

SJ603-A Robotic Arm Manual



Robot Anno (Shenzhen) Co., Ltd

February 2021

this manual is the operating instructions for users of SJ603-A manipulator.
Revision date: February 2020

For sales and technical support, please contact Robot Anno(Shenzhen) Co., Ltd.

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Statement

Respected users:

Thank you for purchasing and using RobotAnno products. For your safety and benefit, please read the user manual and all the random information before using the product. If you do not operate and use the product in accordance with the user's use manual, resulting in any personal injury, property or other loss, Robot Anno(Shenzhen) Co., Ltd. will not be liable.

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If you have any problems, please call +86 0755-36950696.

Robot Anno(ShenZhen) Co., Ltd reserves the right to explain and modify the user's manual. the revision, update and explanation of the manual will be published on the RobotAnno website (<http://www.robotanno.com/>), please note.

Thank you!

Robot Anno (Shenzhen) Co., Ltd
2,021 years

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 强制

A comprehensive description of the use of RobotAnno 603 arm is given in this specification. Be sure to operate the arm on the basis of careful reading and full understanding.

 注意

The drawings and photos in the instructions are representative examples and may differ from the products purchased.

- Specifications are sometimes modified appropriately for reasons such as product improvements, specification changes and easier use of the specifications themselves. the revised instruction manual will update the version number below the cover and issue in a revised version.

Please contact our sales department to order the instructions for breakage and loss.

Customer unauthorized product transformation, not within the scope of our warranty, the company is not responsible.

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I. Safety precautions

thank you for purchasing our RobotAnno manipulator. For your safety and prevent damage to the manipulator, please read and master this manual and other ancillary materials before using the RobotAnno manipulator, and start using it after you are familiar with all equipment knowledge, safety knowledge and precautions, and pay special attention to the following safety signs.

1. symbols and their meanings



危險

Misoperation is dangerous and may result in



注意

Misoperation is dangerous and may result in moderate injury, minor injury or damage to objects.



強制


Compliance in manuals and documents



禁止

Matters expressly prohibited in manuals

Even matters belonging to the category of "attention" will have serious consequences because of different circumstances, so any "attention" matters are extremely important, please strictly abide by.

 Although not in accordance with "attention" or "danger ", in order to ensure safe and effective operation, the user must also comply with the matter, will be described in the relevant place.

2. hazardous matters



(1) In case of emergency, press the emergency stop button immediately, if the brake arm can not be timely, it may cause personal injury or equipment damage accident.



Stop button

(2) When the servo power supply is switched on after the emergency stop is lifted, the emergency stop key should be started after the accident causing the emergency stop.



Release from emergency

(3) When moving within the range of the manipulator, observe the following:

- 1) consider the strain scheme when the manipulator suddenly moves to its position.
- 2) make sure to set up a shelter, just in case.



The mechanical arm action caused by misoperation may cause personal injury accident.

(4) Make sure that no one is within the range of the action of the manipulator and

that the operator is operating in a safe position when:

- 1) RobotAnno the arm is connected to the power supply.
- 2) use G code to operate the manipulator.
- 3) trial run time.
- 4) show again.

(5) Please do not move and maintain the arm while the arm is in operation. If you want to move and maintain, please turn off the power of the arm before doing this operation.



Accidental entry into the manipulator action range or contact with the manipulator may cause personal injury. If you find an exception, press the stop button immediately.

Emergency stop key is located on the right side of the front of the RobotAnno 603 manipulator electrical control box.

3. Notes

(1) The following shall be checked in front of the RobotAnno arm and, if any, repaired or other necessary measures shall be taken in a timely manner.

- 1) electrical cables are properly connected;
- 2) electrical cable skin damage;
- 3) the emergency stop switch is in the state of release;
- 4) arm movement is abnormal, abnormal noise.

(2) The owner and operator of the RobotAnno arm must be responsible for their own safety. Any robot reminds users to wear safety protection equipment and comply with safety regulations when using manipulator products.

(3) Do not modify the mechanical arm

Do not rebuild the mechanical arm, due to unauthorized product transformation caused by accidents or failures, not within the scope of our warranty,

the company is not responsible.

(4) Do not approach the running arm

Do not approach the running arm to prevent accidental injury or damage to the arm.

(5) Please specify those responsible for oversight

In order to prevent manual adjustment errors or accidents caused by inadequate safety confirmation, when more than two people operate, please specify the supervisor.

(6) Use the RobotAnno arm on the basis of an understanding of the "warning sign" of the instruction manual for the use of the arm.

4. use of the environment

(1) Do not place the mechanical arms in harsh conditions. Soil, scrap, high temperature will damage internal devices.

(2) After using the mechanical arm, the power cord plug shall be unplugged and the mechanical arm shall be placed at a dry and normal temperature. High temperature and harsh environment damage the internal devices of the manipulator.

(3) RobotAnno arm may not be used in:

- 1) close to flammable substances
- 2) an explosion
- 4) water or other liquid
- 5) the presence of corrosive, flammable gases
- Environment 6) temperatures above 40 degrees Celsius
- 7) other harsh environment

5. safety operating procedures

(1) Control the movement of the manipulator

1) the movement of the manipulator should be adjusted at a lower rate in front of the operating manipulator to increase the effective control of the manipulator.

2) consider the movement trend of the manipulator before pressing the power key.

3) should consider the trajectory of the manipulator in advance and confirm that the line is not interfered.

4) the area around the arm must be clean, free of oil, water and impurities.

(2) Production and operation

Before 1) boot, you must know all the tasks the manipulator will perform according to the program.

2) shall know the position and status of all switches, sensors and control signals that will affect the movement of the manipulator.

3) must know the position of the emergency stop buttons on the manipulator control device, ready to press these buttons in case of emergency.

4) never think that the robot arm has been completed without moving its program. Because the arm is probably waiting for the input signal to move on.

6. routine maintenance and storage

RobotAnno the arm is safe to use and can adapt to the environment to the maximum extent. Please follow the instructions. Please be sure to follow the precautions in this manual.



- (1) Never force the shaft of the mechanical arm, or it may cause personal injury and equipment damage.
- (2) Avoid temperatures below or above 20 degrees Celsius;
- (3) Avoid long-term placement in direct sunlight;
- (4) Avoid dirt and dusty environments;
- (5) Stay away from strong vibration environments;
- (6) Stay away from high humidity;
- (7) Stay away from the electrostatic environment.

II. Preparation:

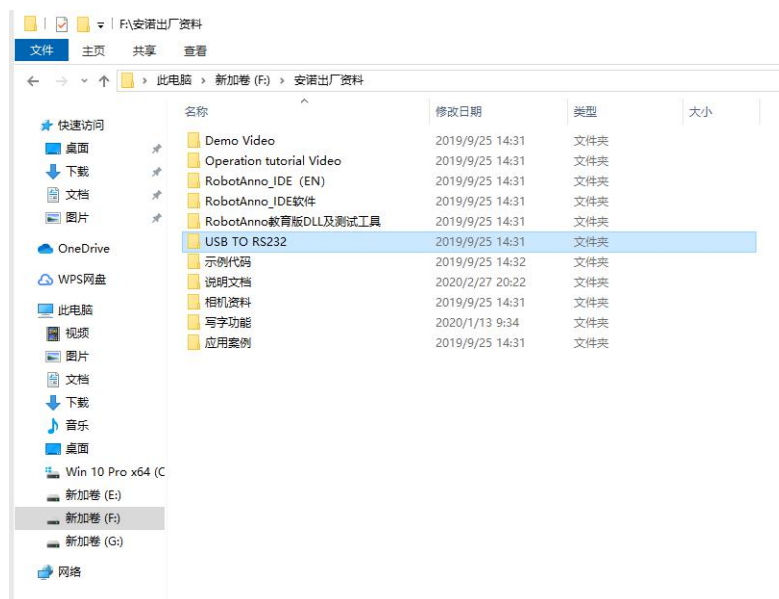
1. cable connections

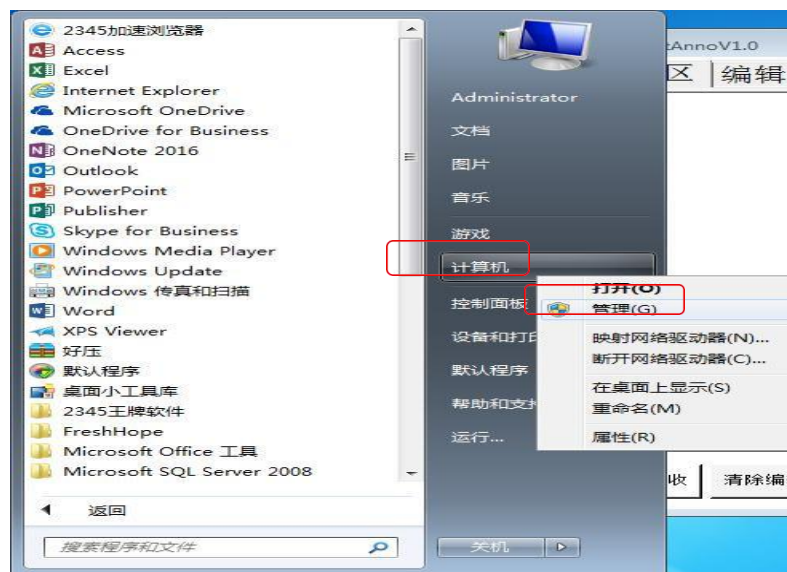
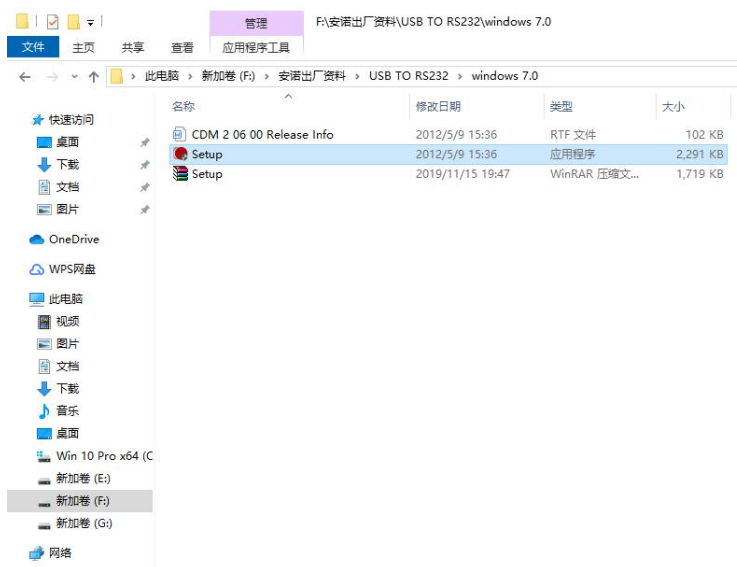
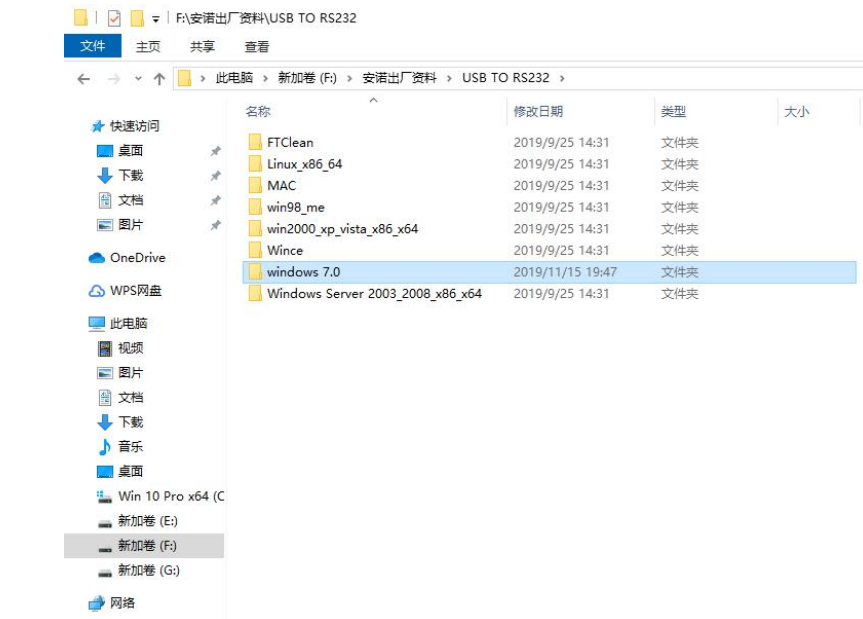
Connect the power cord and serial port.

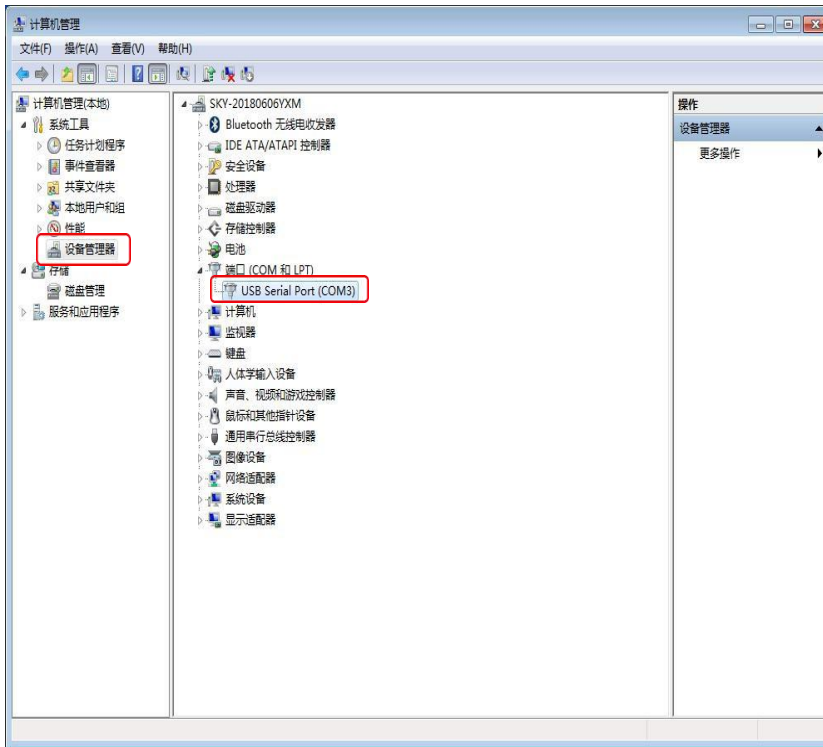


2. Download Driver

Open the file of Udisk of factory data package, open USB TO RS232 folder, according to the use of computer systems to selectively install, here take the Win7/Win7 system as an example, as shown in the figure:

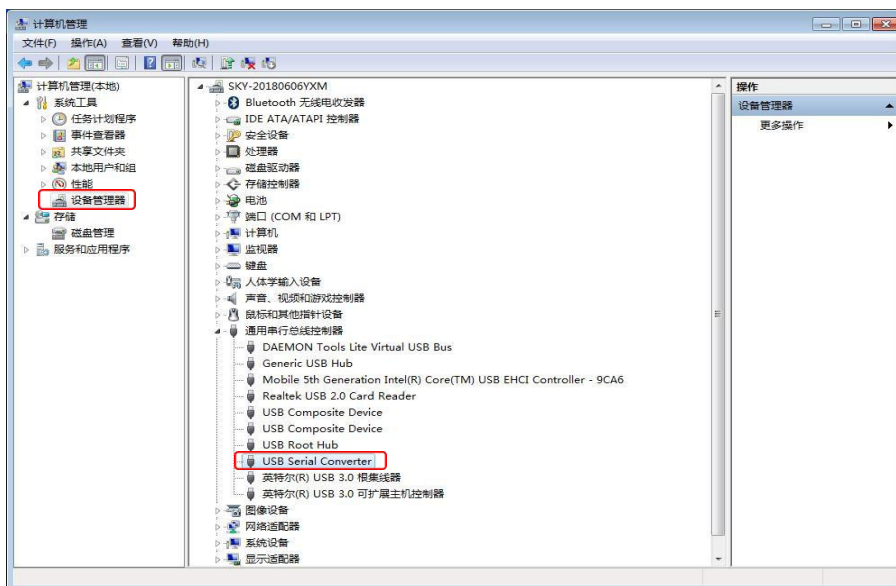






When the USB Serial Converter is seen in the universal serial bus controller, the USB TO RS232 driver installation is successful.

Select the port installed just now, the port number of each machine may be different, whichever is the actual port.



III. RobotannoV2.0 instructions

When the computer opens the robotanno2.0 software for the first time and the serial port is connected, a prompt window pops up to automatically create a folder in the root directory of the robotanno2.0's current software disk



Selection determination



Then select OK, and then restart the software.

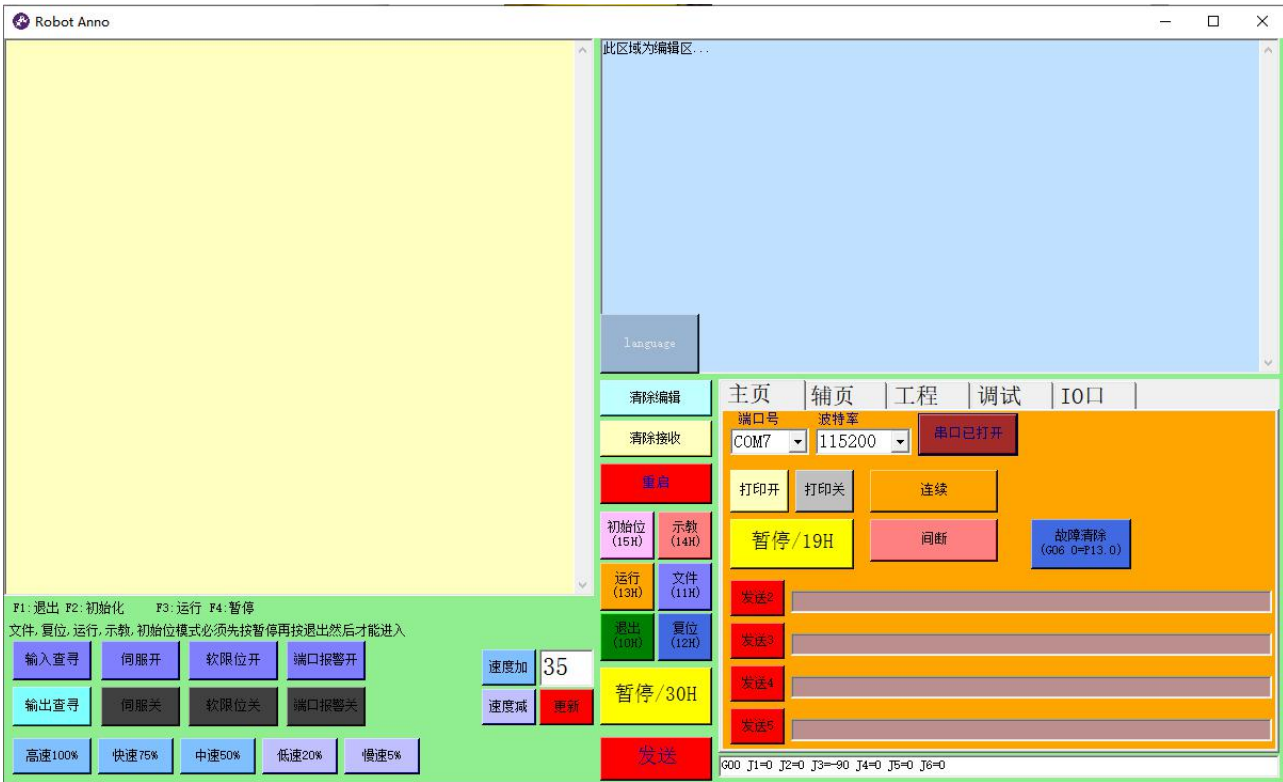


When the serial port is connected, the port number will be displayed automatically. If the serial port is not connected, the port number will appear blank

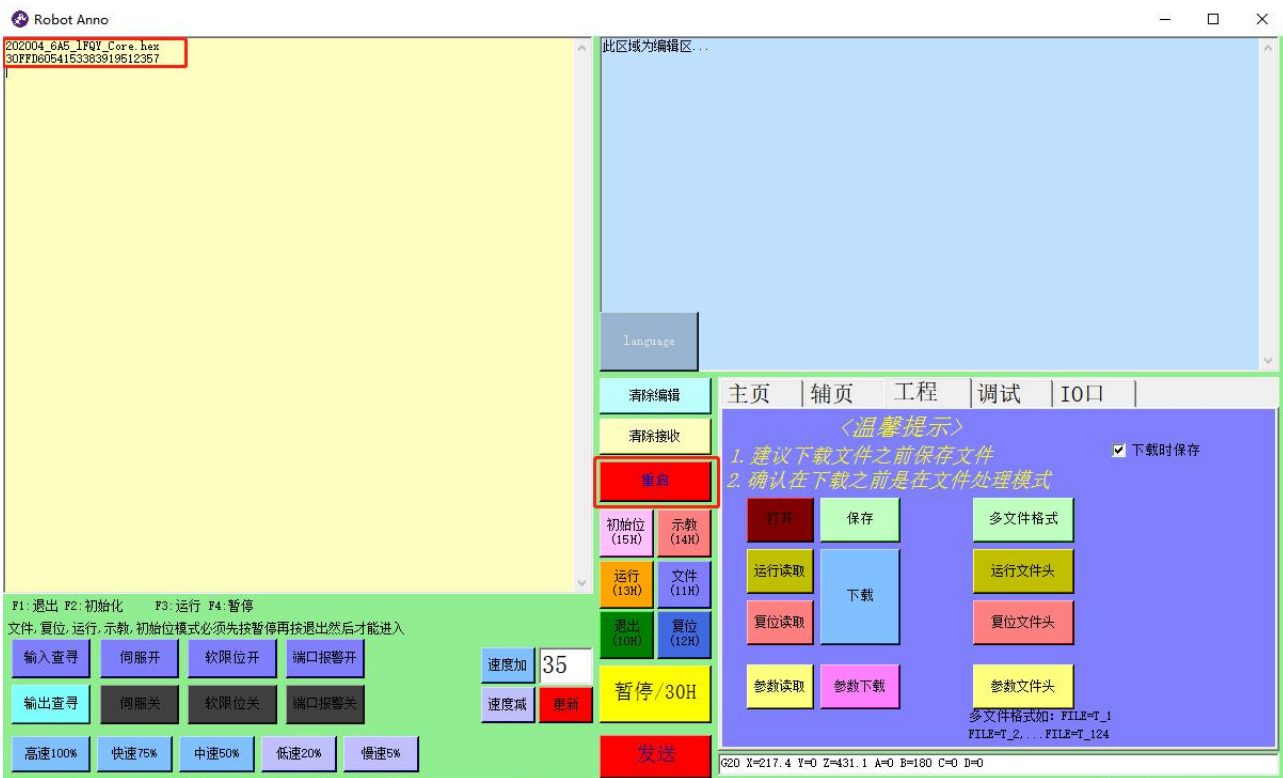
If the serial port is not connected, the serial port connection needs to be detected



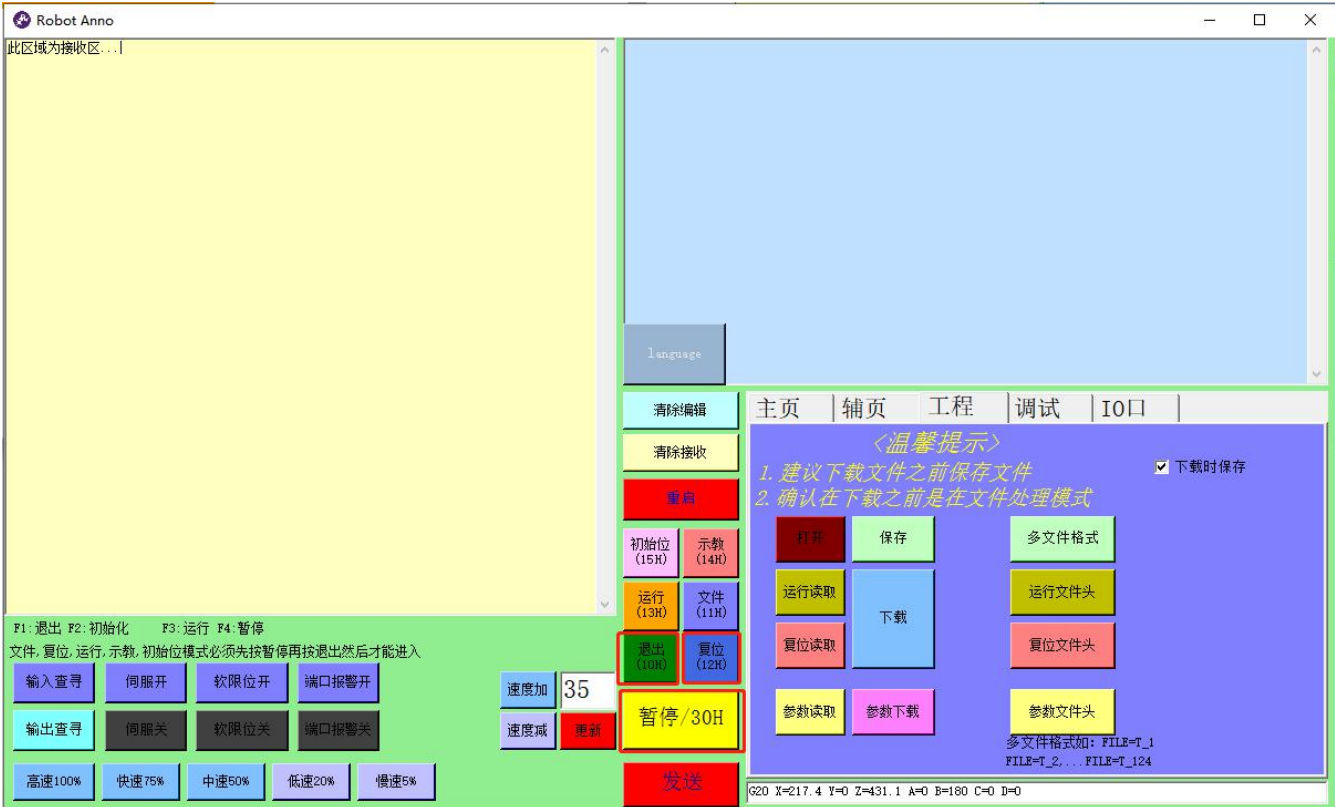
2 Open the software interface



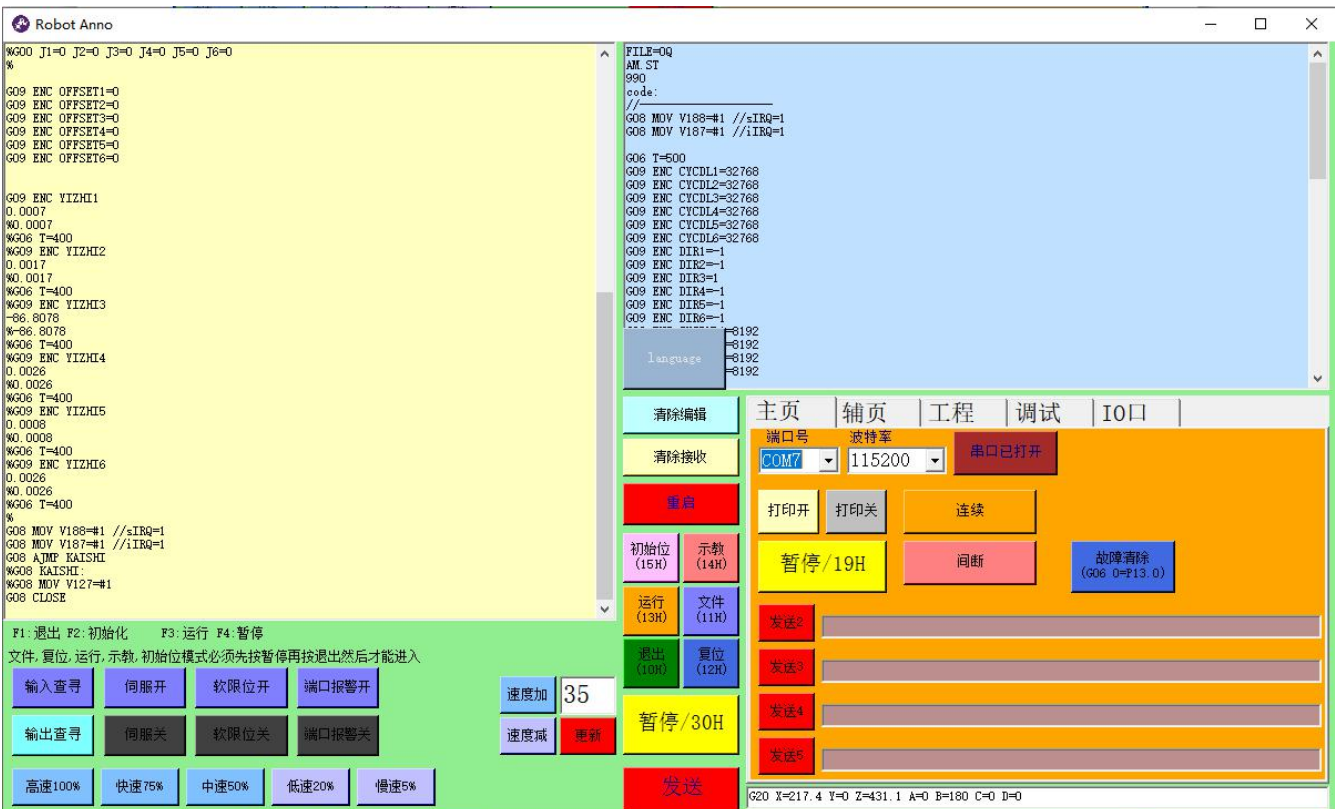
Click Restart, the beige receiving area will receive system version information



3 Enter reset mode, click pause, exit, reset



Step motor to find the origin sensor reset, before operation need controller parameter file, zero file configuration is correct

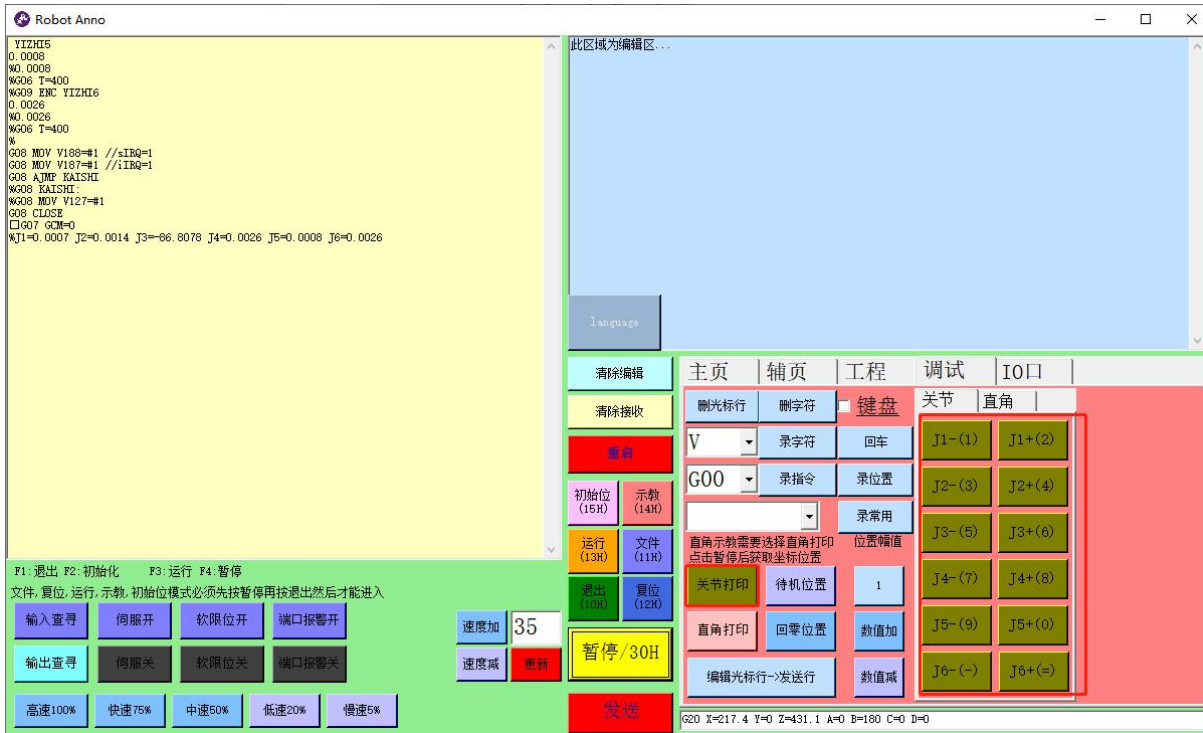


Servo motor read absolute encoder position, need controller parameter file before operation, return

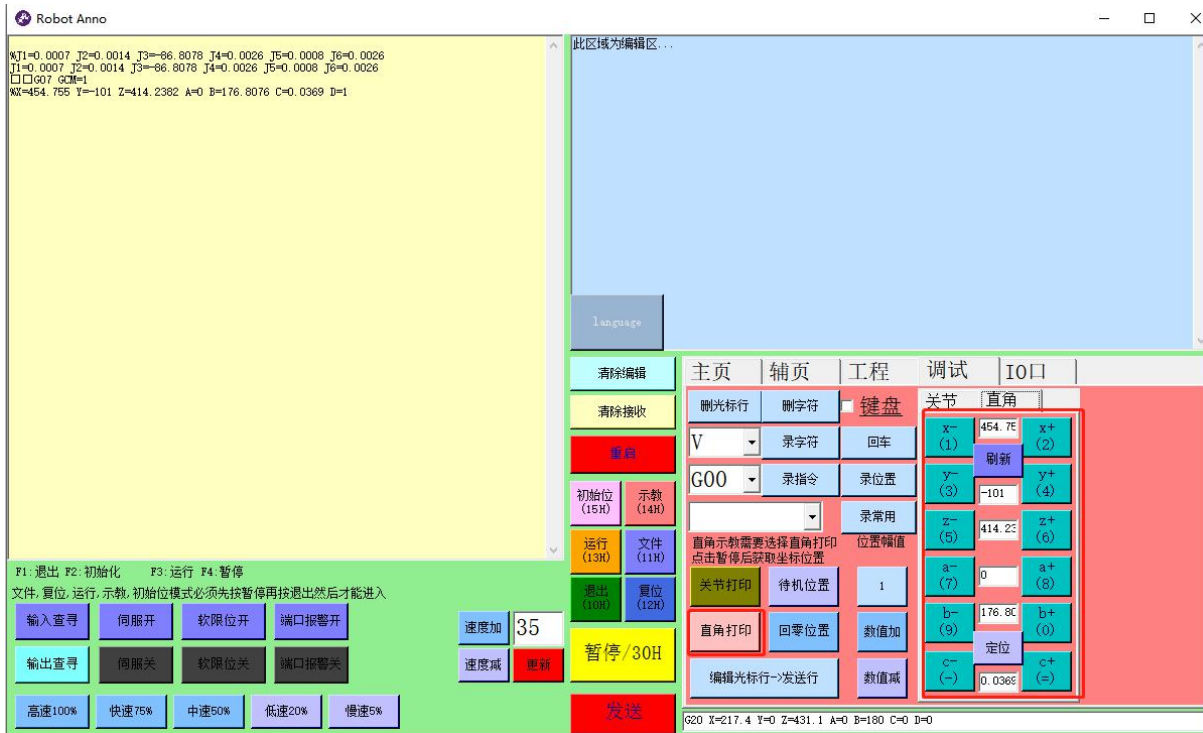
zero file configuration is correct

4 Enter Show mode, click pause (30 H), exit (10 H), show (14 H)

Click pause, The receiving area receives the robot's current position (joint position or rectangular coordinate position) when clicking on the joint print, Press pause, Print the joint angle, Operable Joint Debug Control (J1+), J1-, J2+, J2-, J3+, J3-, J4+, J4-, J5+, J5-, J6+, J6-, Control brackets are selected keyboard tick corresponding to the keyboard 1234567890=;

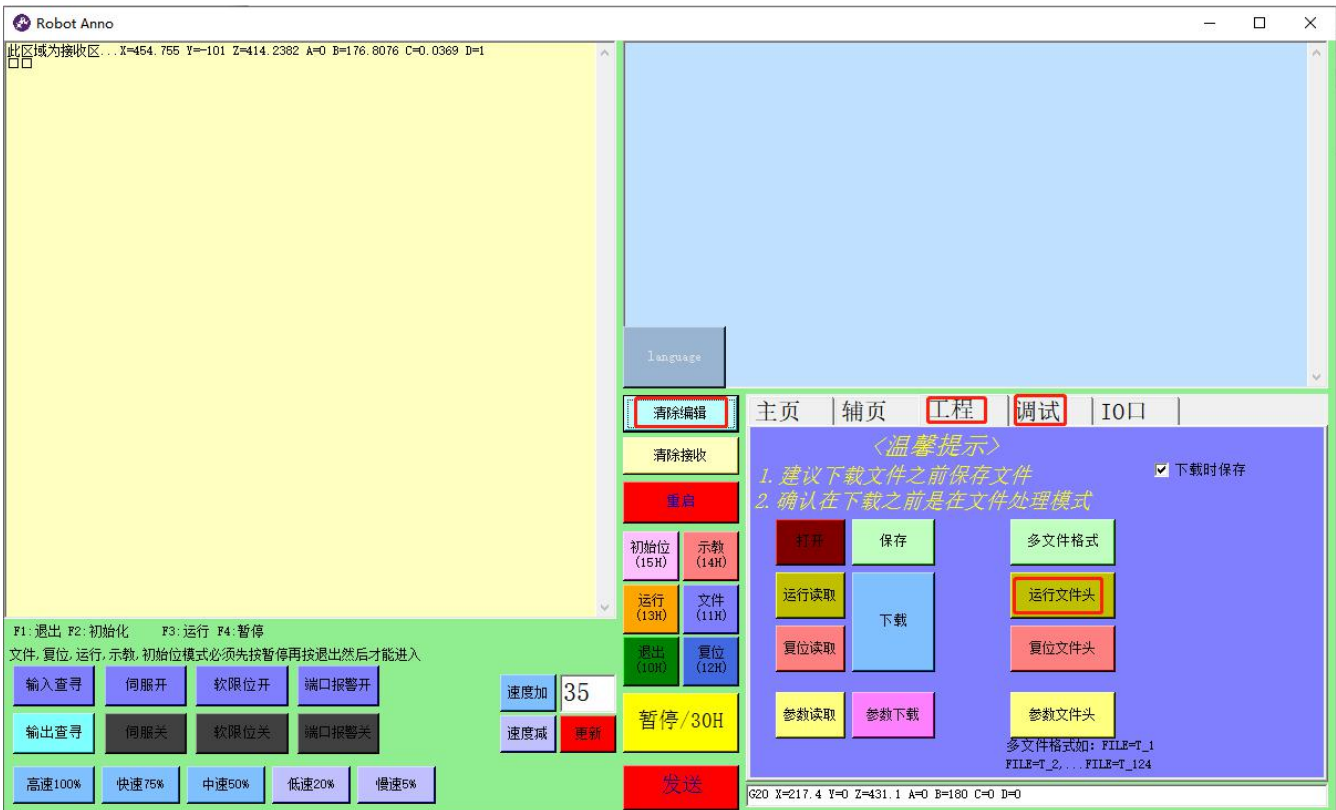


When you click on the right angle print, Press refresh, Then print the rectangular coordinate position attitude, Operable Joint Debug Control (x+), x-, y+, y-, z+, z-, a+, a-, b+, b-, c+, c-,) Control parenthesis corresponds to the keypad tick

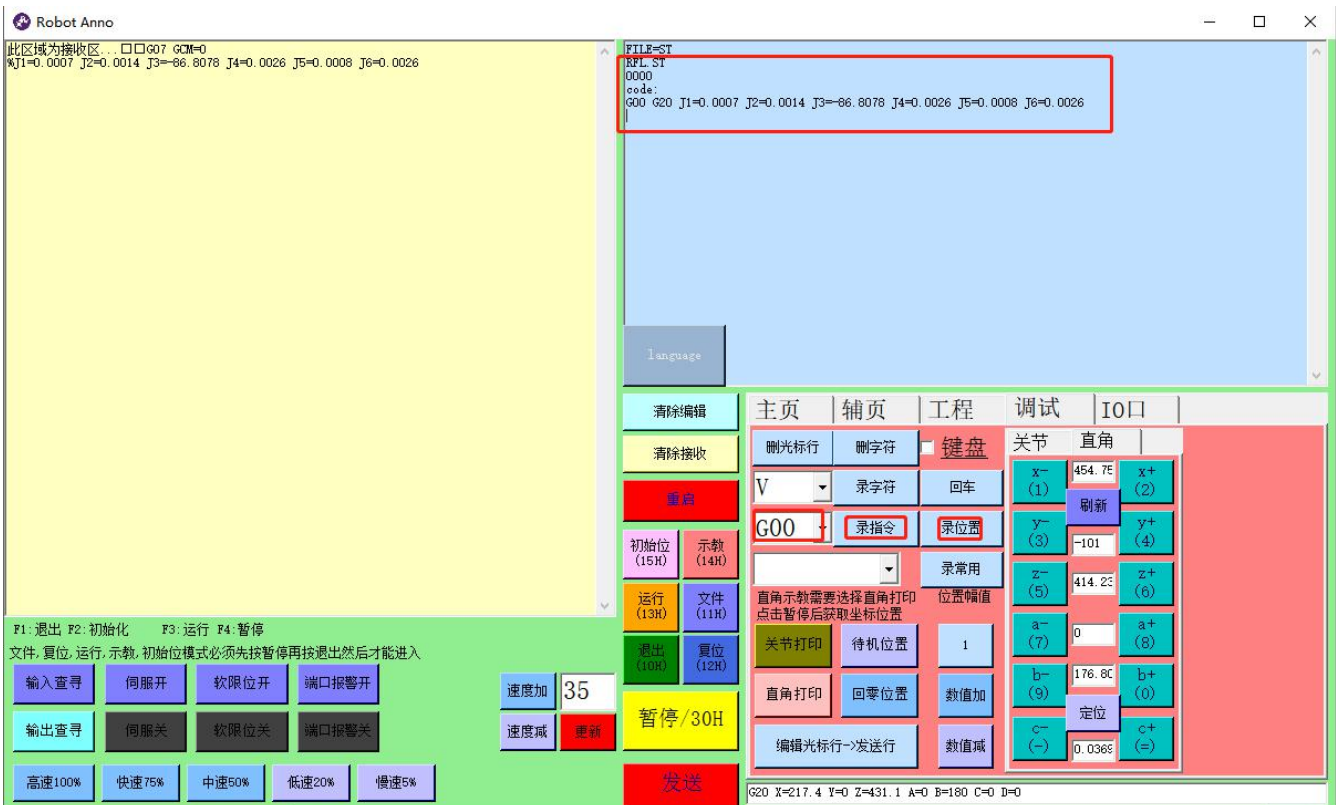


Programming, in teaching mode, click on the project, click clear edit, click on the running file header, and then click debug

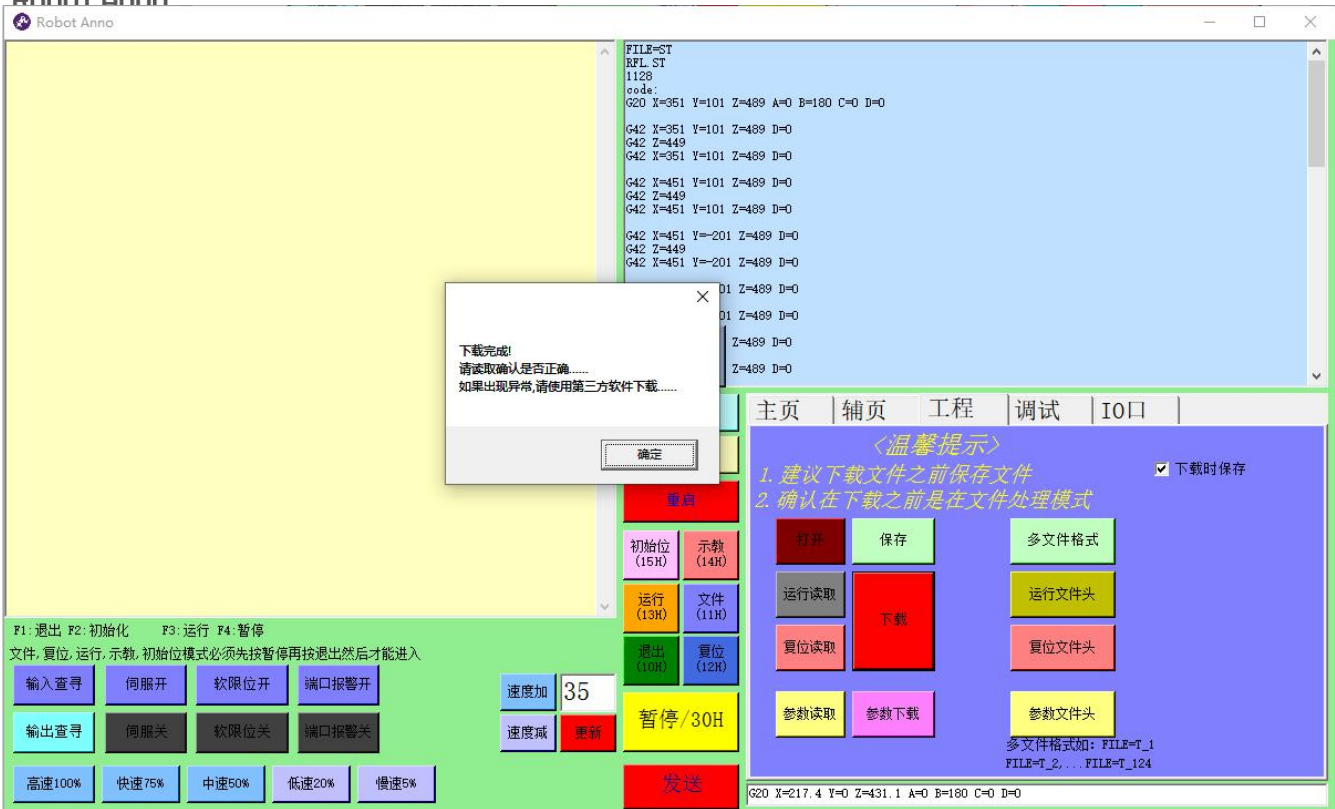
back to the debugging interface



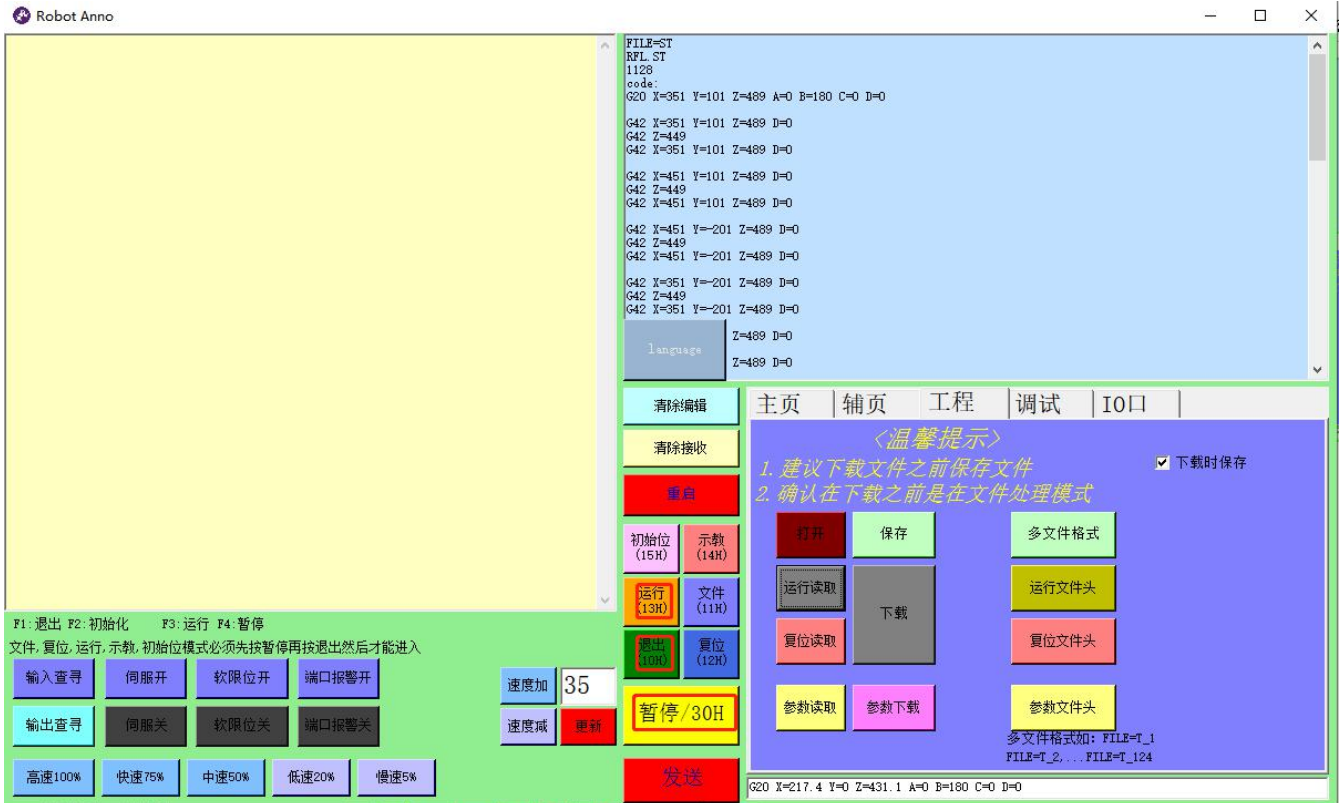
Click edit area cursor line, select command header, click record command, record location



File download, click pause, exit, file, download ;(download control need to enter the correct password, the initial password is 1101)



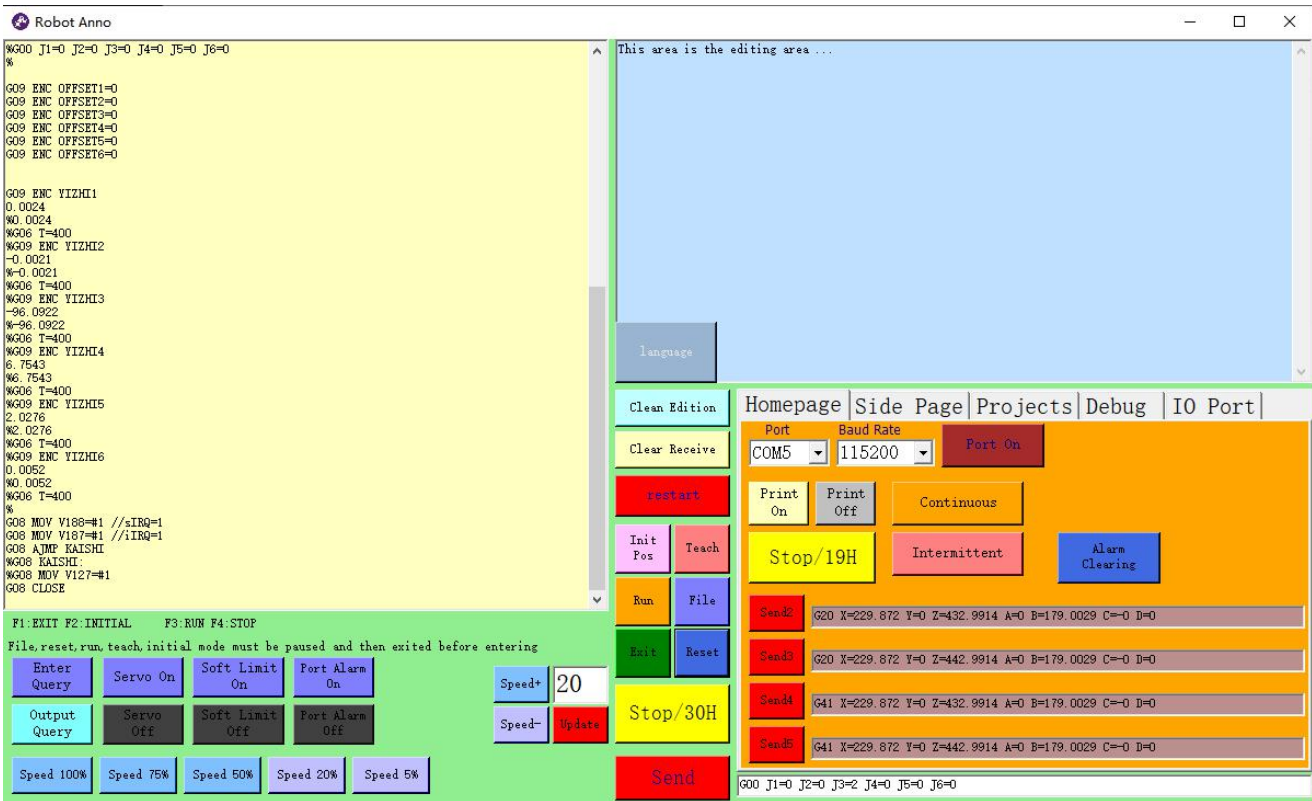
7 Run, click pause, exit, run



8.603 Multi-turn motor zero adjustment

1. manually adjust the arm to vertical zero position

2. power on reset (open host, connect serial port, then motor pause, exit and reset)



Robot Anno

```

G00 J1=0 J2=0 J3=0 J4=0 J5=0 J6=0
%
G09 ENC OFFSET1=0
G09 ENC OFFSET2=0
G09 ENC OFFSET3=0
G09 ENC OFFSET4=0
G09 ENC OFFSET5=0
G09 ENC OFFSET6=0

G09 ENC YIZHI1
0.0024
%0.0024
%G06 T=400
%G09 ENC YIZHI2
-0.0021
%-0.0021
%G06 T=400
%G09 ENC YIZHI3
-96.0922
%-96.0922
%G06 T=400
%G09 ENC YIZHI4
6.7543
%6.7543
%G06 T=400
%G09 ENC YIZHI5
2.0276
%2.0276
%G06 T=400
%G09 ENC YIZHI6
0.0052
%0.0052
%G06 T=400
%
G08 MOV V188=#1 //sIRQ=1
G08 MOV V187=#1 //iIRQ=1
G08 AMP RAISHI
%G08 RAISHI
%G08 MOV V127=#1
G08 CLOSE

```

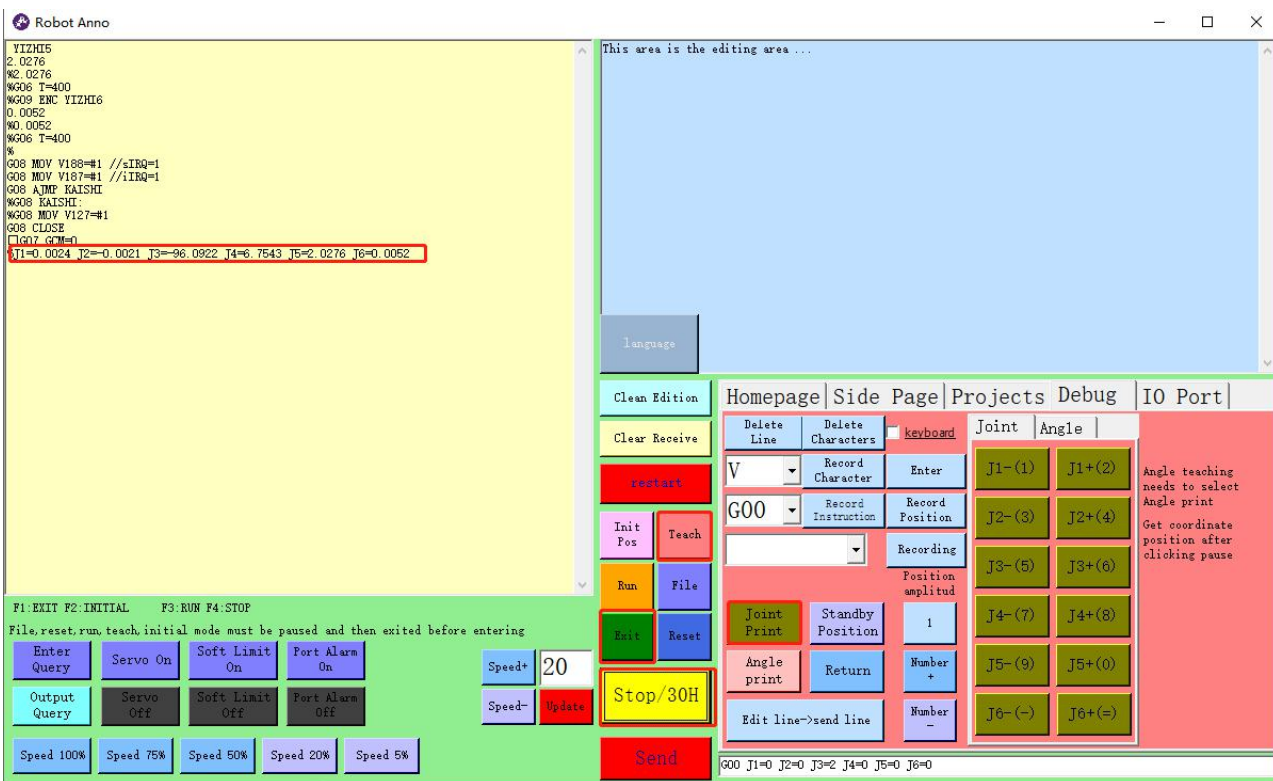
F1:EXIT F2:INITIAL F3:RUN F4:STOP
File,reset,run,teach,initial mode must be paused and then exited before entering

Speed 20
Speed- Update
Speed 100% Speed 75% Speed 50% Speed 20% Speed 5%

Send

G00 J1=0 J2=0 J3=0 J4=0 J5=0 J6=0

3. read joint position (click, pause, exit, teach, joint print, pause) in turn.)



Robot Anno

```

YIZHI5
2.0276
%2.0276
%G06 T=400
%G09 ENC YIZHI6
0.0052
%0.0052
%G06 T=400
%
G08 MOV V188=#1 //sIRQ=1
G08 MOV V187=#1 //iIRQ=1
G08 AMP RAISHI
%G08 RAISHI
%G08 MOV V127=#1
G08 CLOSE
G1=0.0024 J2=-0.0021 J3=-96.0922 J4=6.7543 J5=2.0276 J6=0.0052

```

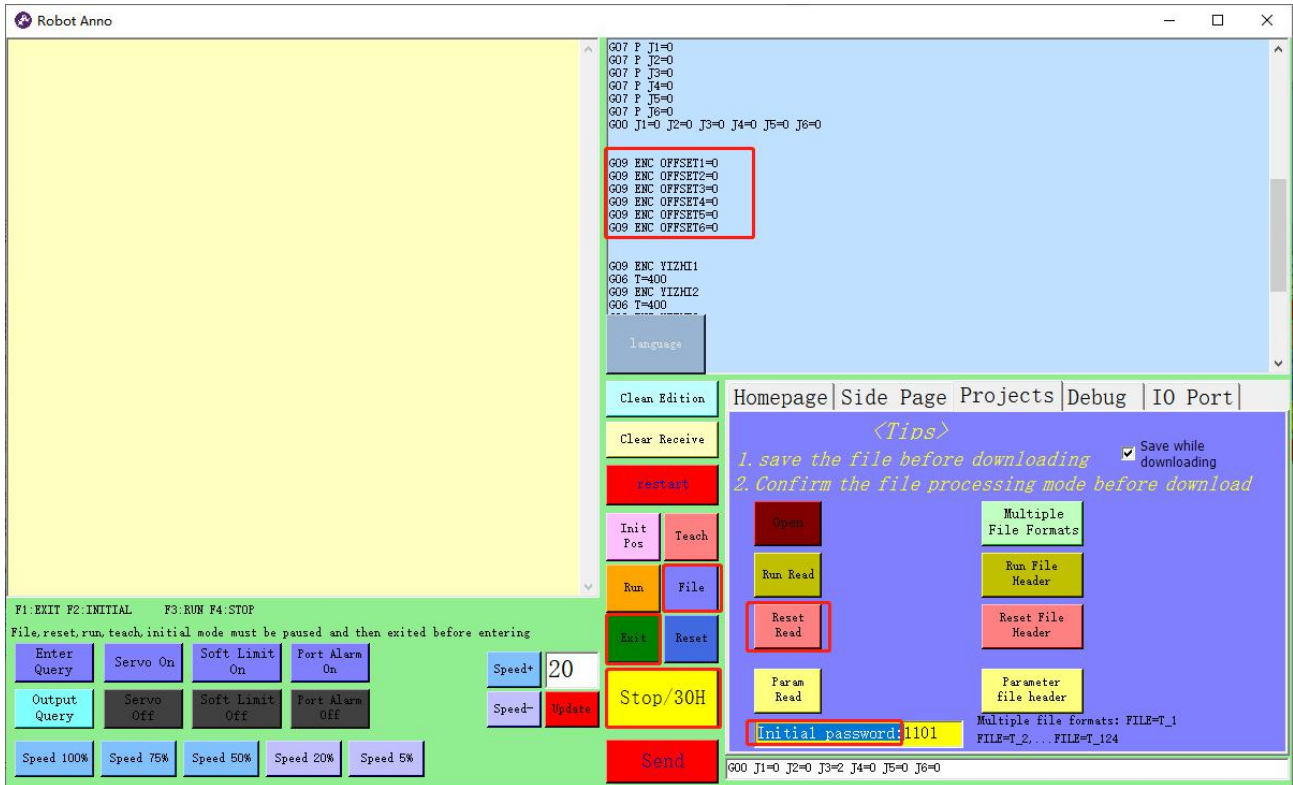
F1:EXIT F2:INITIAL F3:RUN F4:STOP
File,reset,run,teach,initial mode must be paused and then exited before entering

Speed 20
Speed- Update
Speed 100% Speed 75% Speed 50% Speed 20% Speed 5%

Send

G00 J1=0 J2=0 J3=0 J4=0 J5=0 J6=0

4. reset read (click pause, exit, file, reset read in



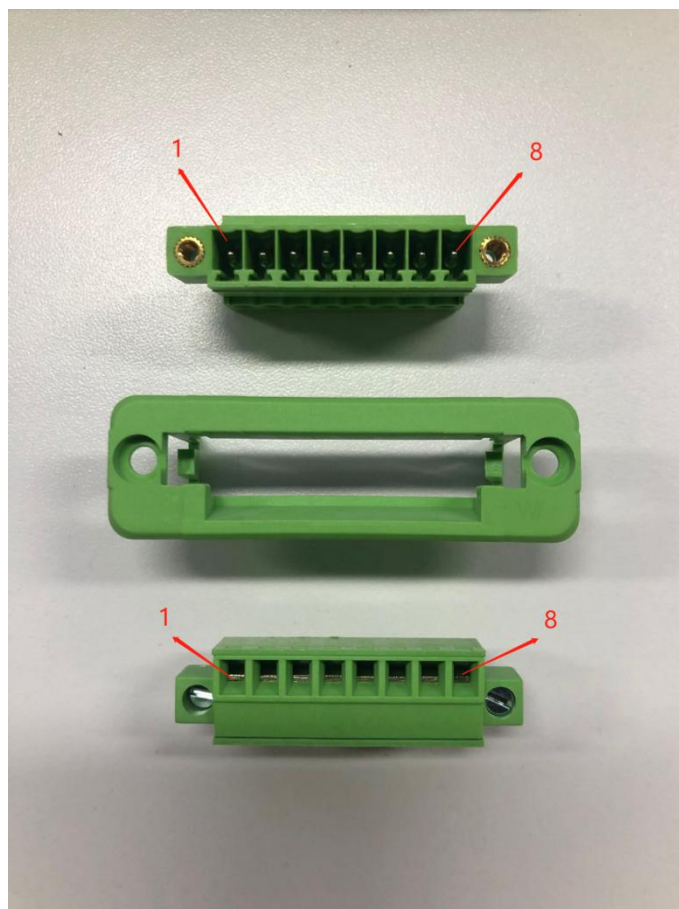
turn)

The value of joint printing J1=0.0024 J2J1=-0.0021 J3J1=-96.0922 J4J1=6.7543 J5J1=2.0276 0.0052 compensation reset file

```
G09ENC OFFSET1=-0.0024
G09ENC OFFSET2=0.0021
G09ENC OFFSET3=96.0922
G09ENC OFFSET4=-67543
G09ENC OFFSET5=-2.0276
G09ENC OFFSET6=-0.0052
```

5. delete "initial password :" keep 1101, then download reset file.

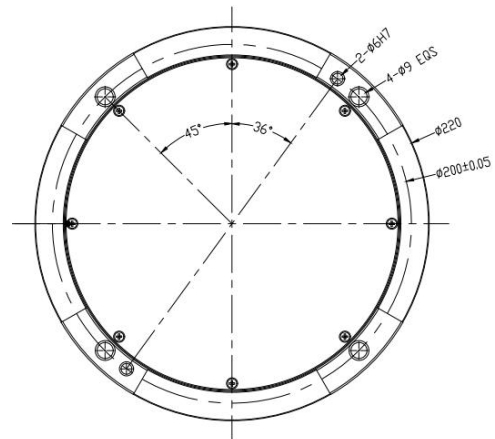
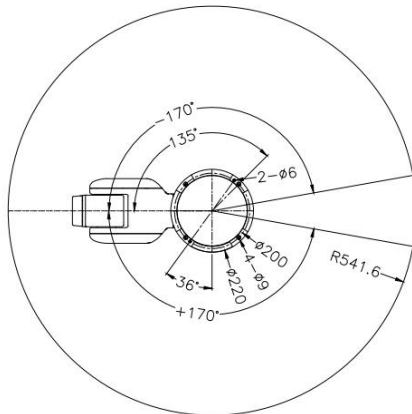
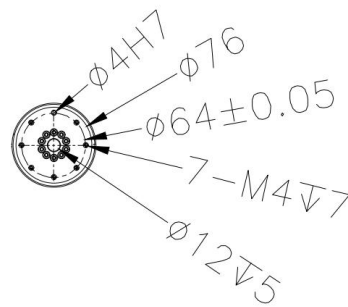
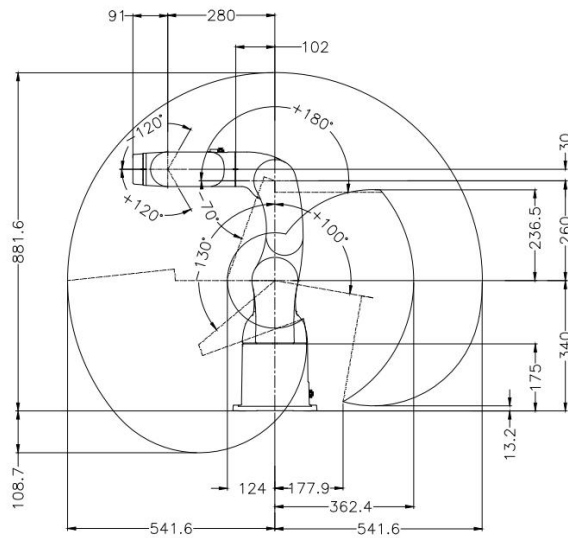
V. Interface definitions



603_ DB8 interface definition		
pin number	Definition	Remarks
1	STA(started)	
2	STO(discontinued)	
3	GND	
4	Output00	
5	Output01	
6	Output02	
7		
8		

VI. 603 parameters

1. Scope of work and installation dimensions



2. Controller parameters

Parameter file

```

FILE=INI
Parameter.ini
515
////DH_PARAMETER:
_h0=328;
_d1=0.1;
_h2=260;
_d3=30 per cent;
_h4=280
_h5=65;
_d6=16;
////MOTOR_DIR:
_dir1=1;
_dir2=1;
_dir3=1;
_dir4=1;
_dir5=1;
_dir6=1;
////JOINT_PUL:
_j1pul=668467.2;
_j2pul=827392;
_j3pul=663552;
_j4pul=668467.2;
_j5pul=417792;
_j6pul=409600;
////VELOCITY:
_ac=150000.0;
_de=150000.0;
_vpp=150000.0;
_vp=10;
////MODE:

```

Reset file

```

FILE=OQ
AM.ST
989
code:
//-----
G08MOV V188=# // sIRQ=1
G08MOV V187=# // iIRQ=1
G06T=500
G09ENC CYCDL1=32768
G09ENC CYCDL2=32768
G09ENC CYCDL3=32768
G09ENC CYCDL4=32768
G09ENC CYCDL5=32768
G09ENC CYCDL6=32768
G09ENC DIR1=-1
G09ENC DIR2=1
G09ENC DIR3=1
G09ENC DIR4=-1
G09ENC DIR5=1
G09ENC DIR6=1
G09ENC CYCPUL1=8192
G09ENC CYCPUL2=8192
G09ENC CYCPUL3=8192
G09ENC CYCPUL4=8192
G09ENC CYCPUL5=8192
G09ENC CYCPUL6=8192
G07P J1=0
G07P J2=0
G07P J3=0
G07P J4=0
G07P J5=0

```

```

G06T=200
G09ENC YIZHI4
G06T=200
G09ENC YIZHI5
G06T=200
G09ENC YIZHI6
G06T=200

G08MOV V188=# // sIRQ=1
G08MOV V187=# // iIRQ=1
G08AJMP KAISHI
//-----

```

VII. Case cases

Suction cup handling cases:

FILE=ST // file type

AM.ST // file name

771/byte

code:

// Operational

instructions

G07VP=50/speed

G20X=300 YG20X=131 ZG20X=55 AG20X=0 BG20X=180 CG20X=0 DG20X=0

G06O=P0.1// open the suction

G20X=300 YG20X=131 ZG20X=47.5 AG20X=0 BG20X=180 CG20X=0 DG20X=0

G20X=300 YG20X=131 ZG20X=60 AG20X=0 BG20X=180 CG20X=0 DG20X=0

G20X=300 YG20X=42.5 ZG20X=60 AG20X=0 BG20X=180 CG20X=0 DG20X=0

G20X=300 YG20X=42.5 ZG20X=20 AG20X=0 BG20X=180 CG20X=0 DG20X=0

G06O=P0.0// shut off suction

G06T=1000/ wait a second

G20X=300 YG20X=42.5 ZG20X=47 AG20X=0 BG20X=180 CG20X=0 DG20X=0

G20X=300 YG20X=131 ZG20X=47 AG20X=0 BG20X=180 CG20X=0 DG20X=0

G06O=P0.1

G20X=300 YG20X=131 ZG20X=38 AG20X=0 BG20X=180 CG20X=0 DG20X=0

G20X=300 YG20X=131 ZG20X=51 AG20X=0 BG20X=180 CG20X=0 DG20X=0

G20X=300 YG20X=-46 ZG20X=51 AG20X=0 BG20X=180 CG20X=0 DG20X=0

G20X=300 YG20X=-46 ZG20X=20 AG20X=0 BG20X=180 CG20X=0 DG20X=0

G06O=P0.0

G06T=1000

G20X=300 YG20X=-46 ZG20X=38 AG20X=0 BG20X=180 CG20X=0 DG20X=0

G20X=300 YG20X=131 ZG20X=38 AG20X=0 BG20X=180 CG20X=0 DG20X=0

G20X=300 YG20X=131 ZG20X=29 AG20X=0 BG20X=180 CG20X=0 DG20X=0

G06O=P0.1

G20X=300 YG20X=131 ZG20X=42 AG20X=0 BG20X=180 CG20X=0 DG20X=0

G20X=300 YG20X=134 ZG20X=42 AG20X=0 BG20X=180 CG20X=0 DG20X=0

G20X=298 YG20X=134 ZG20X=22 AG20X=0 BG20X=180 CG20X=0 DG20X=0

G06O=P0.0

G06T=1000

G20X=300 YG20X=134 ZG20X=42 AG20X=0 BG20X=180 CG20X=0 DG20X=0