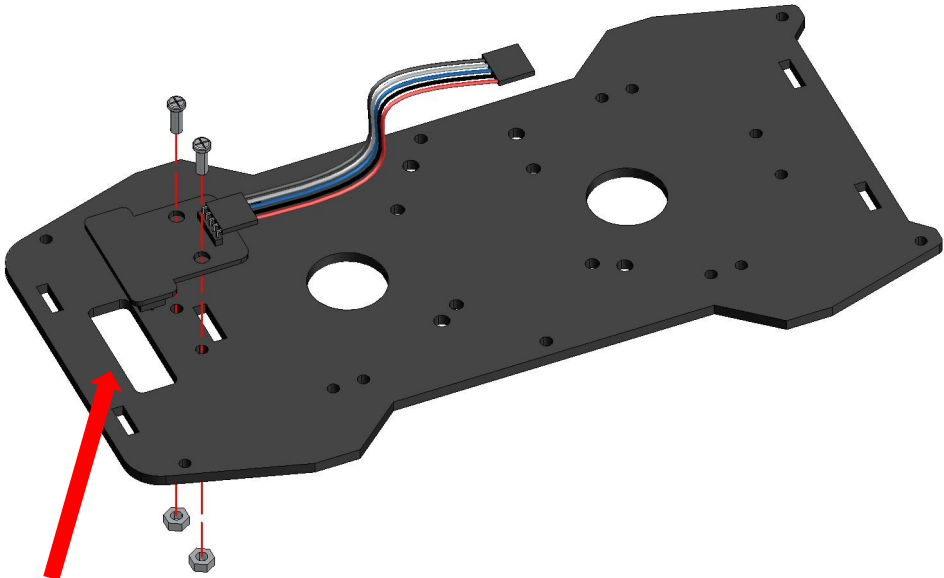
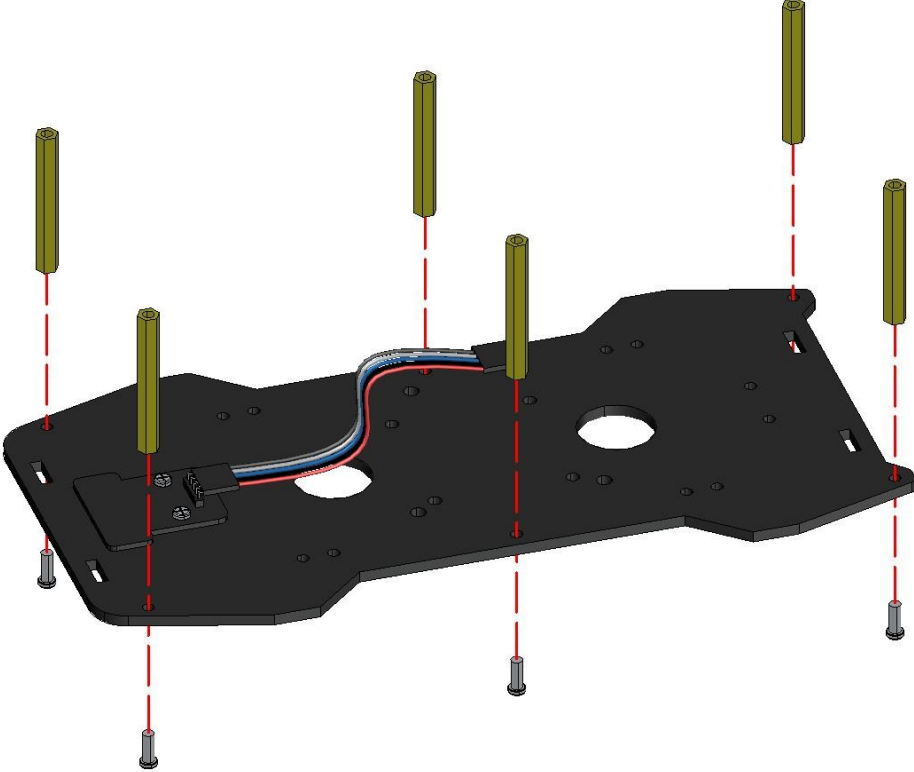
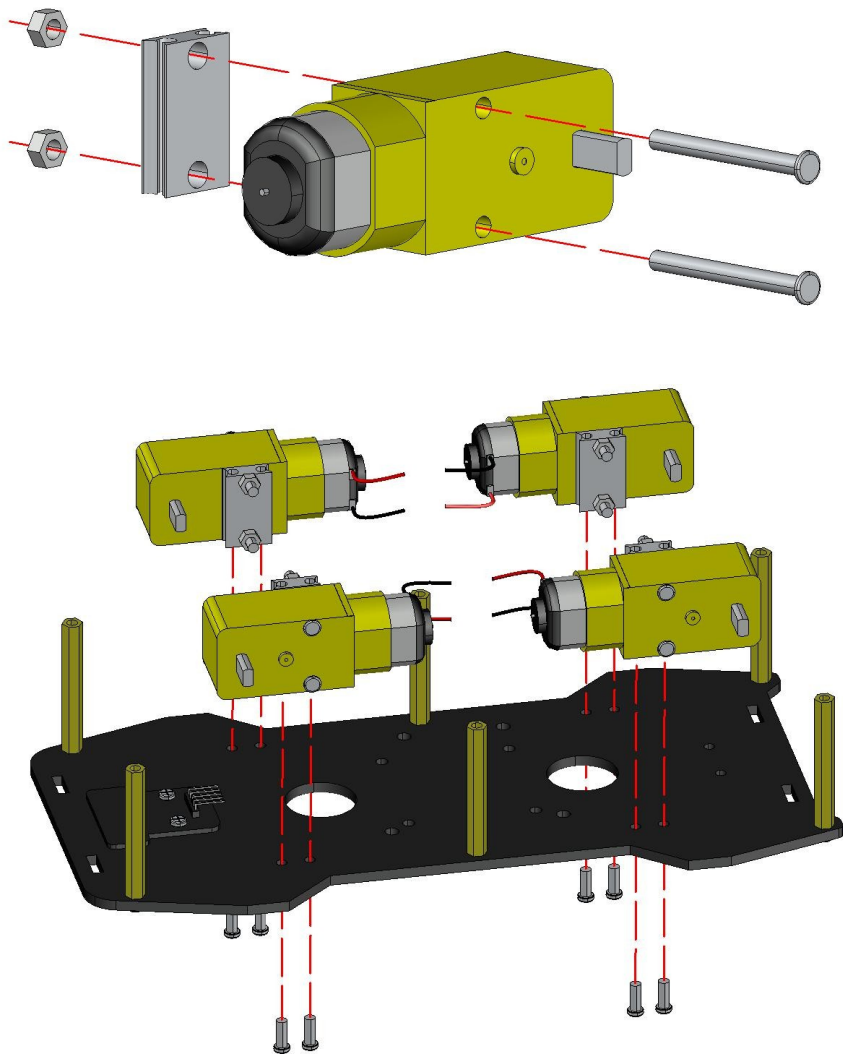


| Step 1 Installing Trace Sensor |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                         |
|--------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|
| Parts List                     | Acrylic Lower Board*1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Trace Sensor*1          |
|                                | M3*10MM Round Head Screws*2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | M3 Nickel-Plated Nuts*2 |
| Splicing Diagram               |  <p>With the hole of<br/>Trace Sensor</p>                                                                                                                                                                                                                                                                                                                                                                                 |                         |
| Notes                          | <p>1. Screwing steps: first put the nut on the screw by hand and then tighten it;</p> <p>2. Tightening method: hold down the nut and screw the screw with a screwdriver, or hold down the screw and screw the nut with a cross socket;</p> <p>3. Here first plug in the Dupont wire, the red wire connects to the V pin of the tracing sensor, the black wire connects to the G pin, the blue wire connects to the L pin, the white wire connects to the M pin, and the gray wire connects to the R pin.</p> |                         |

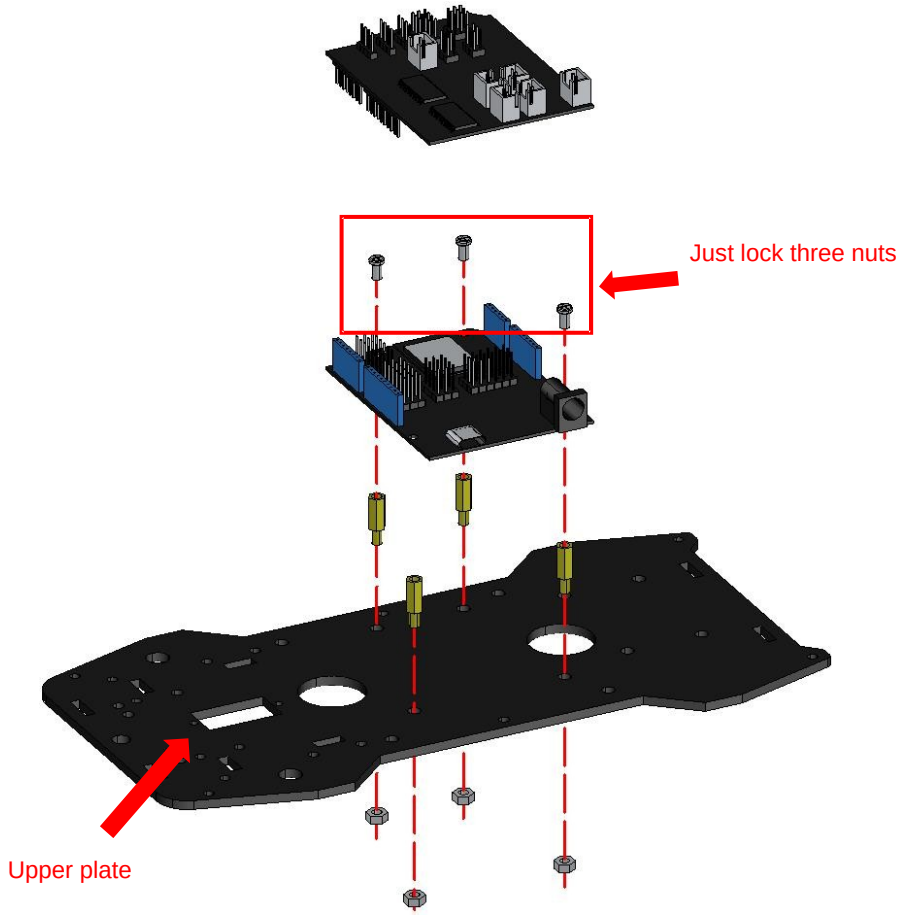
## Step 2 Installing the Copper Pillars on the Board

| Parts List       | M3*40MM Dual-pass Copper Pillar*6                                                   | M3*10MM Round Head Screws*6 |
|------------------|-------------------------------------------------------------------------------------|-----------------------------|
| Splicing Diagram |  |                             |
| Notes            | Screw the copper pillar from the bottom of the board.                               |                             |

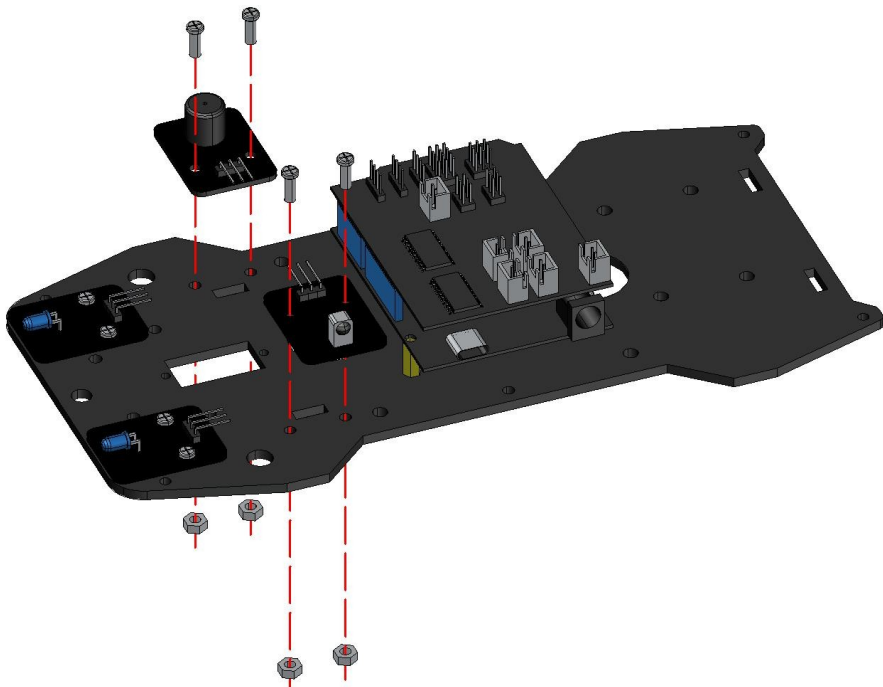
## Step 3 Installing Motor

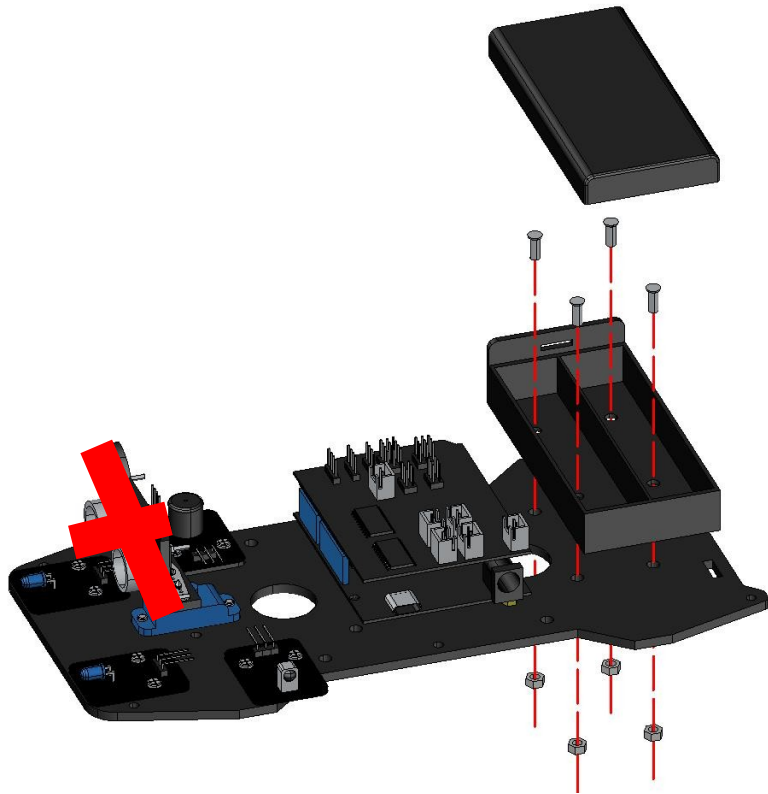
|                  |                                                                                                                                                                                                                                                                                                                                         |                  |                             |
|------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|-----------------------------|
| Parts List       | TT DC Geared Motors*4                                                                                                                                                                                                                                                                                                                   | Motor Brackets*4 | M3*30MM Round Head Screws*8 |
|                  | M3*10MM Round Head Screws*8                                                                                                                                                                                                                                                                                                             |                  | M3 Nickel-Plated Nuts*8     |
| Splicing Diagram |                                                                                                                                                                                                                                                      |                  |                             |
| Notes            | <p>1. Fix the metal bracket on the motor first</p> <p>2. The direction of motor installation should be strictly as shown in the figure, and the end of the motor belt line should be placed inward</p> <p>3. When fixing the motor, try to keep the motor level and tighten it to prevent the motor from loosening during movement.</p> |                  |                             |

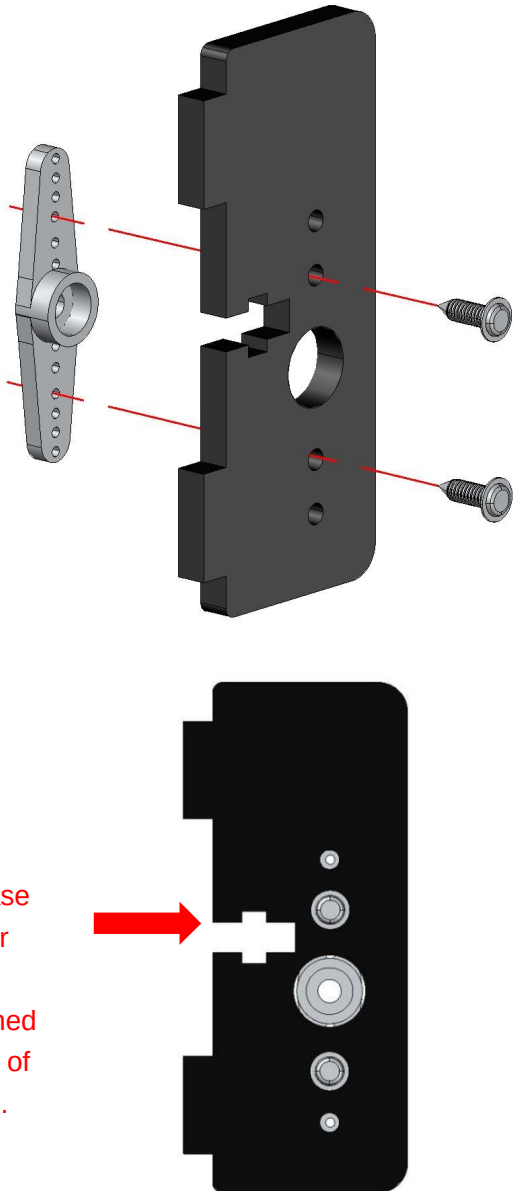
## Step 4 Installing Controller Board and Car Shield

|                  |                                                                                                                                                                                                                                                                                                                                                           |                             |                                        |
|------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|----------------------------------------|
| Parts List       | ESP32 Max V1.0<br>Controller Board*1                                                                                                                                                                                                                                                                                                                      | ESP32-Car-Shield*1          | M3*14MM Single-pass<br>Copper Pillar*4 |
|                  | M3 Nickel-Plated Nuts*4                                                                                                                                                                                                                                                                                                                                   | M3*10MM Round Head Screws*3 |                                        |
| Splicing Diagram |  <p>Just lock three nuts</p> <p>Upper plate</p>                                                                                                                                                                                                                        |                             |                                        |
| Notes            | <p>1.First, the single copper pillar is fixed on the upper board with a nut, which needs to be tightened;</p> <p>2.Then use screws to fix the ESP32 board on a single copper pillar, only three places can be fixed here as shown;</p> <p>3.Insert the car expansion board into the ESP32 controller board according to the corresponding pin number.</p> |                             |                                        |

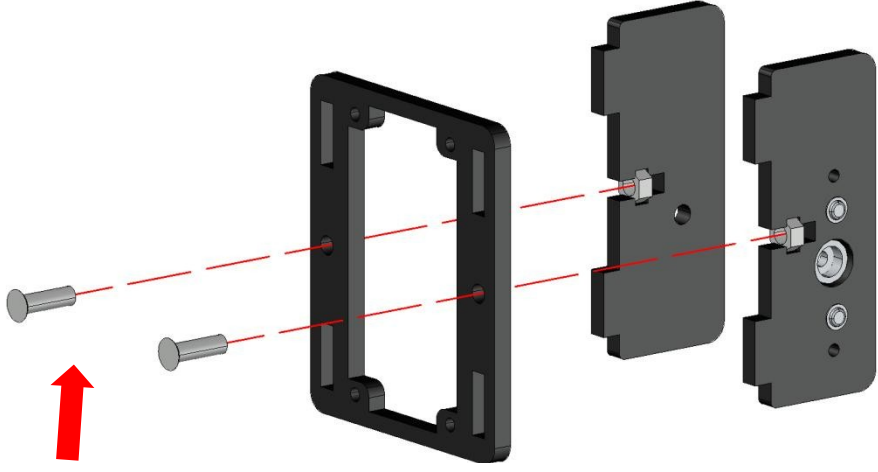
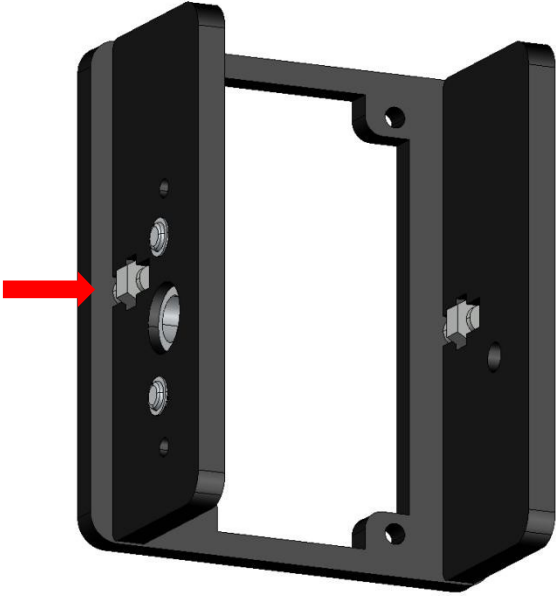
## Step 6 Installing P-Buzzer Module And IR Receiver Module

|                  |                                                                                     |                         |
|------------------|-------------------------------------------------------------------------------------|-------------------------|
| Parts List       | P-Buzzer Module*1                                                                   | IR Receiver Module*1    |
|                  | M3*10MM Round Head Screws*4                                                         | M3 Nickel-Plated Nuts*4 |
| Splicing Diagram |  |                         |

| Step 7 Installing Battery Holder |                                                                                                                            |                           |                           |
|----------------------------------|----------------------------------------------------------------------------------------------------------------------------|---------------------------|---------------------------|
| Parts List                       | 18650 Battery Holder*1                                                                                                     | M3*8MM Flat Head Screws*4 | M3MM Nickel-Plated Nuts*4 |
| Splicing Diagram                 |                                         |                           |                           |
| Notes                            | The screws in the battery case need to be tightened so that the flat head nut fits against the bottom of the battery case. |                           |                           |

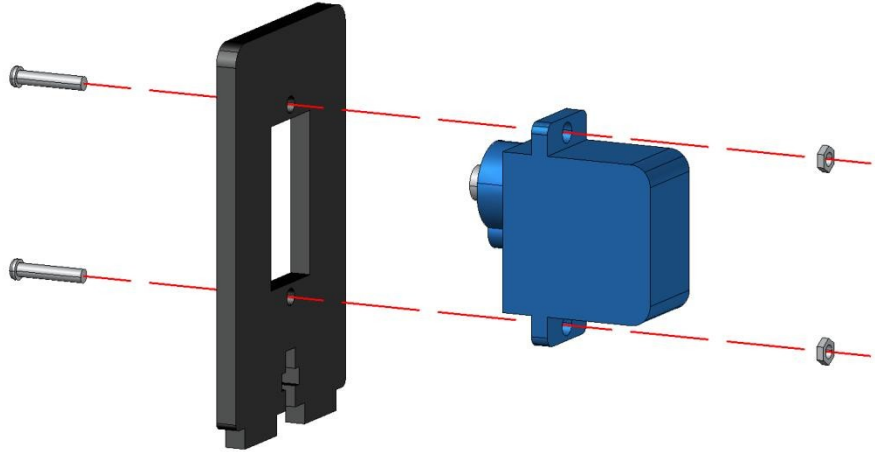
| Step 8 Install the camera module structure group ( 1) |                                                                                                                                                                                                              |                                                       |                                                     |
|-------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------|-----------------------------------------------------|
| Part Lists                                            | single-side<br>d servo<br>horn*1                                                                                                                                                                             | M1.4*5mm Large Round<br>Flat Head Tapping<br>Screws*2 | single-sided servo<br>horn acrylic fixed<br>plate*1 |
| Splicing<br>Diagram                                   |  <p>Attention: Please ensure that after installation, this notch is positioned at the upper left of the rudder plate.</p> |                                                       |                                                     |
| Notes                                                 | <p>1.This step requires tearing off all the film on the acrylic;</p> <p>2.The single rudder plate and M1.4*5mm large round flat head self-tapping screws should be taken from Step 3.</p>                    |                                                       |                                                     |

## Step 9 Install the camera module structure group ( 2)

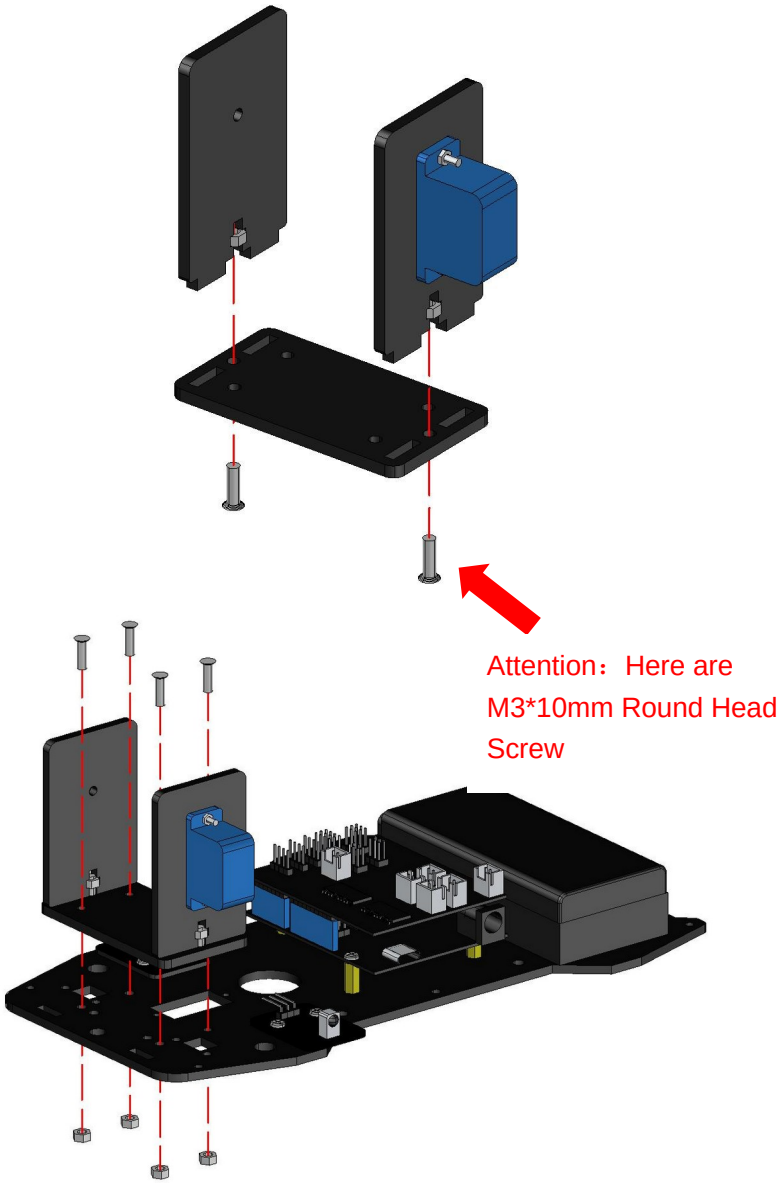
|                  |                                                                                                                                                                                                                                                                                                                                                                        |                                       |          |
|------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|----------|
| Part Lists       | M3*8mm Flat Head screw*2                                                                                                                                                                                                                                                                                                                                               | Nylon lock nut acrylic fixing plate*1 | M3 nut*2 |
|                  | Assembled single-sided servo horn acrylic fixed plate                                                                                                                                                                                                                                                                                                                  | Camera acrylic fixed plate*1          |          |
| Splicing Diagram |  <p>Attention: Here are M3*10mm countersunk screws.</p>  <p>Attention:<br/>When installing the screws here, you can use your left and right hands to hold the screw first, then tighten it.</p> |                                       |          |

## Step 10 Install the camera module structure group 3)

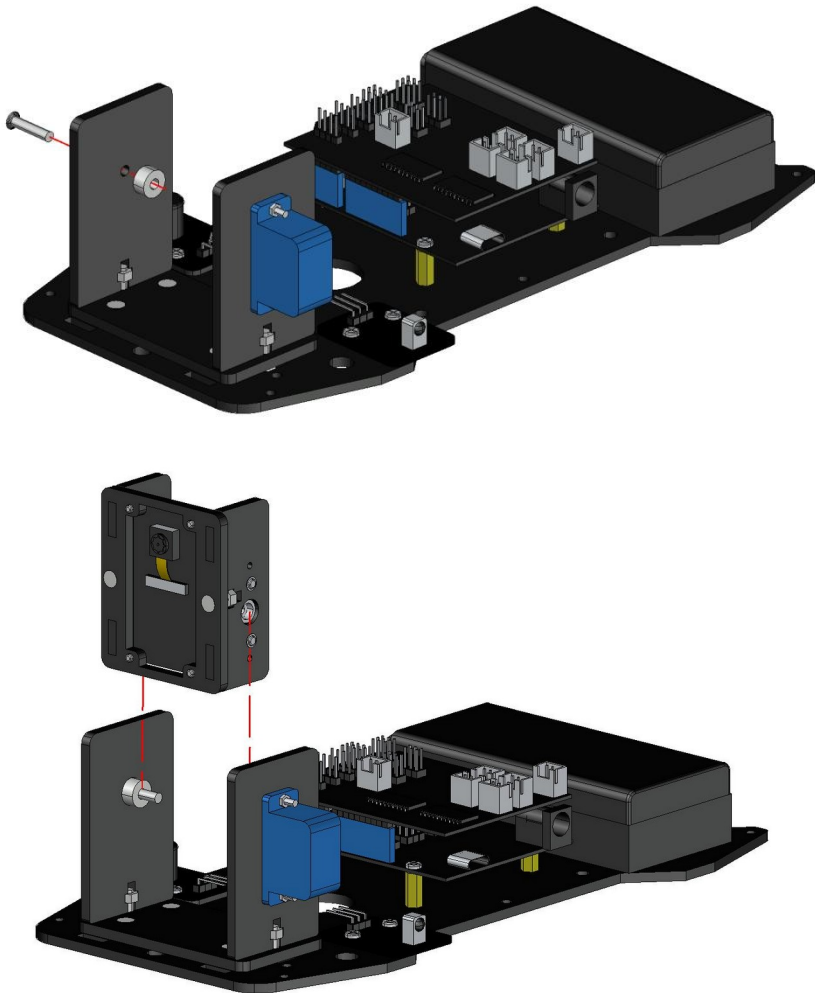
|                  |                                                                                                                                                                           |                 |                           |
|------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|---------------------------|
| Part Lists       | Assembled Camera acrylic fixed plate                                                                                                                                      | Camera module*1 | M2*8mm Round Head Screw*4 |
|                  | M2Nickel-Plated Nut*4                                                                                                                                                     |                 |                           |
| Splicing Diagram |  <p>Attention: The M2 screws should be installed from the front in this direction.</p> |                 |                           |

| Step 11 Install the camera module structure group 4) |                                                                                                                                                           |                             |                        |
|------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|------------------------|
| Part Lists                                           | SG90 Servo Module*1                                                                                                                                       | Servo acrylic fixed plate*1 | M2 Nickel-Plated Nut*2 |
|                                                      | M2*10mm Round Head Screw*2                                                                                                                                |                             |                        |
| Splicing Diagram                                     |                                                                        |                             |                        |
| Notes                                                | <p>Servo module, M2*10mm round head screws, and M2 nickel-plated nuts are removed in Step 4. Pay attention to the direction of the servo motor shaft.</p> |                             |                        |

## Step 12 Install the camera module structure group 5)

|                  |                                                                                                                                         |                                              |                            |
|------------------|-----------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|----------------------------|
| Part Lists       | M3*10mm Flat Head screw*2                                                                                                               | Square acrylic support plate*1               | M3 nut*6                   |
|                  | Bottom acrylic fixing plate*1                                                                                                           | Installed steering gear acrylic fixing plate | M3*10mm Round Head Screw*4 |
| Splicing Diagram |  <p>Attention: Here are M3*10mm Round Head Screw</p> |                                              |                            |

## Step 13 Install the camera module structure group ( 6)

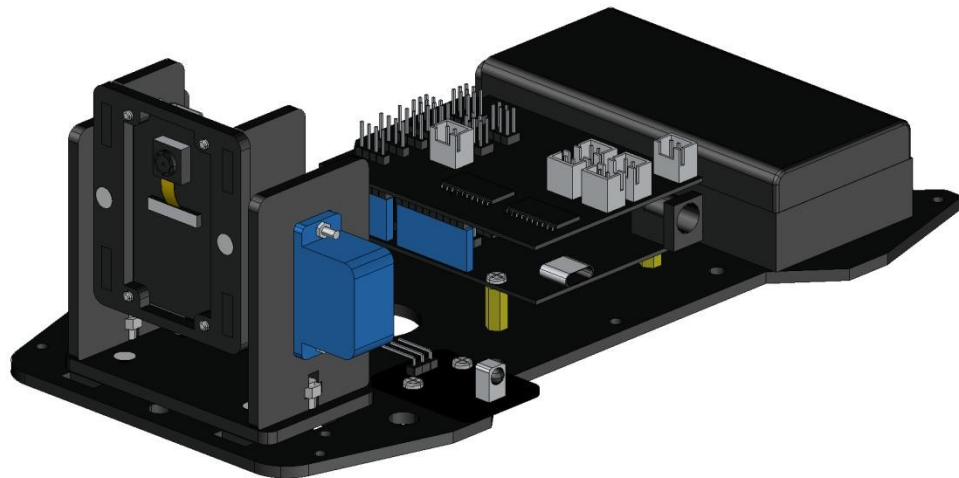
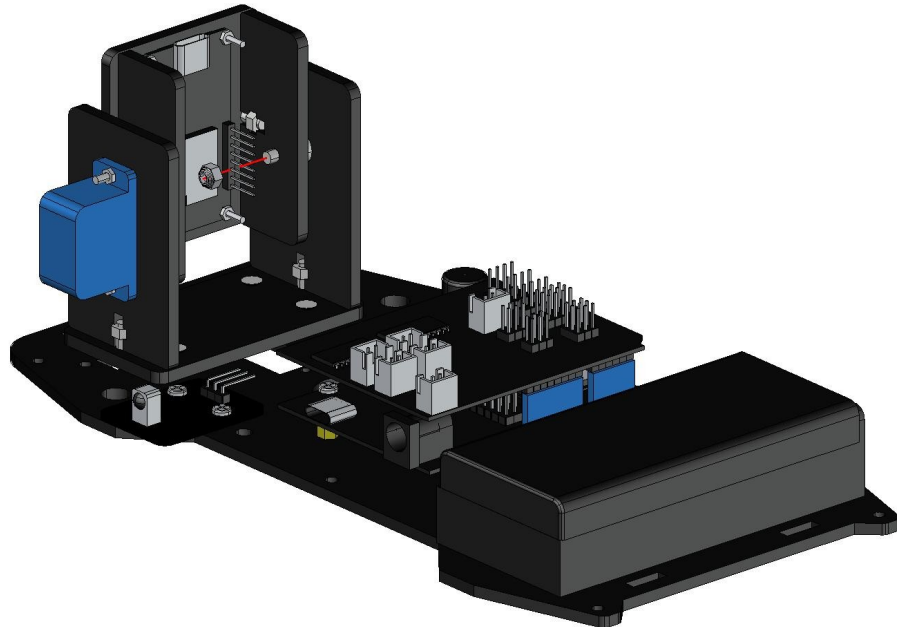
|                  |                                                                                                                                                                                                                                                                                                                                                                                                  |                              |
|------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|
| Part Lists       | M3*14mm Flat Head screw*1                                                                                                                                                                                                                                                                                                                                                                        | White ABS isolation column*1 |
| Splicing Diagram |                                                                                                                                                                                                                                                                                                               |                              |
| Notes            | <p>First, insert the M3*14mm Flat Head screw partially into the standoffs. Then place the assembled camera structure into position, ensuring the straight servo arm is aligned with the servo motor. The center of the straight servo arm does not need a screw. After aligning the holes, fully insert the screws through the round holes of the anti-loosening nut acrylic mounting plate.</p> |                              |

## Step 14 Install the camera module structure group ( 7)

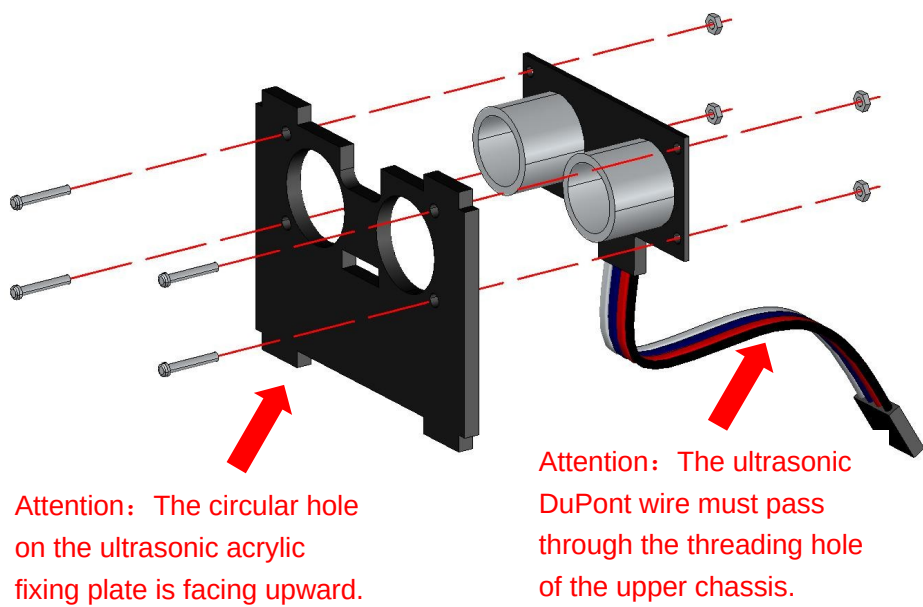
Part  
Lists

M3 Flat Head screw\*1

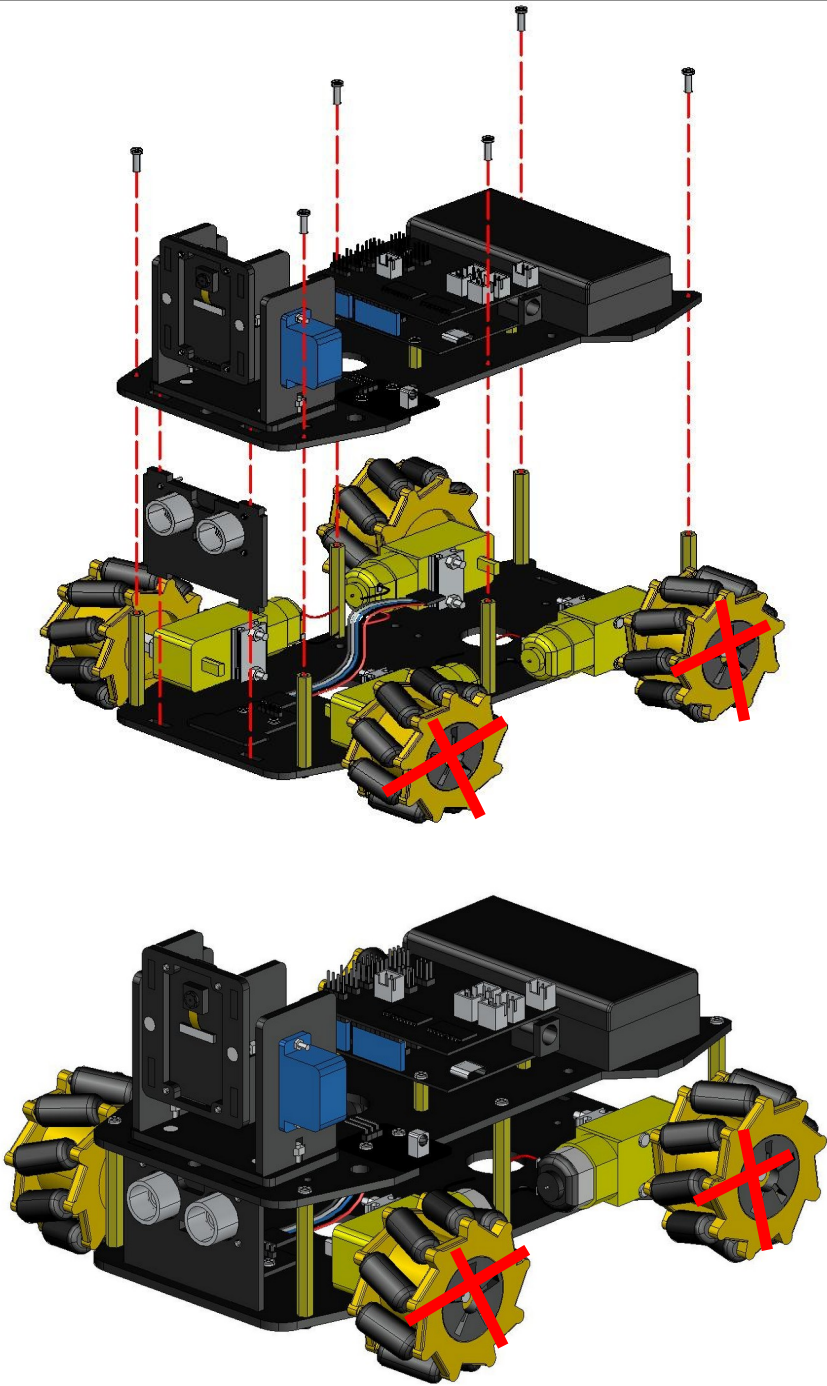
Splicing  
Diagram



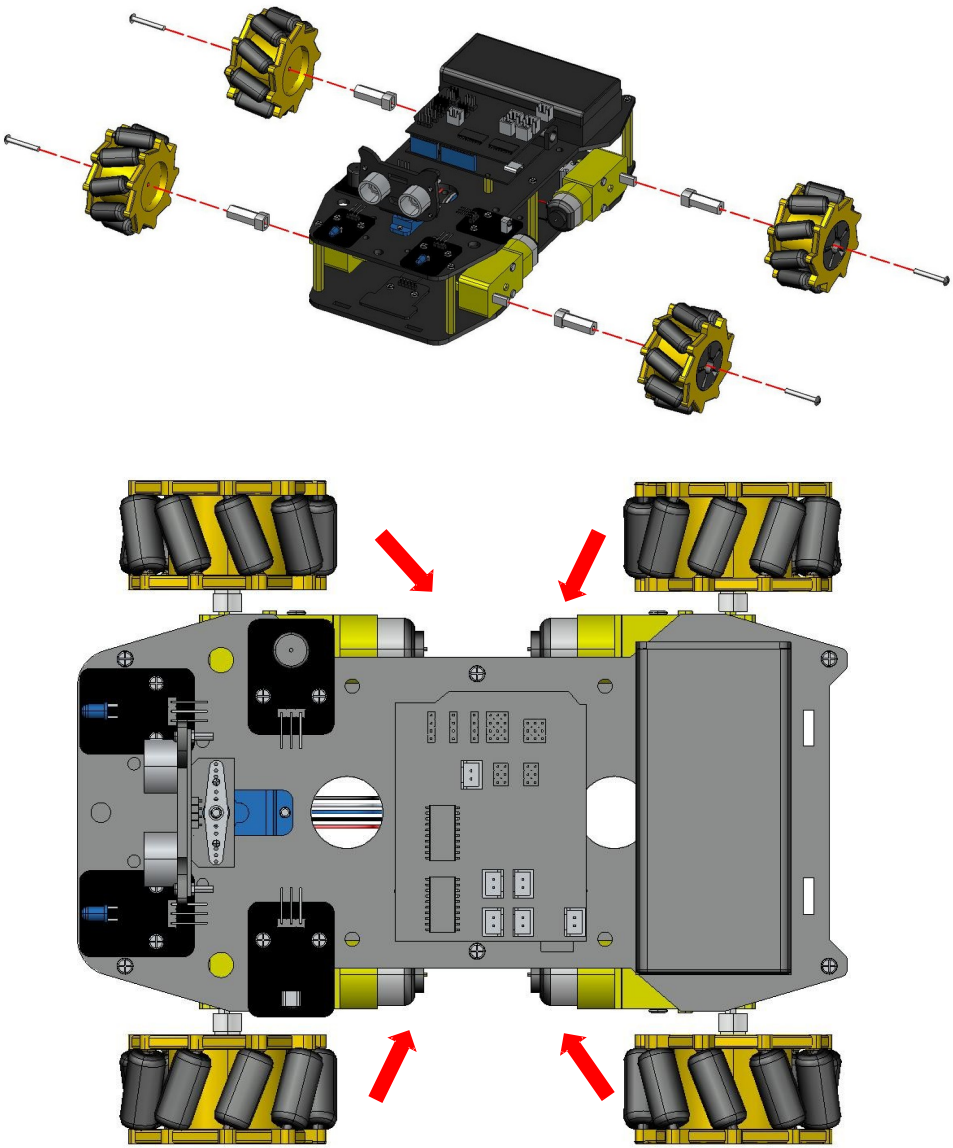
## Step 15 Install ultrasonic sensor structure

|                     |                                                                                                                                                                                                                                                                                          |                        |                               |
|---------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|-------------------------------|
| Part Lists          | ultrasonic sensor<br>acrylic fixed plate*1                                                                                                                                                                                                                                               | ultrasonic<br>sensor*1 | M2*10mm Round Head<br>Screw*4 |
|                     | M2 Nickel-Plated<br>Nut*4                                                                                                                                                                                                                                                                |                        |                               |
| Splicing<br>Diagram |  <p>Attention: The circular hole on the ultrasonic acrylic fixing plate is facing upward.</p> <p>Attention: The ultrasonic DuPont wire must pass through the threading hole of the upper chassis.</p> |                        |                               |
| Notes               | The ultrasonic sensor, M2*10mm Round Head Screws and M2 Nickel-Plated Nuts were removed using Step 2.                                                                                                                                                                                    |                        |                               |

## Step 16 Assemble the complete car body

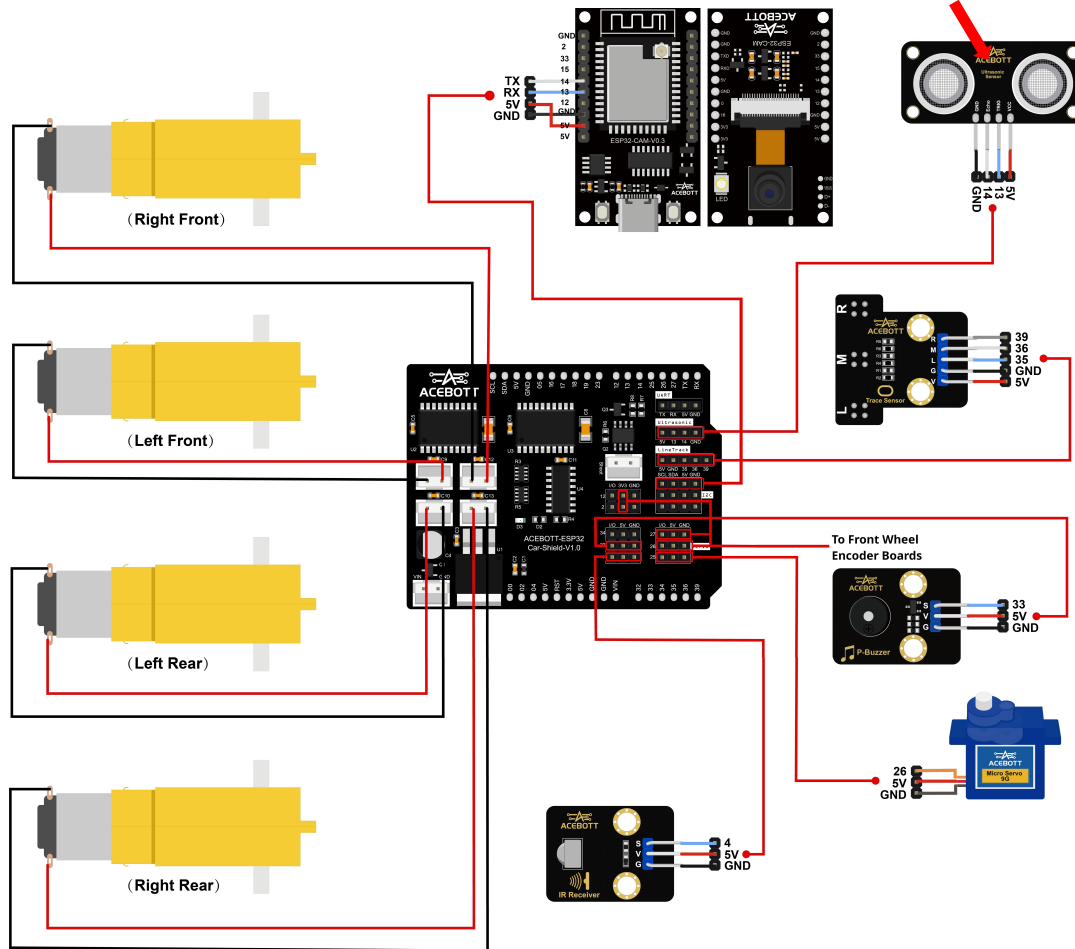
| Part Lists       | Assembled upper chassis                                                                                         | Assembled lower chassis | M3*10mm Round Head Screw*6 |
|------------------|-----------------------------------------------------------------------------------------------------------------|-------------------------|----------------------------|
| Splicing Diagram |                              |                         |                            |
| Notes            | Pass the connection cable of the upper module on the lower chassis through the round hole on the upper chassis. |                         |                            |

## Step 17 Installing Mecanum Wheels

| Parts List       | 60MM Mecanum Wheel*4                                                                                                       | Mecanum Wheel Couplings*4 | M2*25MM Round Head Self-Tapping Screws*4 |
|------------------|----------------------------------------------------------------------------------------------------------------------------|---------------------------|------------------------------------------|
| Splicing Diagram |                                         |                           |                                          |
| Notes            | The Mecanum wheel cannot be installed arbitrarily and needs to be installed strictly in the direction shown in the figure. |                           |                                          |

## Step 18 Wiring

Attention: The ultrasonic sensor may have different hardware versions, so it needs to be connected according to the actual pin identification.



- 1.The colors of the DuPont wires are blue, red, and black. The blue wire connects to the S pin, the red wire connects to the V pin, and the black wire connects to the G pin.
- 2.The servo wires are different from standard DuPont wires. The red wire connects to the V pin, the brown wire connects to the G pin, and the yellow wire connects to the S pin.
- 3.For the ultrasonic sensor wires, the red wire connects to the V pin, the white wire connects to the ECHO pin, the blue wire connects to the TRIG pin, and the black wire connects to the GND pin.
- 4.For the line tracking sensor wires, the red wire connects to the 5V pin, the black wire connects to the GND pin, the blue wire connects to the L pin, the white wire connects to the M pin, and the gray wire connects to the R pin.
- 5.Pin 14 of the camera module is connected to the SCL pin of the esp32 controller board, and pin 13 is connected to the SDA pin.