



SainSmart InstaBots  
2-Wheel Self-Balancing  
Upright Rover Car Robot Kit Pro

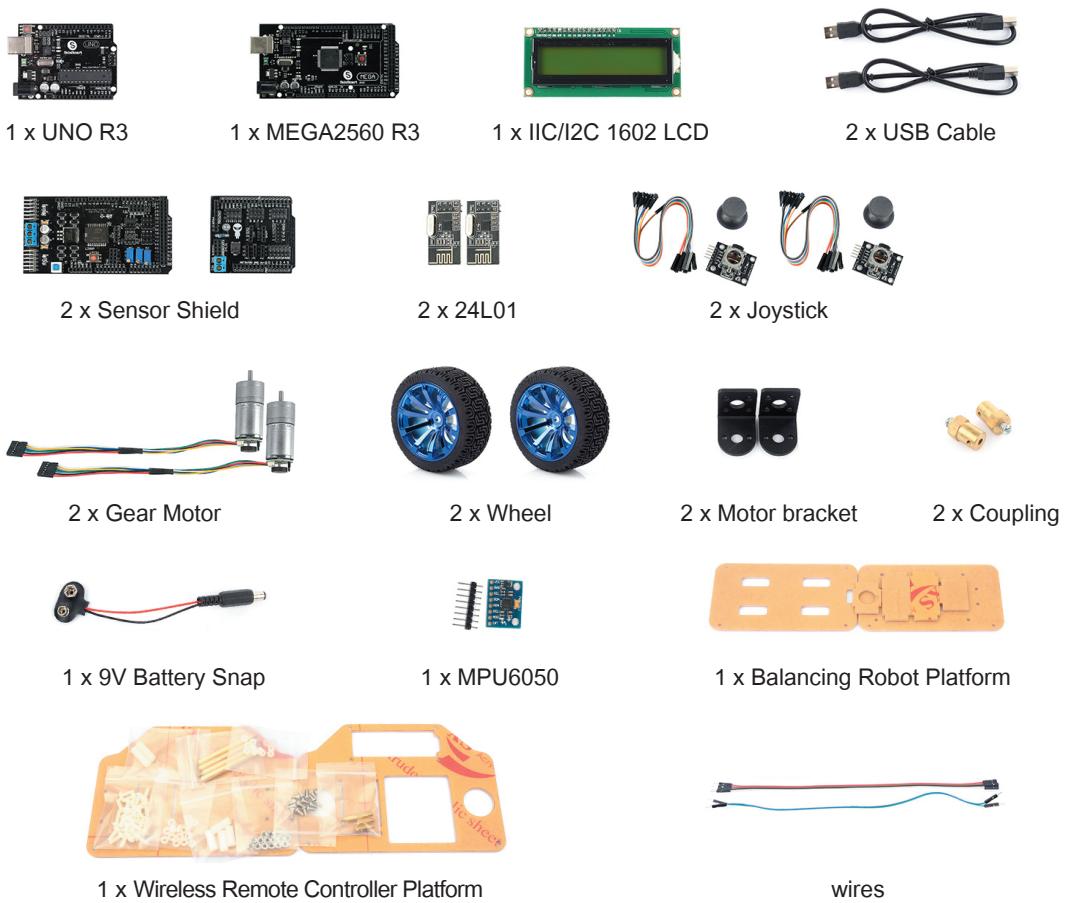
## Instruction Manual



Download the code  
from product page

[WWW.SAINSMART.COM](http://WWW.SAINSMART.COM)

### Package Contents



\* Batteries are not included

### Wiring

#### Battery:

Positive electrode -> +11.1V  
Negative electrode -> GND

#### Board:

MOTOR+(red) -> 12V+  
MOTOR -(black) -> 12V-  
GND(green) -> GND  
Vcc(blue) -> 5V  
A Vout(yellow) -> PWM A  
B Vout(white) -> PWM B

#### Remote control(left):

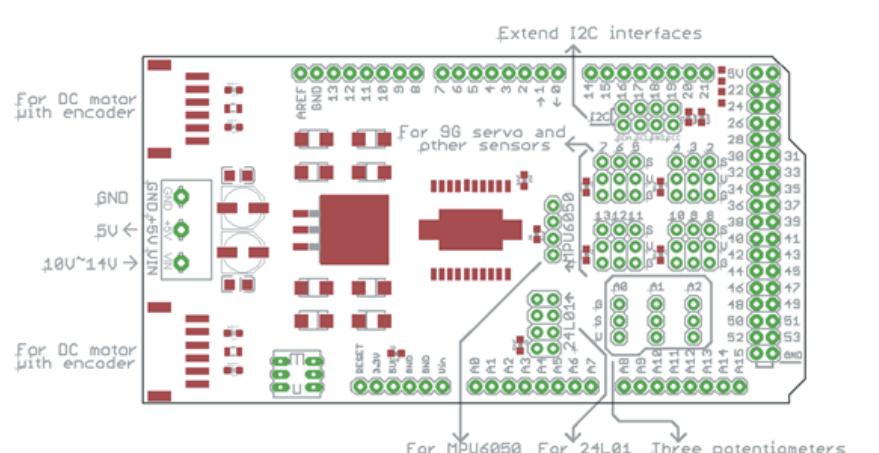
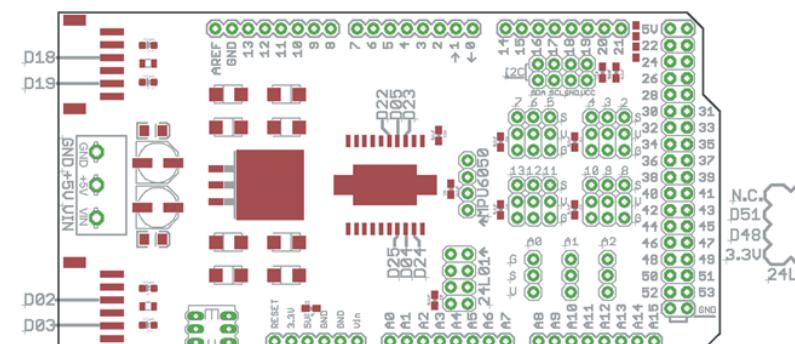
GND -> G  
+5V -> V  
VRx -> A3  
VRy -> A2  
SW -> D3  
  
**Remote control(right):**  
GND -> G  
+5V -> V  
VRx -> A1  
VRy -> A0  
SW -> D2

### Attention

- Robot: 11.1V Li-Po battery is the best power source for the robot, but other types of batteries can be used. Ensure that the voltage of the battery is between 10V to 13V;
- Remote control: Use a 9V battery for the remote controller;
- Connect/ make sure that the NRF24L01 wireless module and MPU6050 module has been inserted into the shield board.
- Programme Remote\_Controller\_V3 and Upright\_Rover\_V3(provided) into arduino UNO and arduino mega2560 via USB cable. Since USB cable doesn't have enough power supply to run the robot, so please connect to 11.1V Li-Po battery when testing.
- You can wireless control the robot before it balances.

### Parts and Components

V3 Shield Schematics



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### Motor

MODEL: JGA25-370-12V-201rpm

#### 1. Standard Operating Conditions

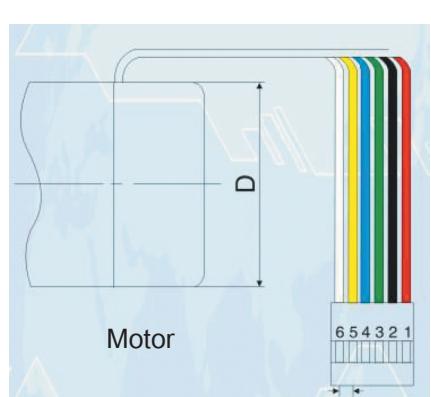
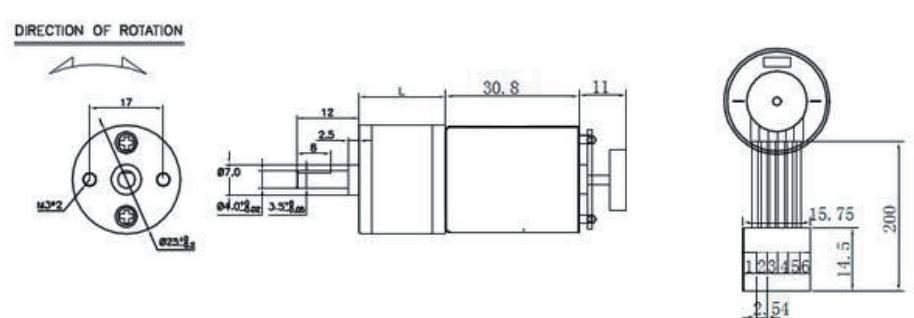
Rated Voltage:  
Direction of Rotation:  
Operating Temperature and Humidity:  
Storage Temperature:  
12V DC constant between motor terminals  
CW when viewed from output shaft side  
Temperature range of -10 °C ~+50 °C  
Humidity range of  
Temperature range of -20 °C ~+60 °C

#### 2. Measuring Conditions

Motor Position:  
Power Supply:  
Environmental Temperature and Humidity:  
To be placed horizontally when measuring  
Regulated DC power supply  
Temperature range of 15 °C to 30 °C  
Relative humidity 30%and 70%

#### 3. Electrical Characteristics (at initial stage after 30 seconds run-in)

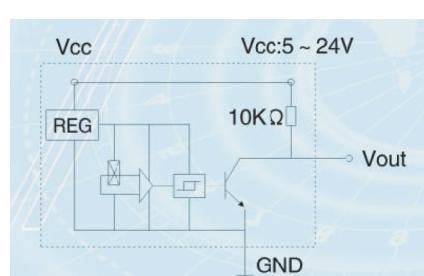
No Load Current:	50±5% mA
No Load Speed:	01±5% rpm
Starting Voltage:	1.5 V
Rated Load:	0.53Kg.cm
Rated Load Current:	250±5% mA
Rated Load Speed:	160±10% rpm
Stall Current:	900±5% mA
Maximum torque:	2.8Kg.cm
Power:	1.25 w
External Appearance:	Attached Outline Drawing
Shaft End Play:	0.5~0.3 mm
Weights: Approx:	100g
LOCKED ROTO R:	OK
Life:	>500H



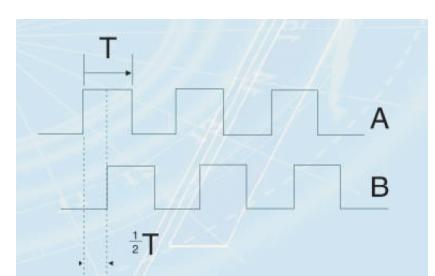
#### Encoder Wiring:

- MOTOR+
- MOTOR-
- HALL SENSOR GND
- HALL SENSOR Vcc
- HALL SENSOR A Vout
- HALL SENSOR B Vout

Dmm	12	16	20	24	28	36	42
A , B	3	3	12	12	16	16	18



Output Circuit

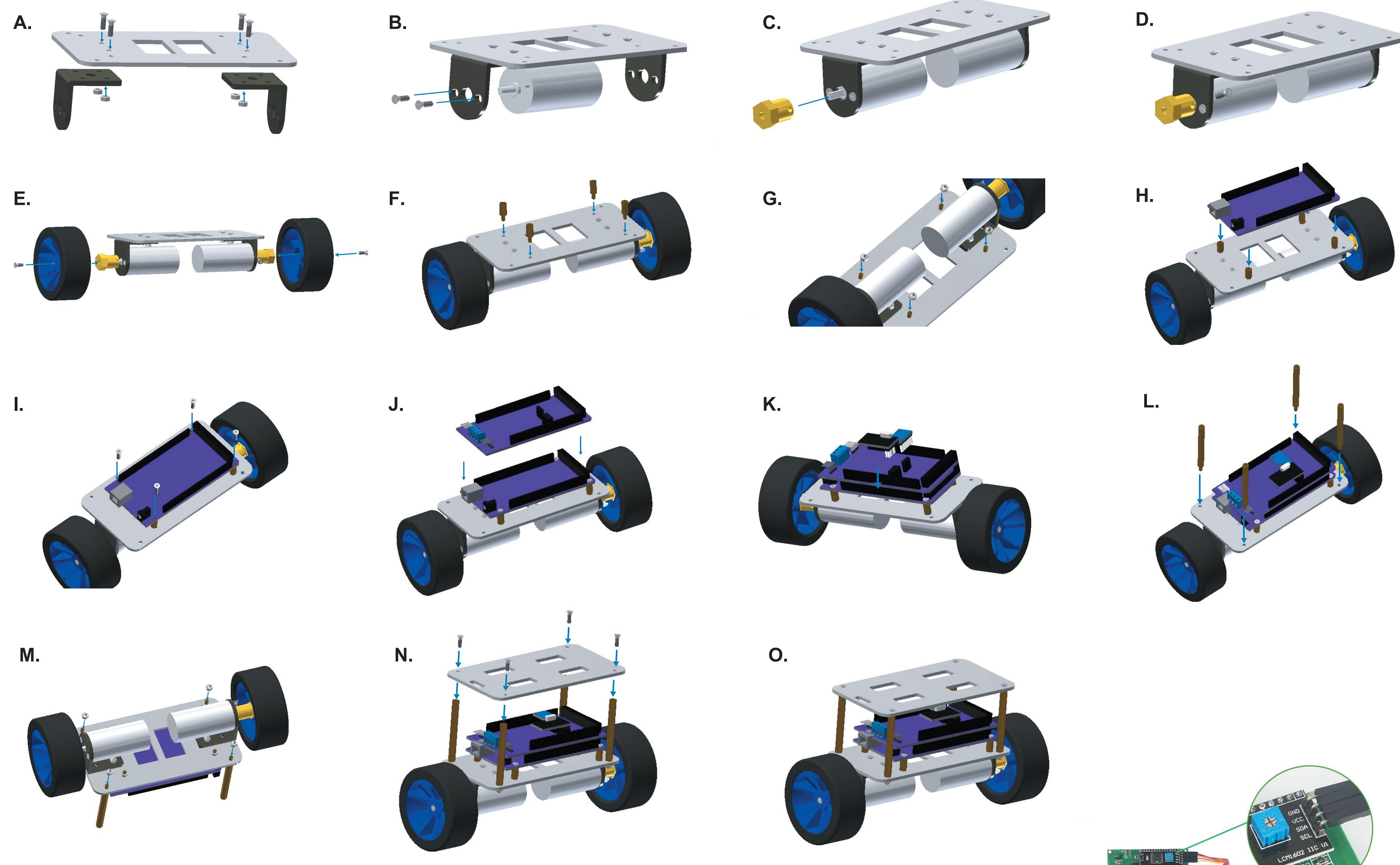


Output Waveform

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## Connection



## Remote controller

