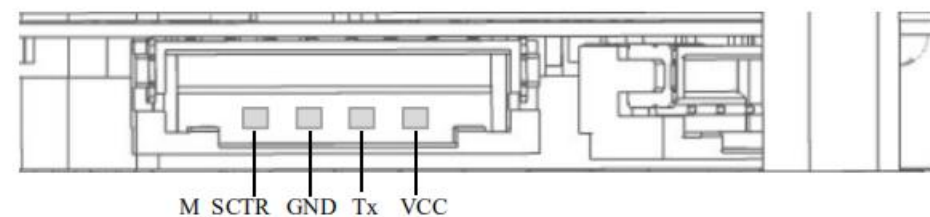
## Product Parameter

Item	Min	Typical	Max	Unit	Remarks
Ranging frequency	-	3000	-	Hz	3000 times per second
Motor frequency	-	7	-	Hz	PWM or Voltage Regulation
Ranging distance	0.10	-	>8	m	Indoor
Scanning angle	-	0~360	-	Deg	-
Absolute error	-	2	-	cm	Distance≤0.5m
Relative error	-	1.5%	-	-	0.5m<Distance≤6m
	-	2.0%	-	-	6m<Distance≤8m
Angle resolution	0.82	0.84	0.86	Deg	Scanning frequency=7

## Electrical Parameter

Item	Min	Typical	Max	Unit	Remarks
Supply voltage	4.8	5	5.2	V	Excessive voltage might damage the Lidar while low affect normal performance
Voltage ripple	0	50	100	mV	Excessive ripple affect normal performance
Starting current	300	400	500	mA	Higher current required at start-up
Working current	200	350	380	mA	Normal working

## Interface



Pin	Type	Description	Defaults	Range	Remarks
VCC	Power Supply	Positive	5V	4.8V~5.2V	-
Tx	Output	System serial output	-	-	Data stream: Lidar→Peripherals
GND	Power Supply	negative	0V	0V	-
M_SCTR	Input	Motor speed control terminal	1.8V	0V~3.3V	Voltage or PWM speed regulation