

User Manual

DrawingRobot by Group-21

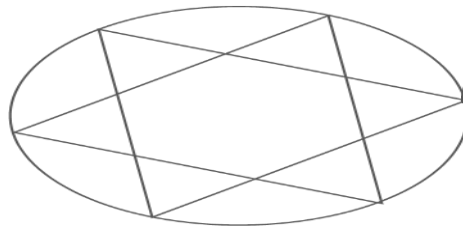
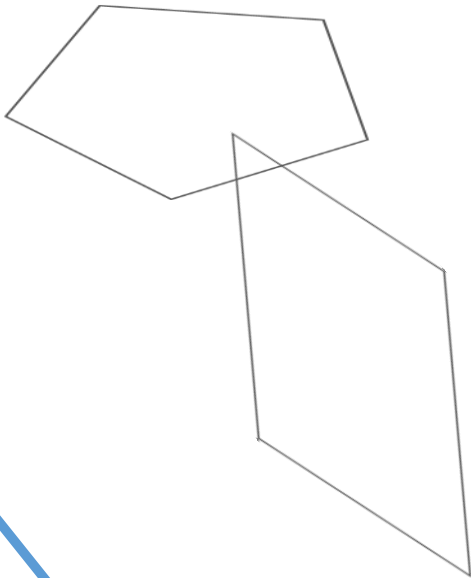


TABLE OF CONTENTS

| | | |
|----------|---|-----------|
| 1 | INTRODUCTION | 2 |
| 1.1 | Background | 2 |
| 1.2 | Object | 2 |
| 2 | PRODUCTION INFORMATION | 3 |
| 2.1 | Operation Platform | 3 |
| 2.2 | Specifications | 3 |
| 2.3 | Running Environment | 3 |
| 2.4 | Performance | 3 |
| 3 | USE-METHOD | 4 |
| 3.1 | Preparation | 4 |
| 3.2 | Turn on the robot | 4 |
| 3.3 | Bluetooth pairing | 4 |
| 3.4 | Drawing | 5 |
| 3.5 | Turn off the robot | 7 |
| 3.6 | Example of drawing a 3 * 5cm rectangle | 7 |
| 4 | ERROR HANDLING | 9 |
| 4.1 | Bluetooth can't be paired | 9 |
| 4.2 | Unable to connect Bluetooth serial port | 9 |
| 4.3 | A sudden interruption | 10 |
| 5 | CONTACT INFORMATION | 11 |

1 INTRODUCTION

1.1 Background

This project tests our practical design and implementation skills. It gives us an opportunity to take a product design from the very beginning all the way through to a working prototype stage and will make practical use of the knowledge we have gained so far in our lecture courses.

1.2 Object

To implement the precision of drawing, and make the process of drawing more efficient.

2 PRODUCTION INFORMATION

2.1 Operation Platform

Arduino UNO R3

2.2 Specifications

With shell: 30*15*16cm

No shell: 14.5*11*13cm

2.3 Running Environment

Software: Windows XP/7/8/8.1/10

Hardware: Horizontal plane

2.4 Performance

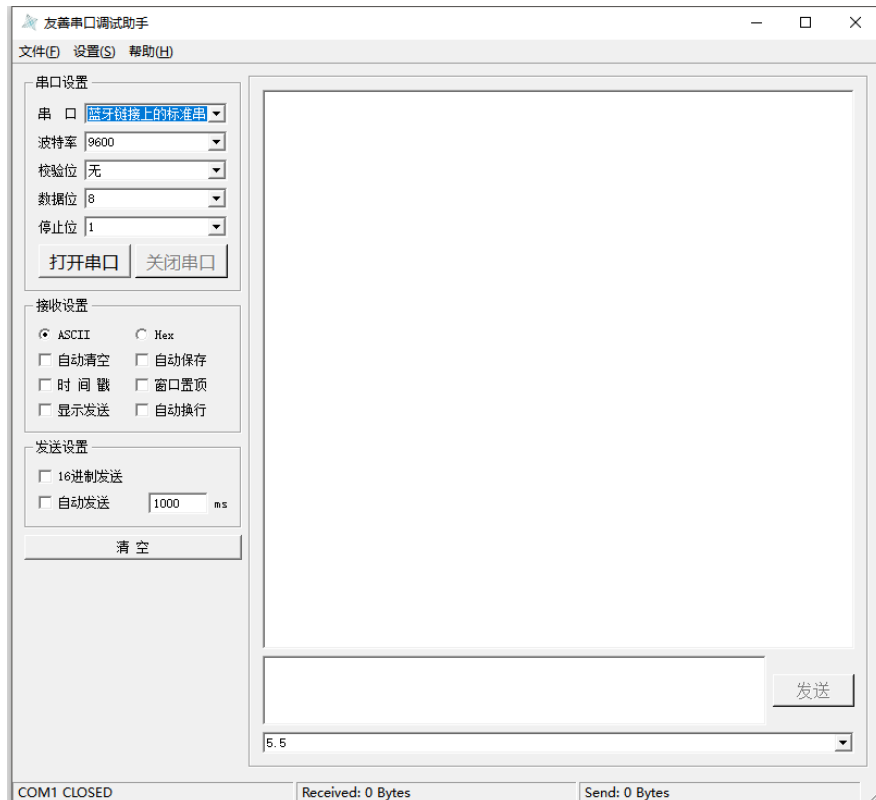
Drawing speed: 2cm per second (max speed)

Average error: $\pm 1\text{mm}$

3 USE-METHOD

3.1 Preparation

1. 4 AA batteries: You need 4 AA batteries as DrawingRobot's power.
2. A computer with Bluetooth: You need a computer which has Bluetooth to connect the robot for operating.
3. Download the Serial Assistant: You need a serial assistant to communicate with DrawingRobot's Bluetooth serial port.



Download link: <http://thereisnothingtodownload.com/>

3.2 Turn on the robot

1. Install the 4 AA batteries into the battery box under the robot chassis.
2. And turn on the switch on the right side of the robot. If the robot is on, you will see a red light flashing.

3.3 Bluetooth pairing

1. Turn on the Bluetooth of the computer and match the device named DrawingRobot.

蓝牙和其他设备

音频



已配对

其他设备



DrawingRobot

已配对



已连接到 USB 3.0

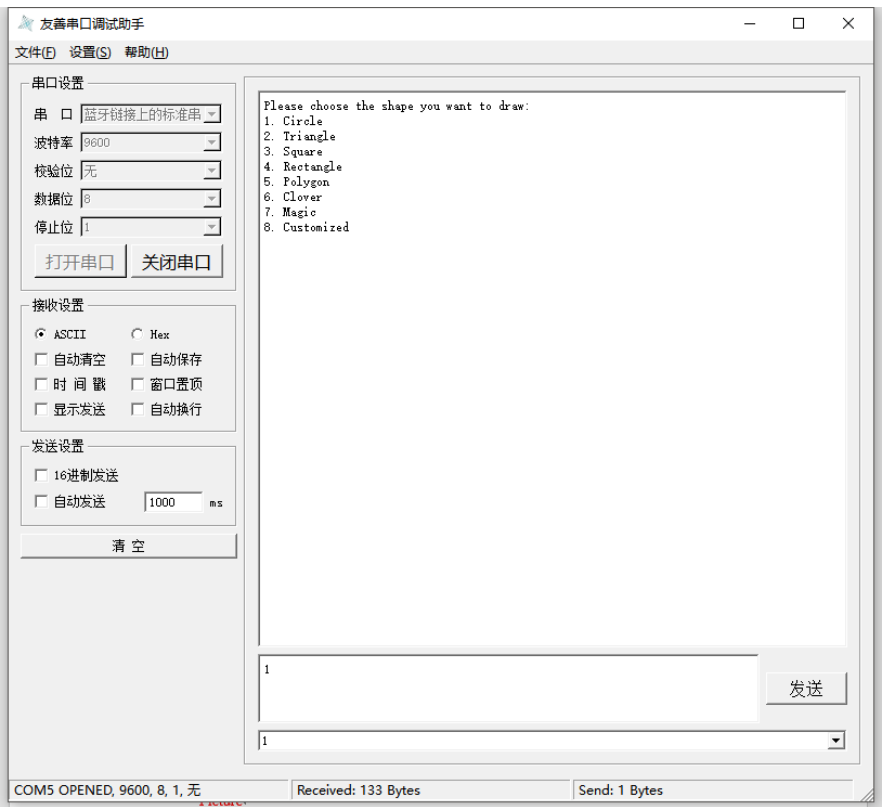
2. Open the Serial Assistant and open the serial port of DrawingRobot. (You can find out how to get the COM of DrawingRobot in ‘Error Handling’, ‘Unable to connect Bluetooth serial port’)

3. When the Bluetooth pair is successful, the red light will stay on.

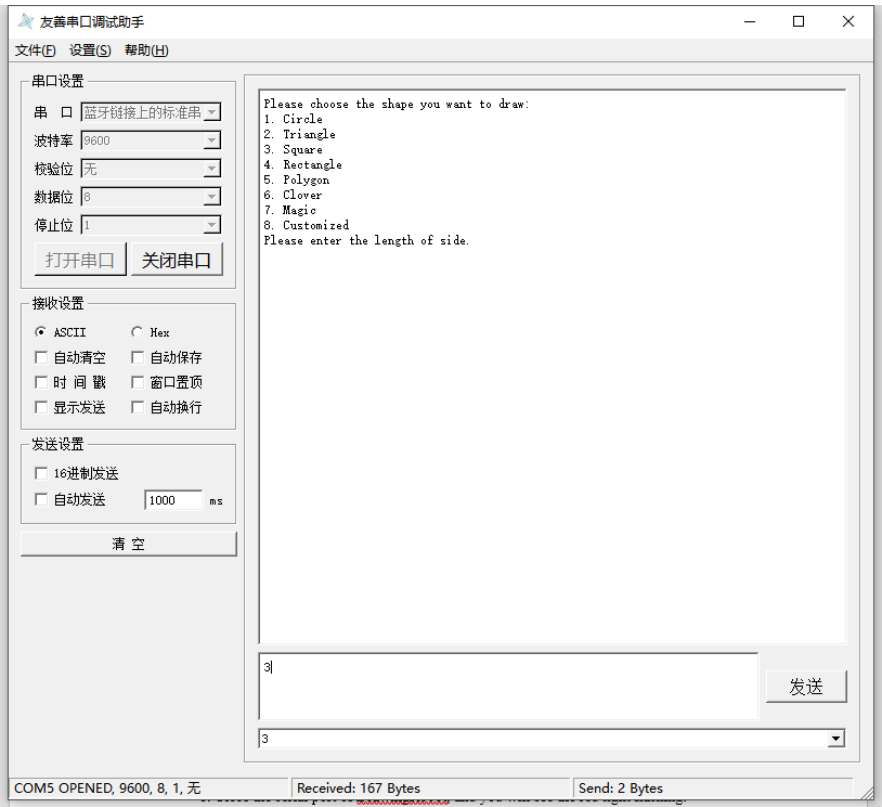
3.4 Drawing

1. Put the DrawingRobot on the paper you want to draw.

2. Send “1” to start up the DrawingRobot, and if successful, you will see some options appear in the window.



3. Send the number of option which you want to select to draw.



4. Send the parameter the program need.

5. Waiting for the drawing process complete.
6. Drawing again or turn off the robot.

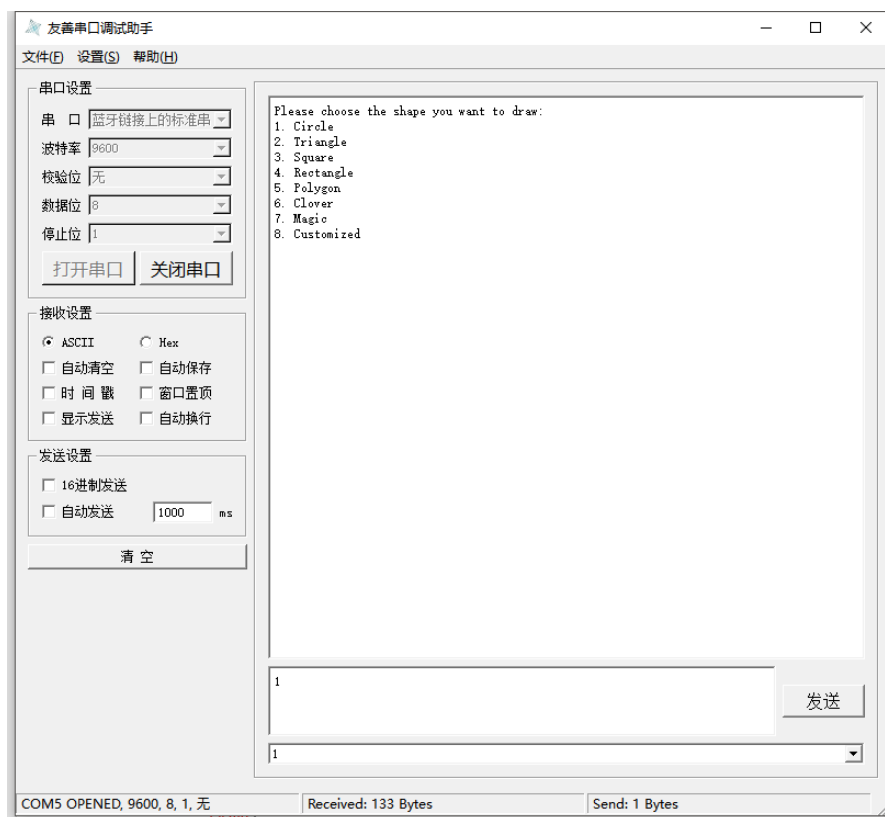
3.5 Turn off the robot

1. Close the serial port of DrawingRobot, and you will see the red light flashing.
2. Turn off the switch of robot.

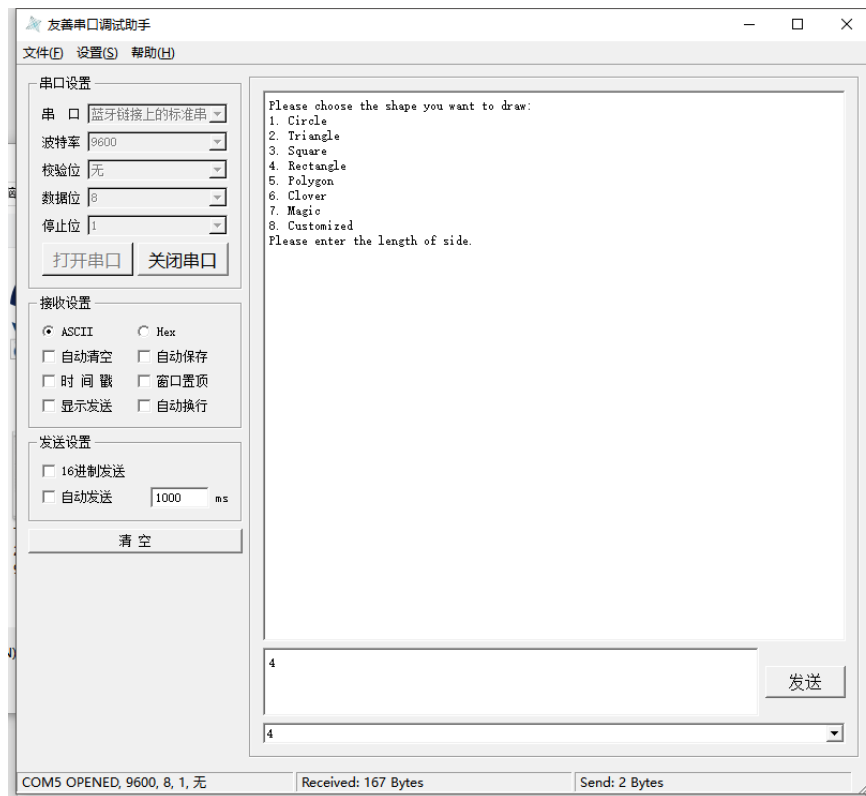
3.6 Example of drawing a 3 * 5cm rectangle

Here is an example of drawing a 3 * 5cm rectangle:

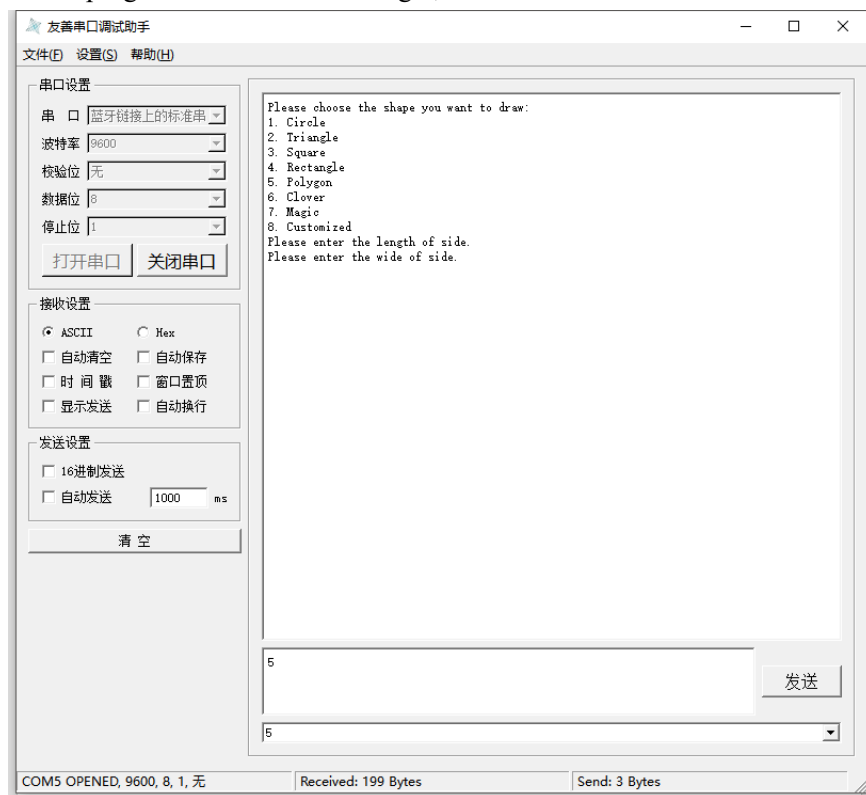
1. Send “1” to start up the robot.



2. Send “4” to select the option which can draw rectangle.



3. The program will ask for the length, and send “5”.



4. Then it will ask for the wide, and send “3”.

5. Waiting for completing.

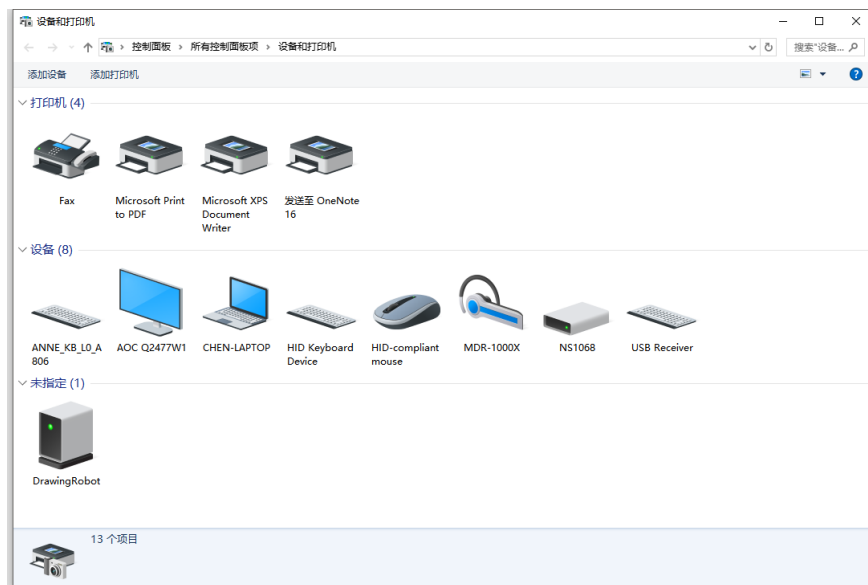
ERROR HANDLING

3.7 Bluetooth can't be paired

- Turn off other Bluetooth device.
- Restart the robot and pair the Bluetooth again.
- Check if the batteries are fully charged.

3.8 Unable to connect Bluetooth serial port

- Open the Control panel on computer and find equipment and printers plane.



- Double click on the device named “DrawingRobot”.
- Click the “Service” plane, and check the number of COM of Bluetooth Service.



- Re choose the service and exit plane.
- Try to connect again.

3.9 A sudden interruption

- Check if the batteries are fully charged.
- If the device has suffered a collision, it may be an internal problem, please contact customer service, and do not try to repair without authorization.

If you still have problems, please contact the customer service.

4 CONTACT INFORMATION

Address: Beijing University of Posts and Telecommunications
No.10 Xitucheng Road, Haidian District, Beijing, China

Postcode: 100876

Telephone number: (86) 10 4321-1234