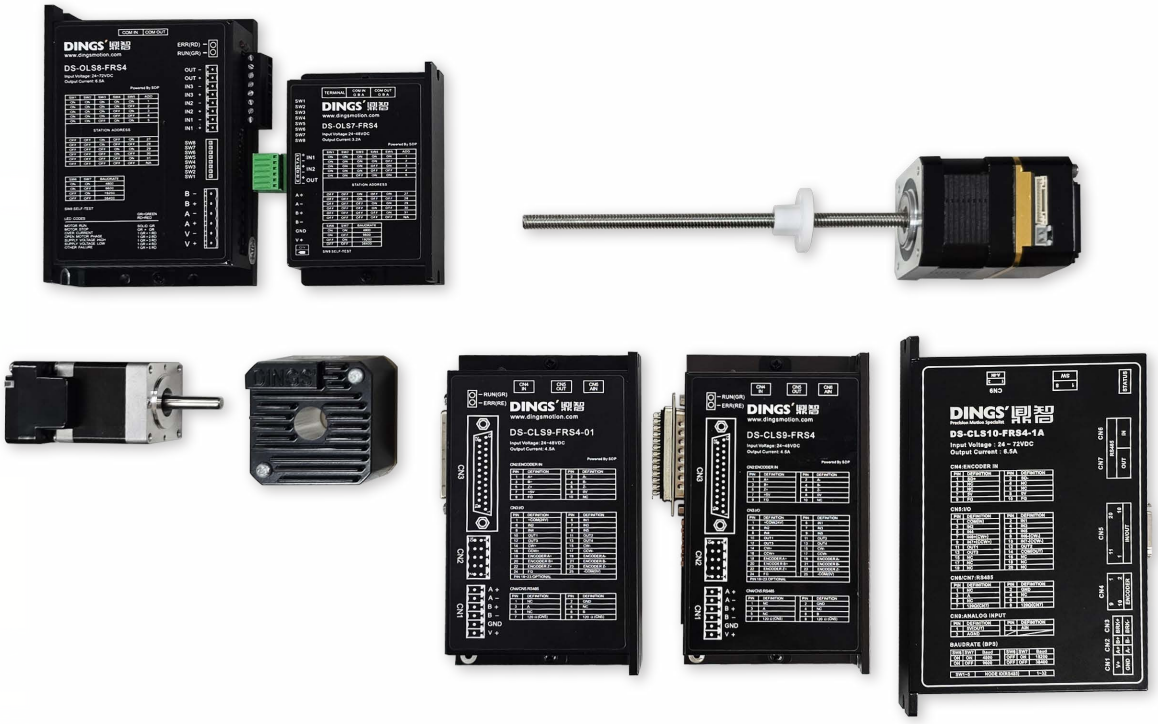
DINGS
Precision Motion Specialist

VER 1.0

DINGS' TUNER PRO

User Manual



DINGS
Precision Motion Specialist

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Warranty

- If a failure occurs within one year from the date of purchase due to reasons other than misuse or improper operation, the product may be returned to DINGS' via courier or freight service for free repair. Please note that repair service may require several working days.
- If a failure is caused by improper operation, misuse, or occurs after the one-year warranty period, repair service will be provided at the customer's expense. The product may be returned to DINGS' via courier or freight service. Since repairs may require several working days, customers using the product in critical applications are advised to keep spare units available.
- DINGS' shall not be responsible for any damage occurring during transportation when the product is returned for repair. Please ensure that sufficient cushioning materials are used and that the product is properly protected from excessive vibration during shipment (less than 0.5 G is recommended).
- The following services are not included in the product purchase price:

  A. System compatibility review and application evaluation during system design

  B. Trial operation, commissioning, and parameter adjustment (Motors adjusted or customized for a specific application may not be returned.)

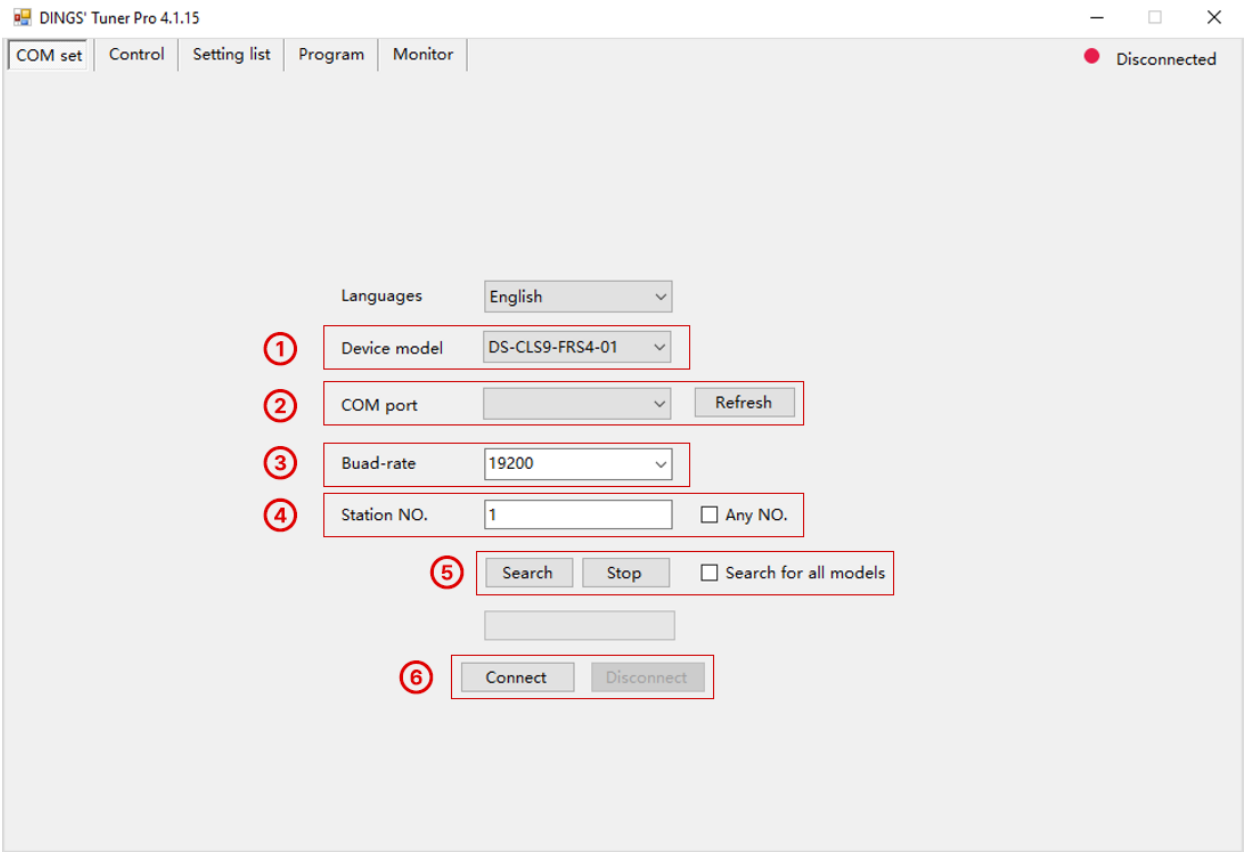
  C. On-site troubleshooting, fault diagnosis, and repair services

Safety Precautions

- Use this product only within the rated specifications and operating environment described in this manual.
- This product is not designed or manufactured for life-critical applications or environments. If the product is intended for special applications, please consult DINGS' sales representatives before use.
- Although DINGS' strives to provide products of the highest quality and reliability, users must implement appropriate safety measures, including redundant system design, fire protection measures, and malfunction prevention mechanisms, to prevent personal injury, fire, or other damage resulting from system failures.
- Product specifications may be changed without prior notice for performance improvement or product enhancement purposes.

1. Communication Settings

1.1 Interface Overview



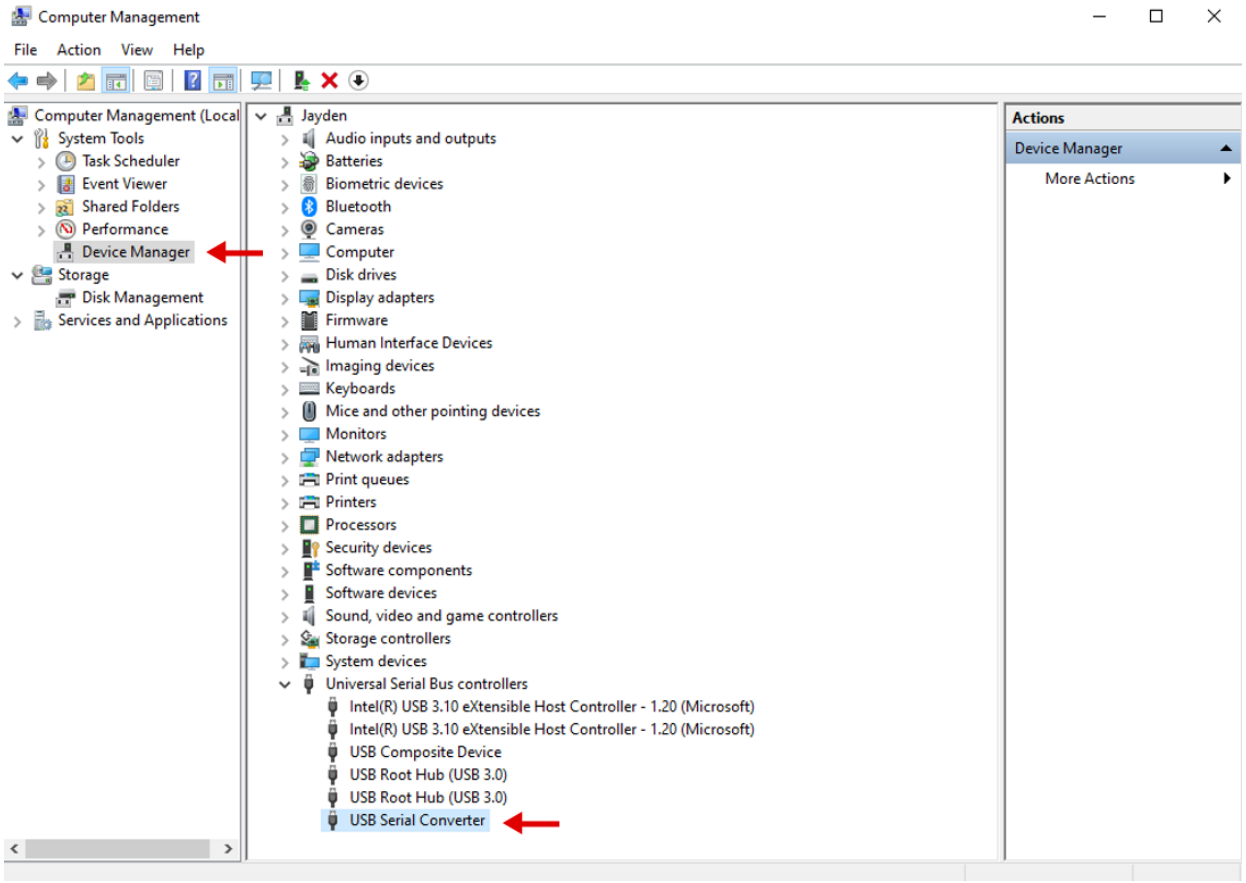
No	Function
1	Select the device model corresponding to the connected driver.
2	Select the communication port (COM port). A USB-to-serial driver must be installed when using a communication module.
3	Select the baud rate for communication. The default value is 19200 bps.
4	Select the station number. The default value is 1.
5	Search for the station number. If only one driver is connected and the station number is unknown, the search function can be used.
6	Connect to or disconnect from the device.

1.2 Connection Preparation

1.2.1 Driver Installation

Right-click This PC and select Manage to open the Computer Management window.

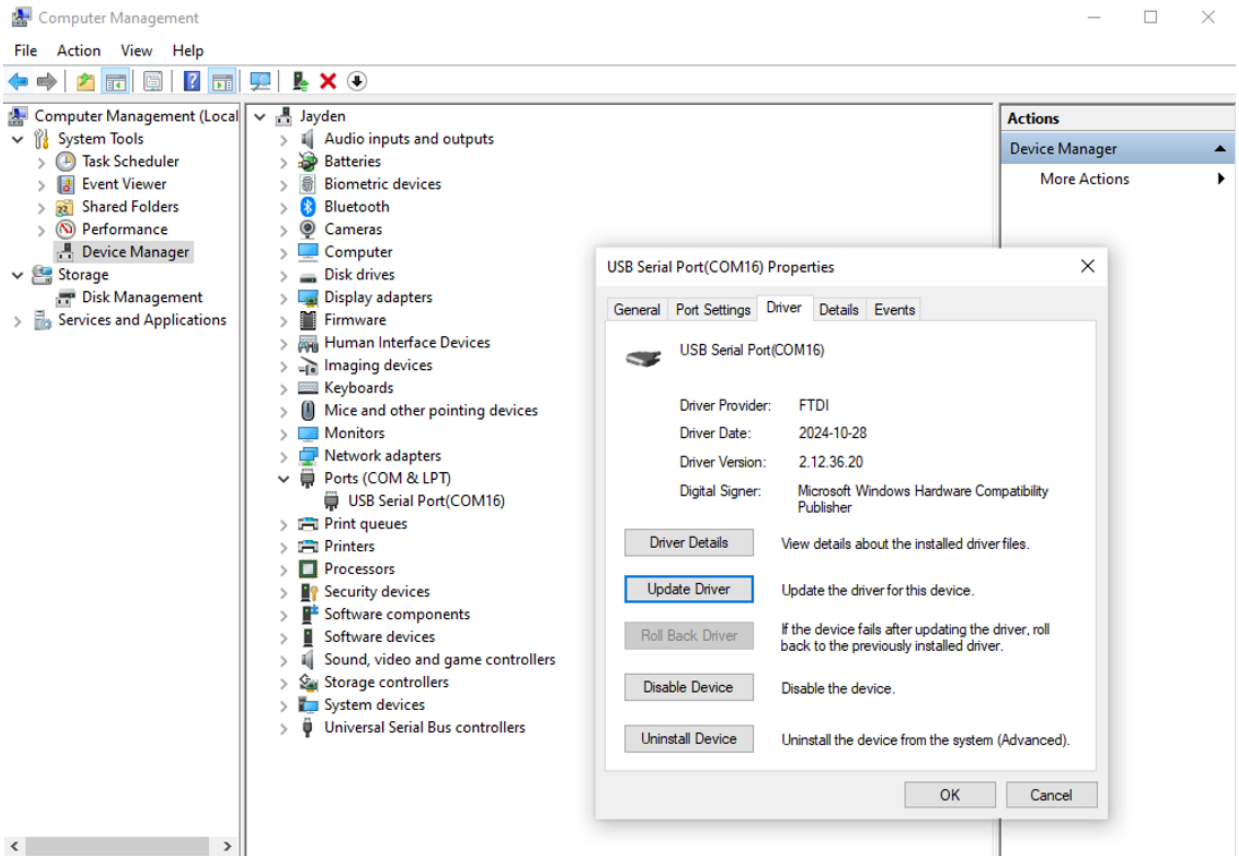
Then select Device Manager.



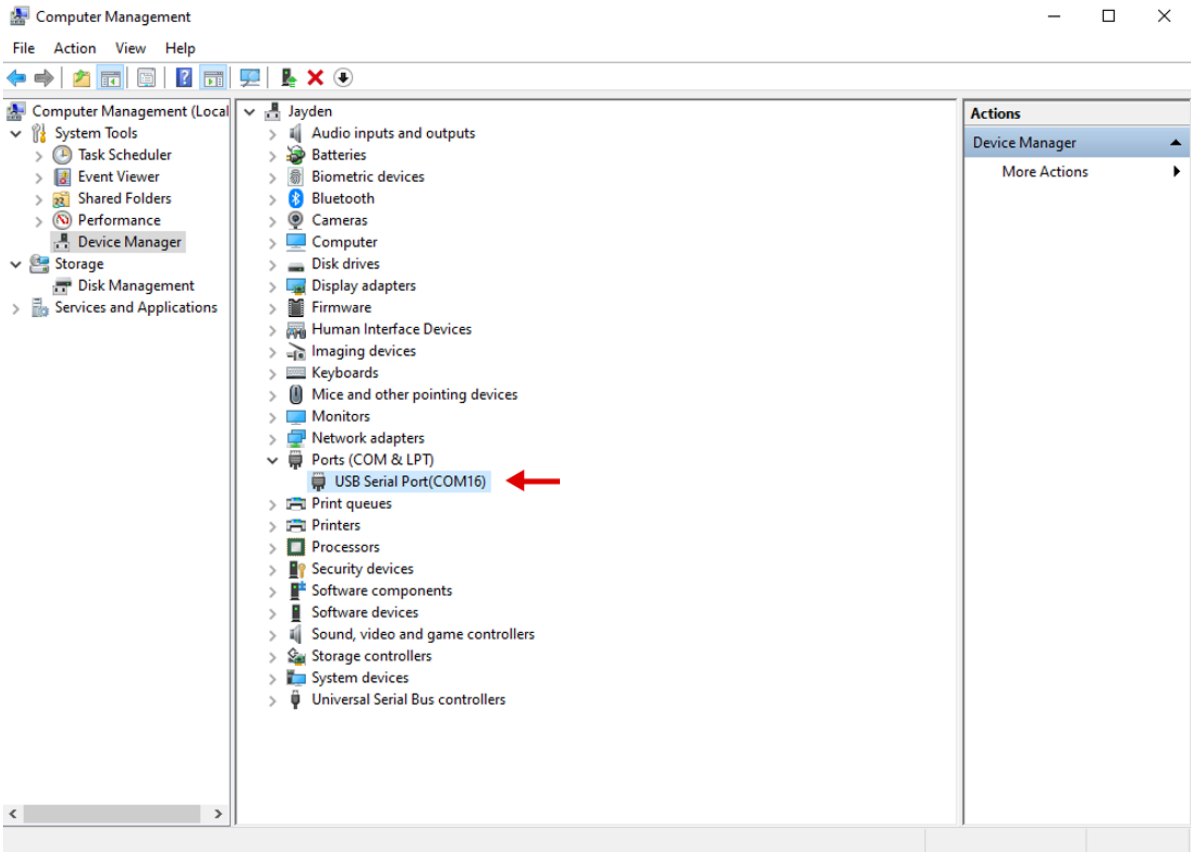
Under Other Devices, a device named USB Serial Port will appear, as shown in Figure ①.

Right-click the device and select Update Driver. Choose Browse my computer for drivers, click Browse, and select the driver folder. Click Next to start the installation.

Once the installation is complete, the driver will be installed successfully.



After successful installation, USB Serial Port will appear under Ports (COM & LPT) in Device Manager.



1.2.2 Connection Parameter Settings

Select the device model that matches the connected driver. Then select the COM port assigned to the connected device. If the communication module is connected after the software has already been launched, click Refresh to reload the available COM ports and select the correct port.

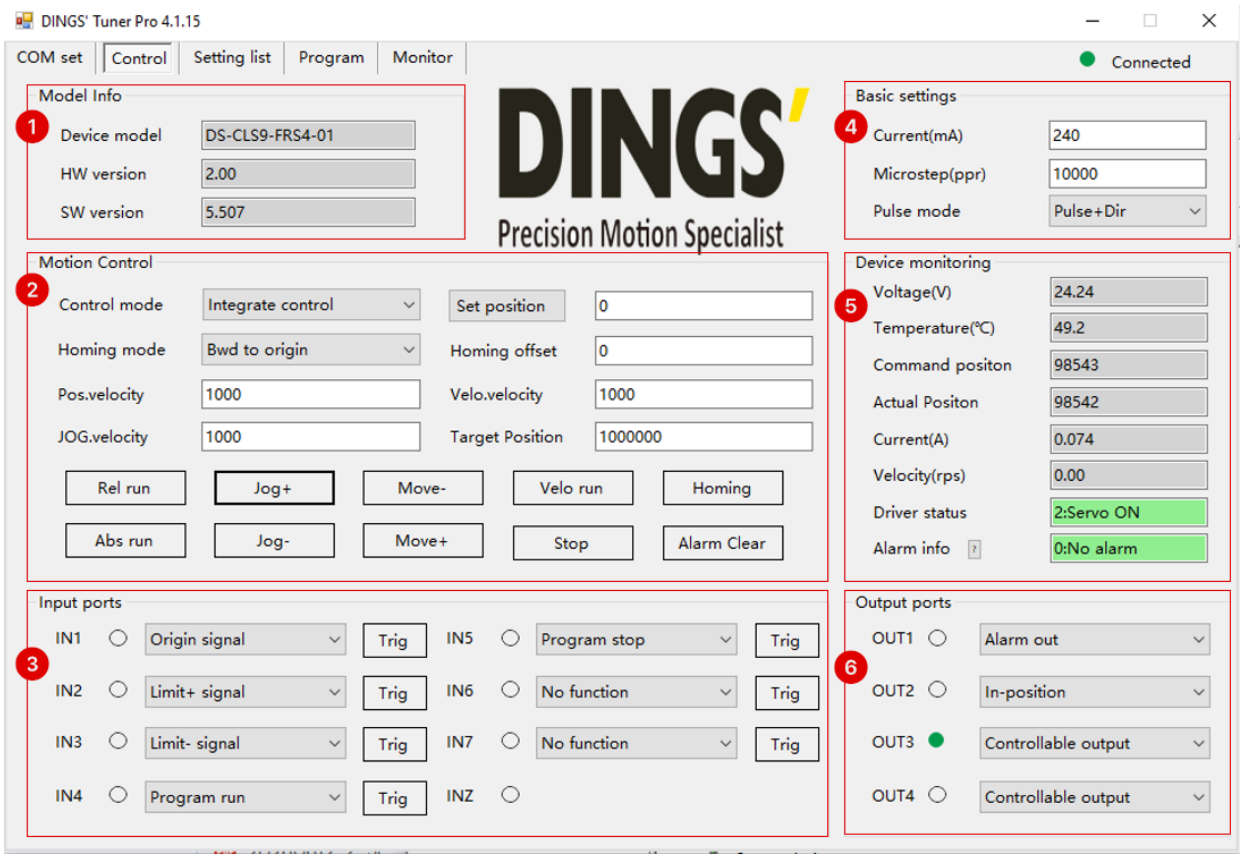
Next, select the communication baud rate. The default baud rate is 19200. Finally, set the station number. Unless it has been modified, the default station number is 1.

After all settings have been confirmed, click Connect. The software will then switch to the Device Monitoring interface.

2. Device Monitoring

2.1 Interface Overview

The Device Monitoring interface consists of six main sections: Product Information, Operating Parameters & Control, Input Port Configuration, Basic Settings, Device Status Monitoring, and Output Port Configuration.



No	Function
1	Displays basic driver information.
2	Configures motion parameters, performs basic motion control, and clears alarms.
3	Configures input ports and software trigger functions.
4	Configures microstepping resolution and operating current.
5	Displays the current device status.
6	Configures output ports.

2.2 Operation Guide

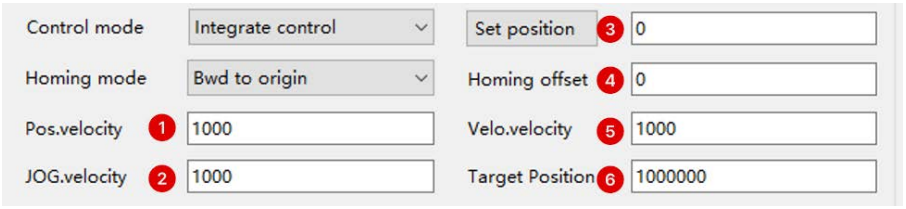
2.2.1 Model Info and Device Monitoring

These two sections are for monitoring purposes only. Product information is automatically loaded when the connection is established, while the Device Status Monitoring section continuously updates real-time operating data, including bus voltage, driver temperature, and other device status information.

2.2.2 Basic Settings and Motion Control

First, configure the operating current and microstepping resolution. The current setting should match the rated current of the connected motor. The microstepping resolution determines the number of pulses required for one motor revolution and, in most applications, only needs to be configured during the initial setup.

The following parameters and their functions are described below.



No	Applicable Buttons	Function
1	Pos.velocity	Sets the position mode speed in units of 0.01 rps. This setting is independent of the microstepping resolution.
2	JOG.velocity	Sets the jog mode speed.
3	Set Position	Replaces the current actual position with the value entered in the position field.
4	Homing Offset	Sets the home offset. After the homing operation is completed, the motor moves an additional number of pulses specified in the offset field.
5	Velo.velocity	Sets the speed for speed mode operation.
6	Target Position	Sets the number of pulses to be executed during operation.

The primary parameters to be configured are the motion speeds. All speed values are expressed in units of 0.01 rps (revolutions per second) and are independent of the microstepping resolution. No additional conversion is required.

The actual operating position is determined by comparing the Command Position and Actual Position values. For motors without an encoder, the Actual Position cannot be displayed and will always be displayed as 0. For motors equipped with an encoder, the Actual Position will be displayed in real time.

All control buttons modify the Command Position. In closed-loop mode, the Command Position remains synchronized with the Actual Position. In open-loop mode, position deviation may occur. After power-up, the default Command Position is 0, which is also the default home position.

The relationship between the Command Position and microstepping resolution is as follows: the configured microstep value defines the number of pulses required for one motor revolution. For example, if the microstepping resolution is set to 1000, a Command Position of 1000 corresponds to one revolution in the forward direction, while a Command Position of -1000 corresponds to one revolution in the reverse direction.

The software also supports an internal pulse control mode, which allows the motor to be controlled directly through the driver. In this mode, motor operation can be performed using the ten control buttons available in the software interface. The functions of these buttons are described below.

No	Reference Parameters	Action
1	Rel run	Relative position : Increases the Command Position by the Run Pulse Count. A negative value results in reverse rotation.
2	Abs run	Absolute position : Sets the Command Position to the Run Pulse Count value and moves the motor to that position.
3	Jog+	Rotates the motor forward while the button is pressed.
4	Jog-	Rotates the motor in reverse while the button is pressed
5	Move-	Moves the motor in forward by the Run Pulse Count. A negative value results in forward rotation.
6	Move+	Moves the motor in reverse by the Run Pulse Count. A negative value results in forward rotation.
7	Velo run	Runs the motor at the configured speed.
8	Stop	Stops the motor during operation.
9	Homing	Starts the homing operation.
10	Alarm clear	Clears the active alarm.

Refer to Figure 2.1 (Forward Homing) and Figure 2.2 (Reverse Homing) for the homing sequence.

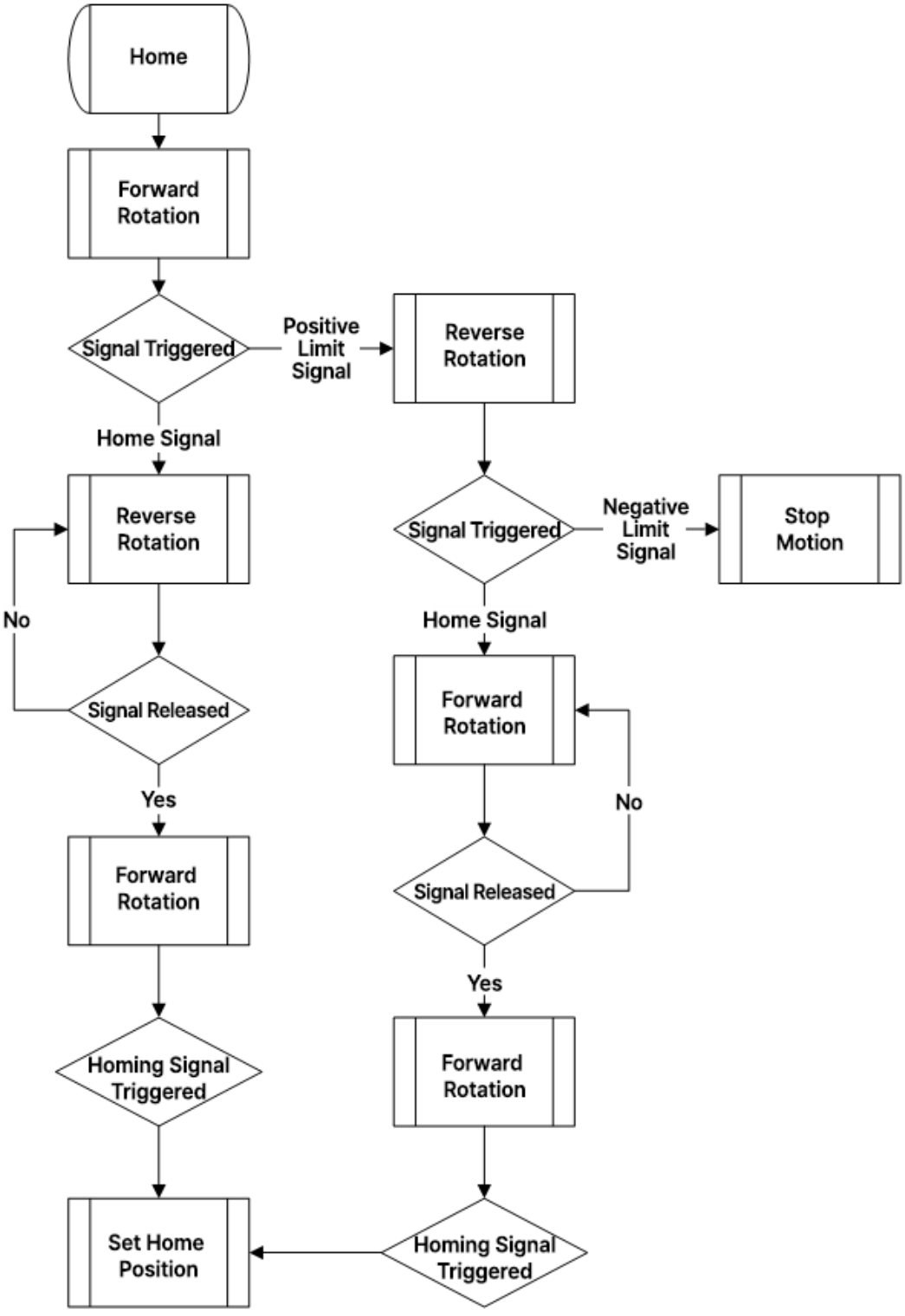


Figure 2.1 Forward Homing

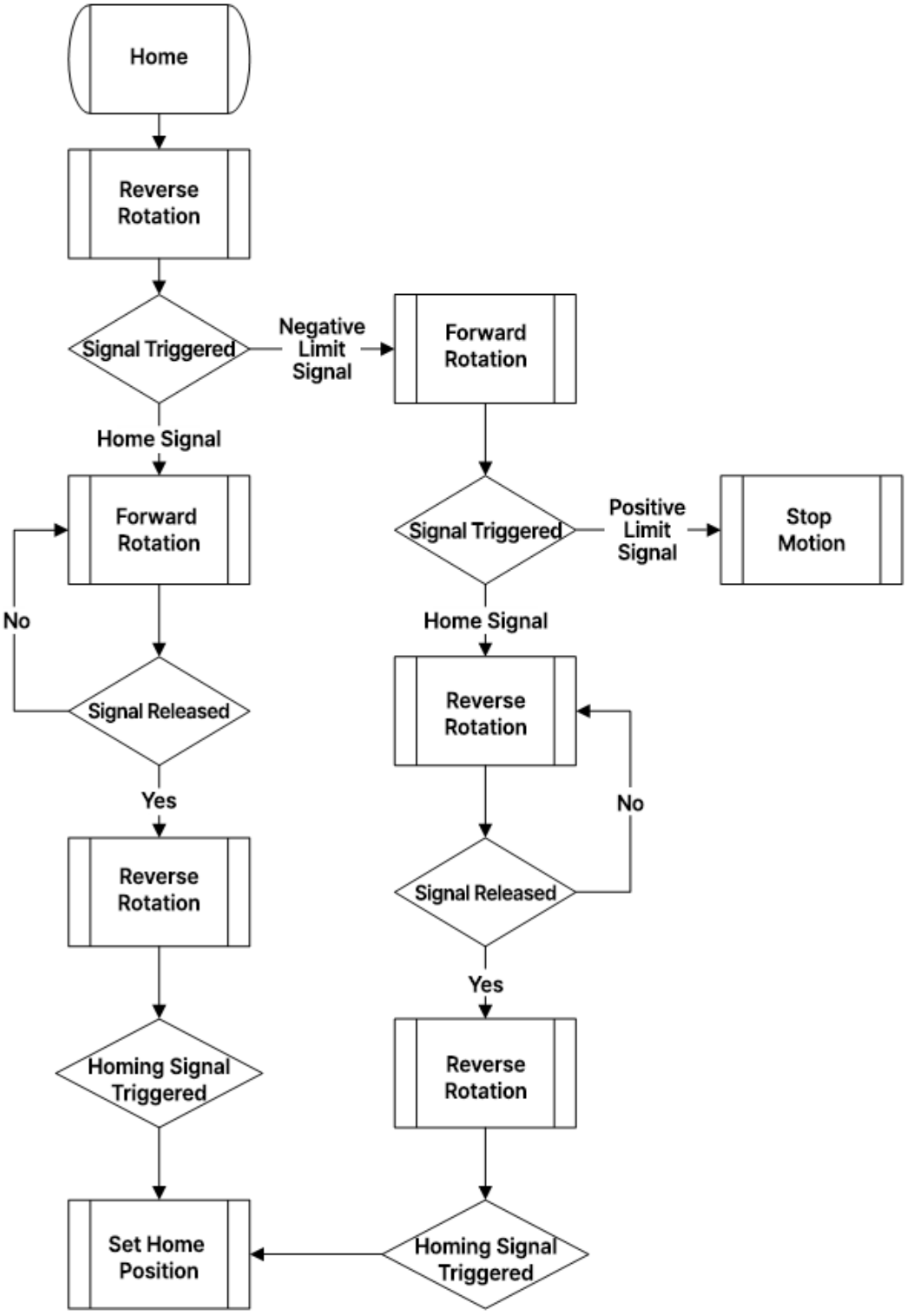


Figure 2.2 Reverse Homing

2.2.3 Input Port Configuration and Output Port Configuration

The Input Port Configuration function allows simple control operations to be triggered through external input signals. Functions with the same names as the control buttons described in the previous section are not repeated here. This section focuses on functions that have not yet been introduced.

Input Port Configuration

Function No.	Function
0	No function
1	Absolute position run, invalid in pulse control mode
2	Relative position run, invalid in pulse control mode
3	Velocity run, invalid in pulse control mode
4	JOG+, invalid in pulse control mode
5	JOG-, invalid in pulse control mode
6	Stop.Slow down and stop, invalid in pulse control mode
7	E-Stop.Quick stop
8	Set position trigger, invalid in pulse control mode, current position is set by addr-321
9	Limit+ signal
10	Limit- signal
11	Origin signal
12	Homing run, invalid in pulse control mode
13	Alarm clear
16	Program run, invalid in pulse control mode
17	Program suspend, invalid in pulse control mode
18	Program stop, invalid in pulse control mode
19	Not Supported
20	Servo ON/OFF control.
21	Move forward for a distance, invalid in pulse control mode
22	Move backward for a distance, invalid in pulse control mode
25	Program select bit0, invalid in pulse control mode
26	Program select bit1, invalid in pulse control mode
27	Program select bit2, invalid in pulse control mode
28	Program select bit3, invalid in pulse control mode
29	Program select bit4, invalid in pulse control mode

The Multi-Program Bit inputs (Bits 0–4) are described in the Multi-Program Operation section later in this manual.

Output Port Configuration

Function No.	General Output
100	Controllable output, controlled by addr 428
101	Alarm out, no output when alarm occurs
102	In-position indication
103	Servo ON/OFF indication, no output when servo ON
104	Running status
105	Torque reached, invalid in pulse control mode
106	Instruction complete, invalid in pulse control mode
107	In negative region, invalid in pulse control mode
108	In center region, invalid in pulse control mode
109	In positive region, invalid in pulse control mode.

3. Parameter Settings

3.1 Interface Overview

The Parameter Settings interface is primarily used to configure motion parameters and perform batch parameter import/export. Most parameters are preconfigured by DINGS engineers. This section describes the commonly used parameters that may require modification, as well as the procedures for parameter import and export.

3.2 Parameter Description

The main parameters used in this software are listed below:

Category	Address	Function
Basic Parameter Settings	298	Communication Baud Rate
Basic Parameter Settings	299	Station Number
Input Port Logic	429	Input Port Logic
Output Port Settings	428	General Digital Output Control
Output Port Settings	430	Output Port Logic

The Communication Baud Rate corresponds to the baud rate setting in the connection interface. The default value is 19200. It can be changed manually if required; however, the selected baud rate must not exceed the maximum value supported by the driver.

The Station Number corresponds to the station number configured in the connection interface. Multiple devices can be connected to the same RS-485 network and communicate via the Modbus protocol. Each device must be assigned a unique station number. Therefore, the station number should be modified as required to enable communication and control of multiple devices on the same network.

The Input Port Logic parameter is used to change the trigger logic of the input ports. The valid setting range is 0–65535. Bits 0–6 correspond to input ports IN1–IN7, respectively. When a bit is set to 1, the logic of the corresponding input port is inverted.

For example, if the value at Address 429 (Input Port Logic) is set to 1, then Bit 0 = 1, which inverts the logic of IN1. In this case, IN1 is triggered by default and is released when an input signal is received.

IN1	IN2	.....	IN7	Value
0	0	.....	0	0
1	0	.....	0	1
0	1	.....	0	2
1	1	.....	0	3
.....	.....	.....		
1	1	.....	1	127

The Output Port Logic parameter is configured in the same manner as the Input Port Logic parameter and will not be described further here.

The General Digital Output Control parameter is used to control the general digital outputs. When a port is configured as a General Output in the Output Port Configuration settings, the output state can be controlled directly through the value of this parameter.

The valid setting range is 0–15. Bits 0–3 correspond to output ports OUT1–OUT4, respectively.

For example, if the value at Address 428 (General Digital Output Control) is set to 1, then Bit 0 = 1, causing OUT1 to output a high-level signal when operating in General Output mode.

OUT1	OUT2	OUT3	OUT4	Value
0	0	0	0	0
1	0	0	0	1
0	1	0	0	2
1	1	0	0	3
.....	.....	.....	.....	.....
1	1	1	1	15

4. Multi-Program Operation

4.1 Multi-Program Function Overview

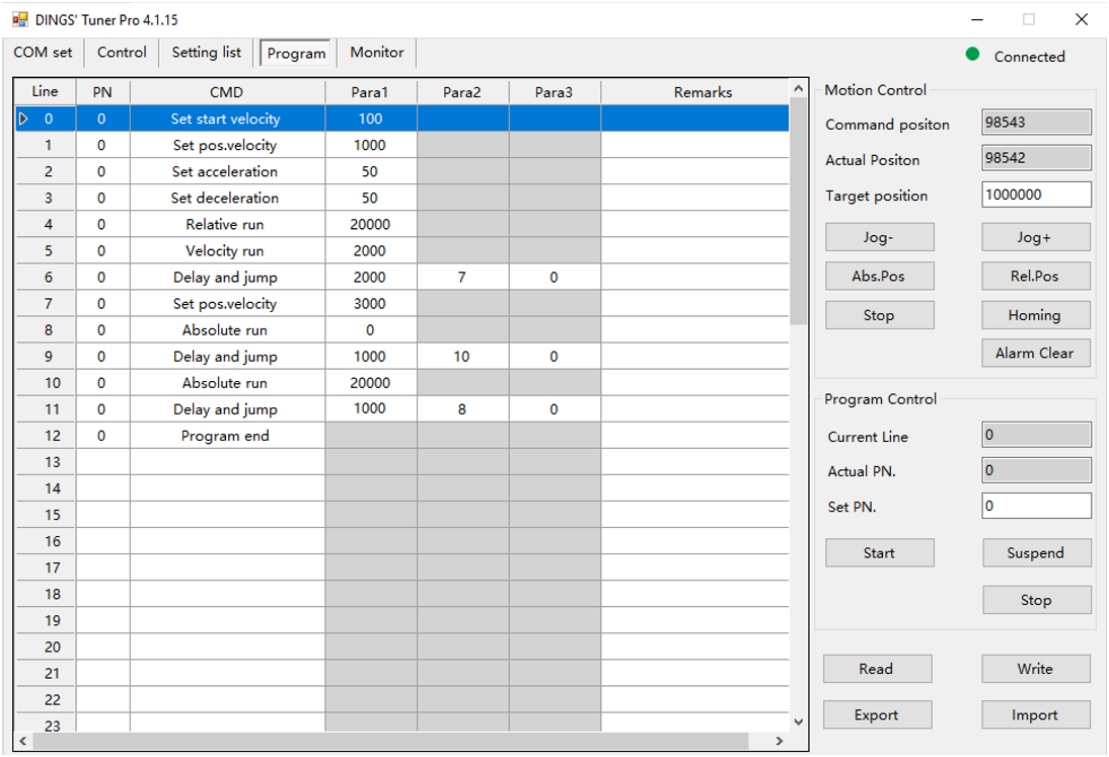
The Multi-Program Position Mode allows multiple position programs to be combined and executed in a predefined sequence. Motion is triggered by external I/O signals, enabling a series of positioning operations to be performed automatically. This function can be regarded as a combination of multiple position-mode commands. Parameters for each program, such as acceleration, deceleration, and pulse count, can be stored in EEPROM in advance. When a program is required, it can be executed simply by providing the corresponding trigger signal.

4.2 Creating Multi-Programs

Multiple programs can be created within a multi-program sequence, with each program defining its own motion profile. Up to 16 programs are supported. Each program must end with an "Program end "command; otherwise, it cannot be executed correctly.

Program commands can be arranged as required. Select the desired command from the command list. For most commands, only Parameter 1 is used to enter the required value. The following sections describe the Delay Jump and Speed Mode commands.

For the Delay Jump command, the first parameter specifies the delay time in milliseconds (ms), the second parameter specifies the target line number, and the third parameter should be set to 0. A delay of at least 1 ms must be configured; otherwise, the command may not operate correctly. In Speed Mode, the motor runs at the configured speed. The operating time can be controlled by adding a Delay Jump command after the Speed Mode command. An example is provided below.



The following example illustrates a multi-program sequence. Lines 0–3 define the operating parameters. Line 4 performs a relative move to a position of 20000. Line 5 starts Speed Mode operation at 20 rps, and Line 6 runs for 2 seconds before jumping to Line 7.

Line 7 sets the position mode speed to 30 rps and performs an absolute move to position 0. Line 9 delays for 1 second and then jumps to Line 10, where an absolute move to position 20000 is executed.

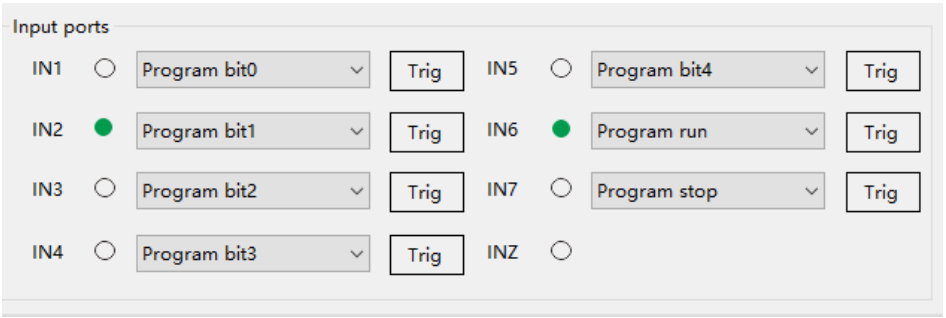
Line 11 delays for 1 second and then jumps back to Line 8, creating a continuous loop. The "Program end "command on Line 12 marks the end of the multi-program sequence.

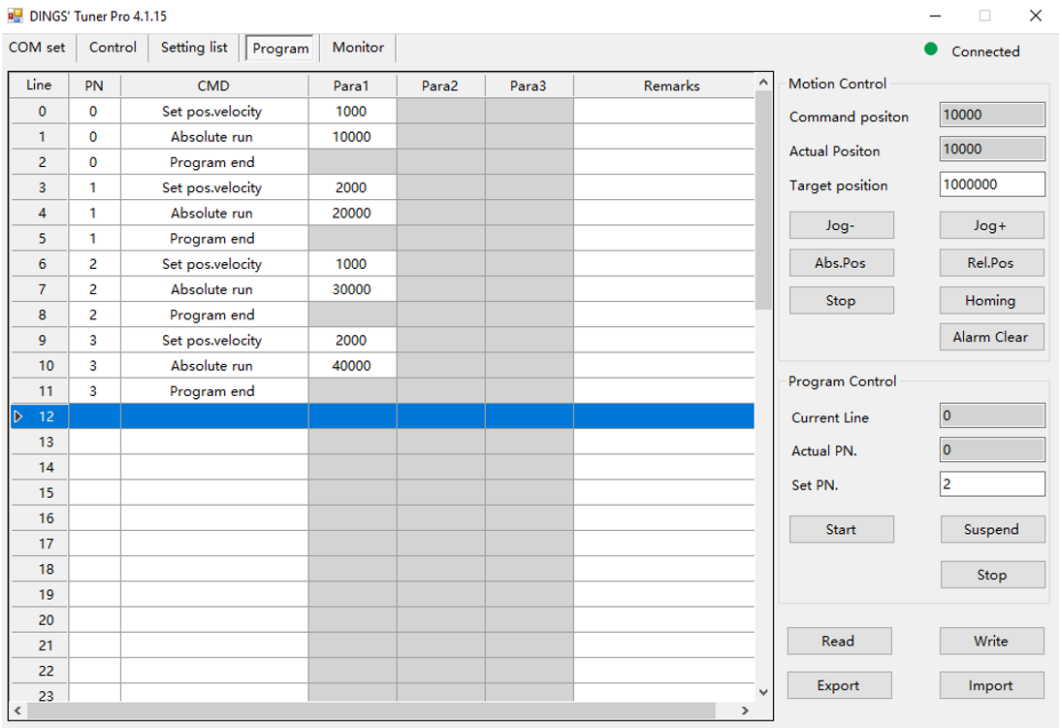
4.3 Multi-Program Selection

Multi-program selection is based on the Program bit inputs, which are configured through the input ports and set to 0 by default. The relationship between the Progam bits and the corresponding program number is shown below:

Bit0	Bit1	Bit2	Bit3	Bit4	Program No.
0	0	0	0	0	0
1	0	0	0	0	1
0	1	0	0	0	2
1	1	0	0	0	3
...	...	...	...		...
1	1	1	1	1	31

For example, when Bit1 is high, Program No. 2 is selected. Triggering "Program run" executes the multi-program sequence assigned to Program No. 2.





In this example, triggering "Program run" will execute Program No. 2, which performs an absolute move to position 30000.

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