

DriverStudio User Manual

Chapter 1 Quick Start Guide

1.1 System Requirements

Before using DriverStudio, please ensure that your computer meets the following requirements:

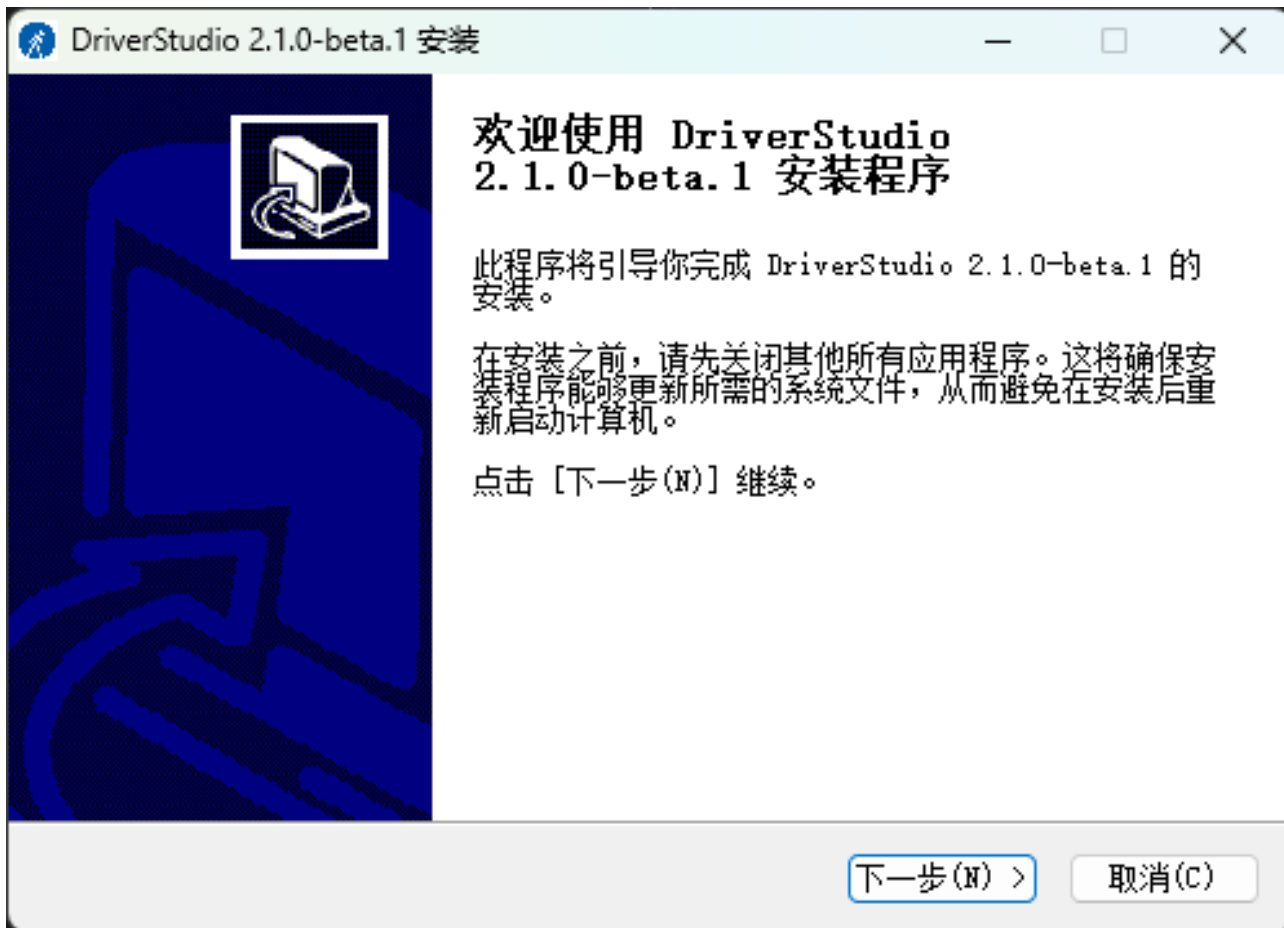
Project	Requirements
Operating System	Windows 10/11 (64-bit)
Processor	Intel Core i5 or higher
Memory	8GB RAM or more
Hard Disk Space	500MB of available space
Interface	USB 2.0/3.0 ports or RS-232/RS-485 serial ports
Monitor	Resolution 1920×1080 or higher

1.2 Software Installation

1.2.1 Obtain the installation package

Obtain the DriverStudio installation package from official channels: - File name: DriverStudio-{version}-win64.exe

1.2.2 Installation Steps



1. Run the installer

- Double-click the installation package file
- If a User Account Control prompt appears, click "Yes"

2. Select installation location

- Default installation path: C:\Program Files\DriverStudio\
- Click "Browse" to select another location

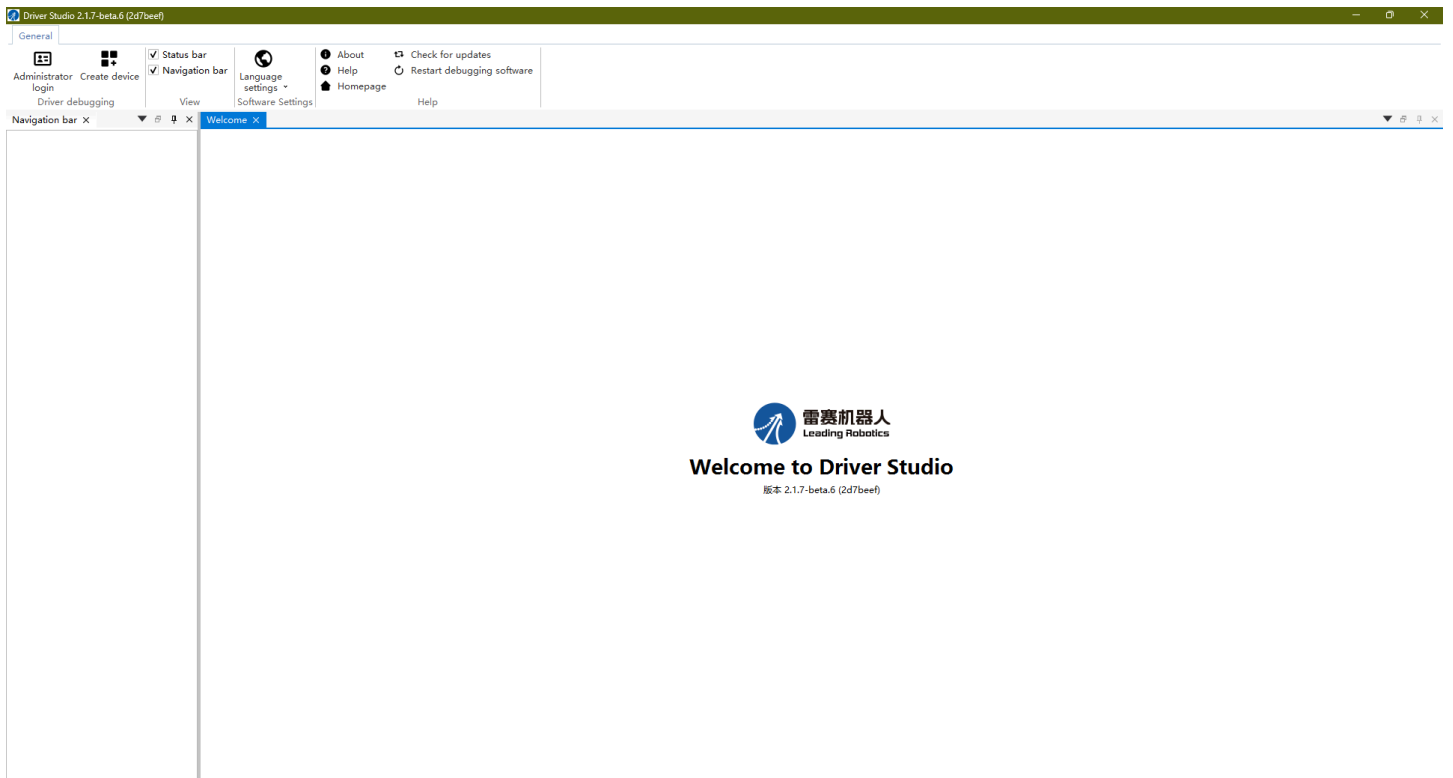
3. Installation Completed

- Click the "Install" button
- Wait for the installation progress to complete
- Click "Finish" to exit the installation wizard

4. Desktop shortcut

- After installation is complete, a shortcut will be created on the desktop
- DriverStudio can also be found from the Start Menu

1.2.3 First Startup



1. Launch the software

- Double-click the desktop shortcut
- or select "DriverStudio" from the Start menu

2. Interface Loading

- The software will display the main interface after startup
- The first startup may take a few seconds to load the configuration

1.3 Get Started in Three Minutes

This guide will help you complete your first device connection and operation in the shortest possible time.

Step 1: Connect the device

1. Physical connection

- Connect the drive to the computer using a USB cable
- Ensure the drive is powered on

2. Connect in the software

- Click the "Create Device" button on the toolbar
- The software will automatically detect available ports
- After selecting the correct port, click "OK".

Step 2: View product information

1. Open the product information page

- Find "Product Information" in the sidebar function tree
- or click the "Product Information" button on the Ribbon toolbar

2. View device information

- The page will automatically display:
- Servo unit model and serial number
- Motor Model and Serial Number
- Encoder Model and Serial Number
- Firmware Version Information

Step 3: Perform a simple test

1. Execute drive reset

- Select "Drive Reset" in the side function tree
- Click the "Execute Reset" button
- After confirming the operation, the device will restart
- Wait about 10 seconds for the device to reconnect

2. View Fault Diagnosis

- Select "Fault Diagnosis" in the side function tree
- Check if there is currently a fault
- If there is a fault, you can view the detailed cause and handling method

1.4 Get Help

If you encounter any problems during use:

1. **View this manual** - Detailed sections explain how to use each function
2. **Fault Diagnosis Page** - Check the "Fault Diagnosis" function to understand the meaning of error codes
3. **Contact Technical Support** - Obtain technical support through official channels

Chapter 2 Software Overview

2.1 Software Introduction

DriverStudio is a professional debugging and management software specifically designed for servo drives. Through an intuitive graphical interface, users can:

- **Manage device connections** - Support USB and serial connections
- **Edit Parameters** - Conveniently view and modify drive parameters
- **Operation Control** - Execute JOG trial run and program operation
- **Encoder Settings** - Perform Origin Search and Magnetic Pole Detection
- **Monitoring Function** - Real-time Monitoring of Parameter Values
- **Waveform Analysis** - Capture and Analyze Internal Signal Waveforms
- **Fault Diagnosis** - View Current and Historical Fault Information

The software adopts modular design, with each function operating independently, making it convenient for users to choose and use according to their needs.

2.2 Overview of Functional Modules

DriverStudio includes the following functional modules:

Basic Functions

Function	Description
Product Information	Check the model and serial number of the drive, motor, and encoder
Drive Reset	Perform a software reset and restart the drive
Fault Diagnosis	View current faults, historical faults, and handling suggestions

Parameter Management

Function	Description
Parameter Editing	Browse, search, and modify parameter values
Parameter Reading	Read parameters from the device to the software

Parameter Writing	Write the parameters in the software to the device
Parameter Saving	Save parameters to file
Parameter Loading	Load parameters from a file into the software

Operation Control

Function	Description
JOG Trial Run	Manual control motor forward/reverse rotation test
Program Execution	Execute the pre-set program operation

Encoder Settings

Function	Description
Origin Search	Perform automatic home return
Magnetic Pole Detection	Perform initial magnetic pole detection of the motor

Monitoring and Analysis

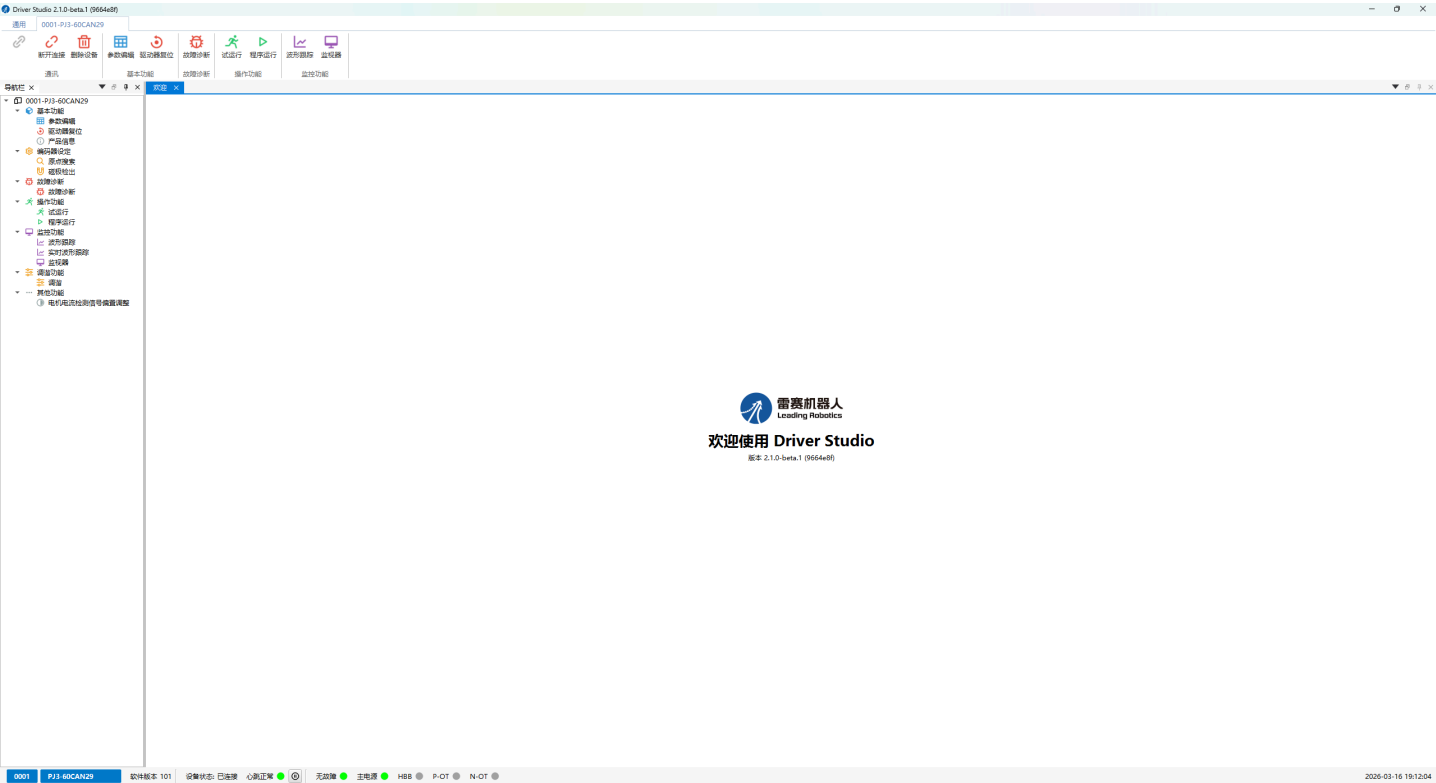
Function	Description
Monitor	Real-time monitoring of parameter value changes
Waveform Tracking	Trigger capture of internal signal waveform
Real-time Waveform	Real-time display of signal waveform

Tuning Tool

Function	Description
Auto Tuning	Auto-adjust gain parameters

2.3 User Interface Layout

The main User Interface of DriverStudio consists of the following parts:



Main Area Description

- **Title Bar** - Displays the software name and the currently open page
- **Ribbon Toolbar** - Quick buttons for common functions, grouped by function
- **Side Function Tree** - Displays all available functions by category, click to switch pages
- **Main Workspace** - Displays the operating interface of the current function
- **Status Bar** - Displays device connection status, current operating mode, and user permission level

2.4 Device Status Indication

The software intuitively displays device status through colors and icons:

Status	Color	Description
Connected	 Green	Device is connected normally and can be operated

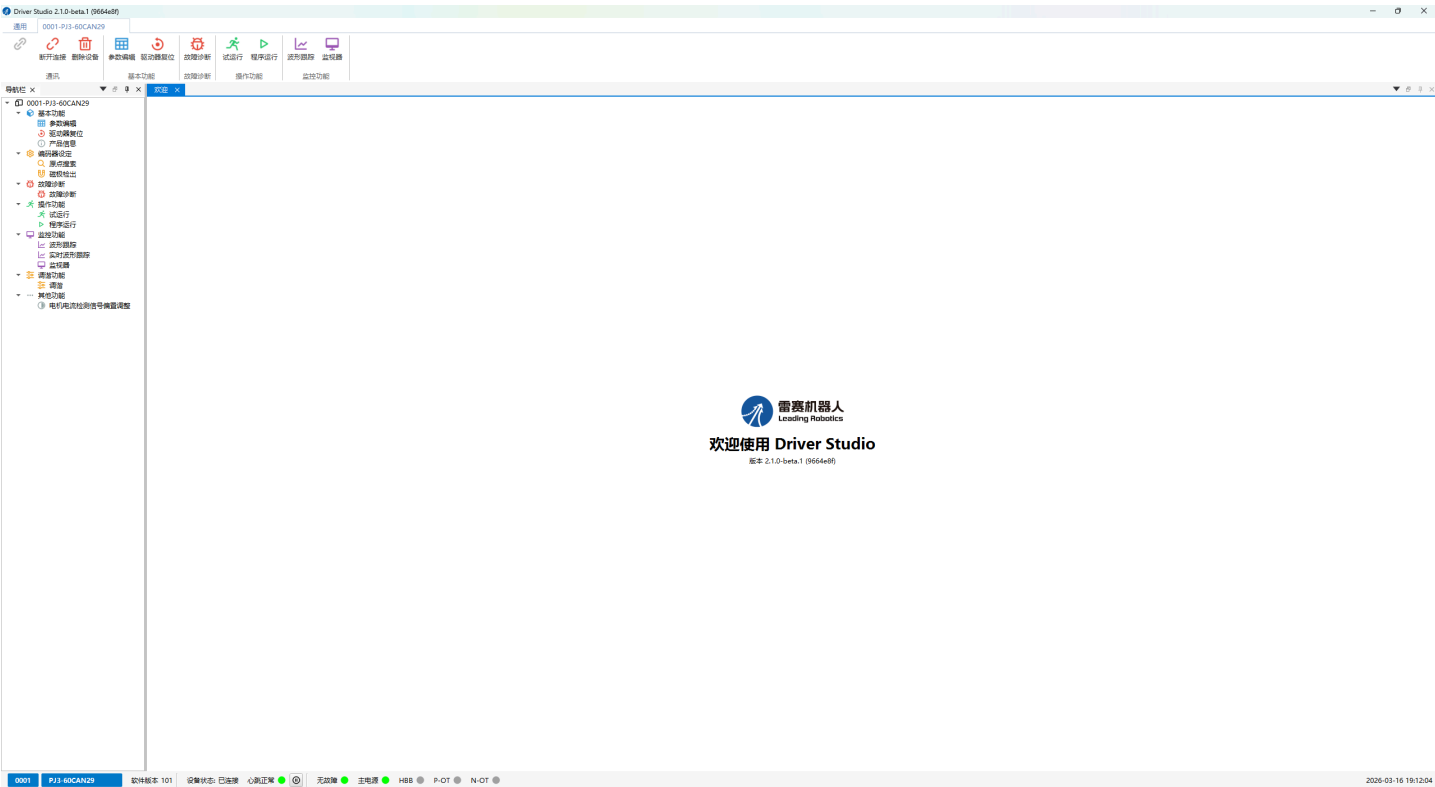
Error	 Red	The device has malfunctioned and needs to be addressed
Disconnect	 Gray	Device not connected

Chapter 3 Interface Introduction

3.1 Main User Interface Layout

After starting DriverStudio, you will see the main User Interface. The main User Interface adopts a modern window layout, with each area having distinct functions:

3.1.1 Interface Area



Region	Location	Function
Title Bar	Topmost	Displays the software name and the current page name
Ribbon Toolbar	Below the title bar	Quick action buttons for commonly used functions, grouped by function

Side Function Tree	Left	Displays all functional categories for page switching
Main Workspace	Central	Displays the operating interface of the current functional page
Status Bar	Bottommost	Displays device connection status and operating mode

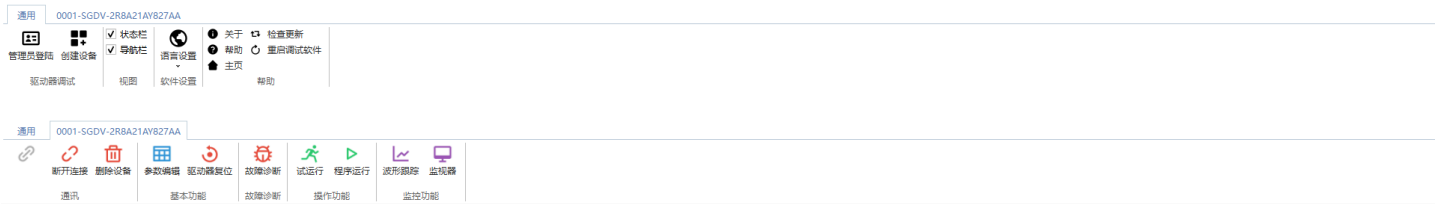
3.1.2 Window Adjustment

- **Maximize/Restore** - Double-click the title bar or click the button in the upper right corner
- **Minimize** - Click the minimize button in the upper right corner
- **Close** - Click the close button in the top right corner

3.2 Ribbon Toolbar

The Ribbon toolbar provides quick access to commonly used functions:

3.2.1 Toolbar Grouping



The toolbar is divided into multiple groups by function:

Group	Contains button
Connect	Connect, Disconnect
Common Functions	Product Information, Drive Reset, Fault Diagnosis
Operation Control	JOG Trial Run, Program Execution
Monitoring	Monitor, Waveform Tracking

3.2.2 Button Style

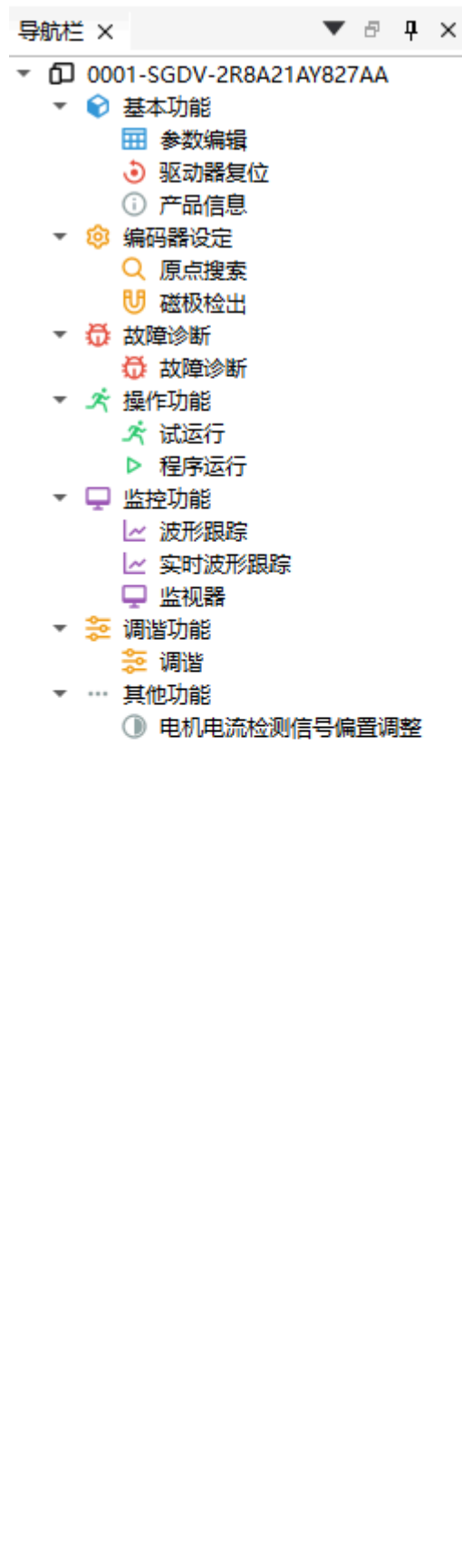
Figure Side Function Tree

- **Icon Button** - Quick Action Button with Icon

- **Dropdown Button** - With a small arrow, click to expand more options
- **Switch Button** - A button that can toggle between on/off states

3.3 Side Function Tree

The sidebar function tree is located on the left side of the main interface, displaying all available functions in a tree structure.



3.3.1 Switching Function

1. **Click on a function item** - Click on any function in the function tree, and the main workspace will display the page of that function
2. **Icon Explanation** - Each function is preceded by a corresponding icon for easy identification

3. **Expand/Collapse** - Click the arrow before the category name to expand or collapse the category

3.4 Main Workspace

The main workspace is the primary operating area of the software, displaying the operating interface of the currently selected function.

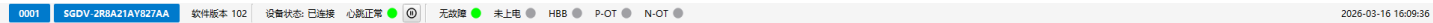
3.4.1 Page Status

The page displays different content based on the device status:

- **Active State** - All controls are available and operations can be performed
- **Inactive state** - Some controls are disabled and displayed in gray
- **Error Status** - Displays error messages, some functions are unavailable
- **Disconnected state** - Displays "Device not connected", most functions disabled

3.5 Status Bar

The status bar is located at the bottom of the main interface and displays important status information.



3.5.1 Status Indication

Information	Location	Description
Device Status	Left	Displays the device connection status (connected/not connected)
Working Mode	middle	Displays the current working mode (e.g., FnMode)
Permission Level	Right side	Displays the current user's permissions (User/Service/Engineer/Factory)

3.5.2 Status Colors

The status bar uses colors to intuitively indicate the device status:

-  **Green** - Device is connected and functioning properly
-  **Red** - Device malfunction
-  **Gray** - Device not connected

3.6 Interface Customization

3.6.1 Adjust the width of the sidebar

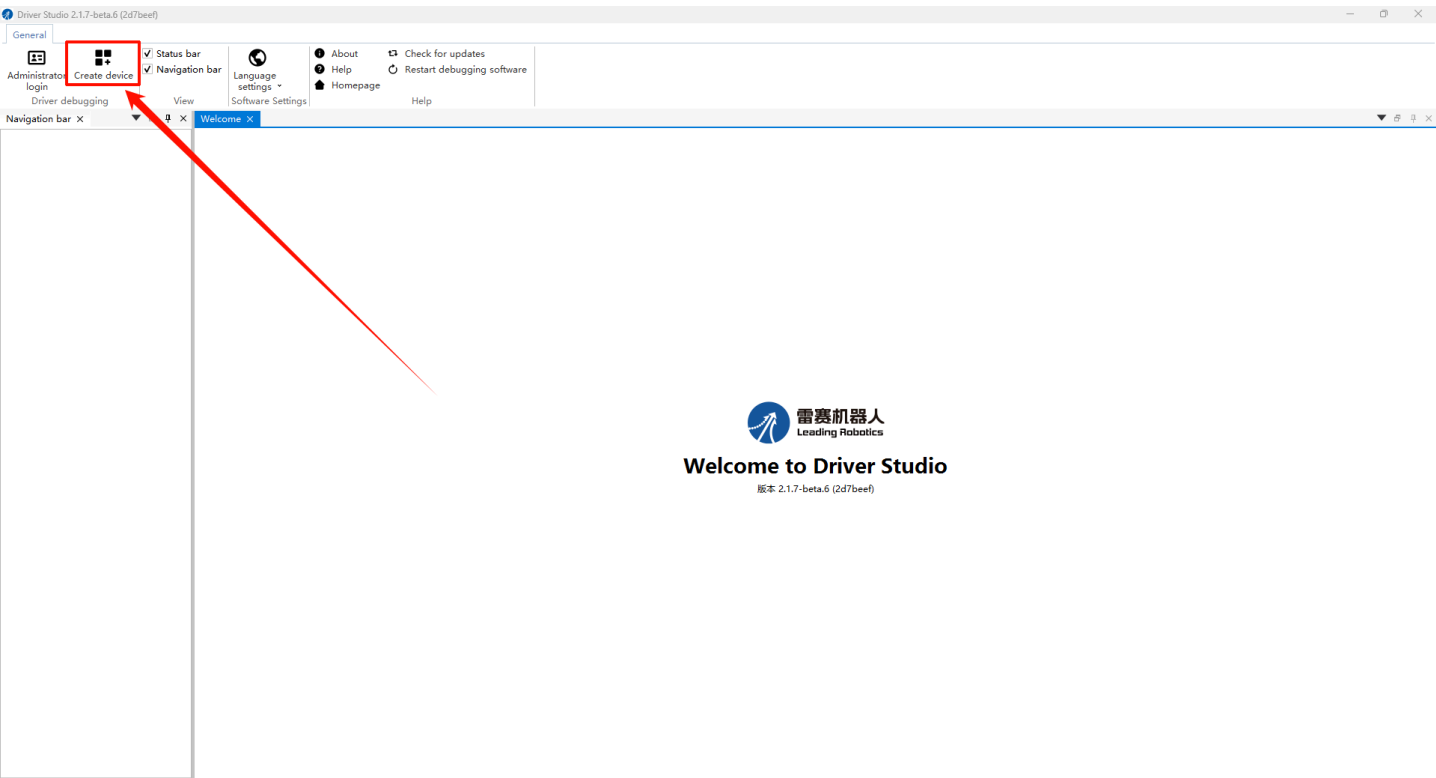
1. Move the mouse to the right edge of the sidebar
2. When the mouse cursor turns into a resize arrow, hold down the left mouse button and drag
3. Release the mouse to complete the adjustment

Chapter 4 Device Connection Management

4.1 Connect the device

The first step in using DriverStudio is to connect to the servo drive device.

4.1.1 Connection Mode

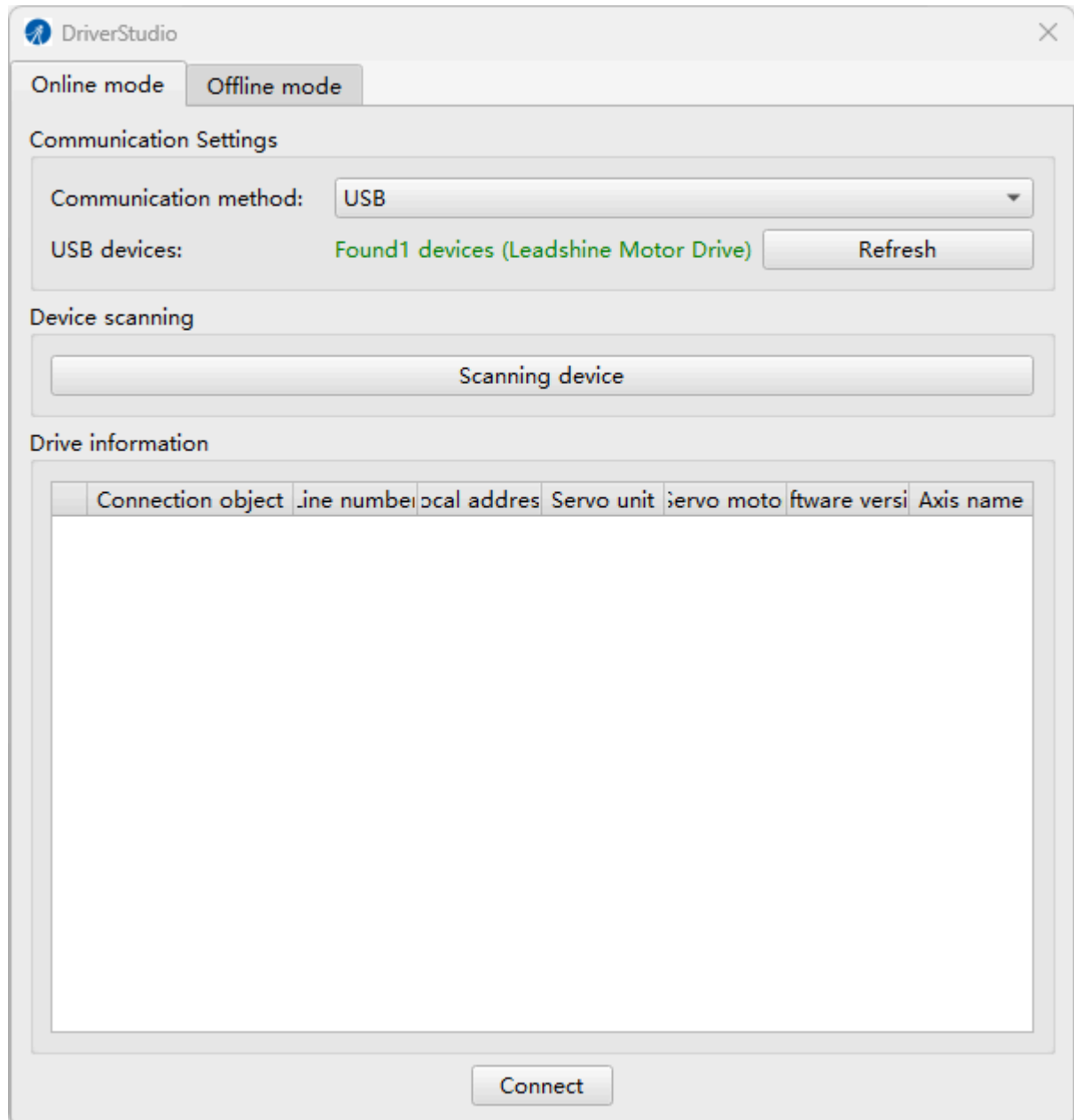


DriverStudio supports the following connection methods:

Method	Description	Applicable Scenarios
USB	Connect via USB cable	

		Most commonly used, supports hot swapping
Serial Port (RS-232/485)	Connect via serial port	Industrial environment, long-distance communication

4.1.2 USB Connection Steps



1. Physical connection

- Connect the drive to the computer using a USB cable
- Ensure the drive is powered on
- The drive will automatically enumerate as a USB device after power-on

2. Connect in the software

- Click the "Create Device" button on the Ribbon toolbar

3. **Connect Dialog**

- The software automatically scans available ports
- Select the correct port from the port list
- Port names usually contain "USB" or the device model
- Click "Scan" to identify the corresponding device(s), as there may be multiple devices here
- Click "Connect" to complete the connection of the selected device

4.2 **Device Identification**

4.2.1 **Port List**

All available ports will be displayed in the connection dialog box:

Column	Description
Port	Port name (e.g., COM3, USB Serial Port)
Description	Port description information (if it includes device model)
Status	Is the port available

4.2.2 **Identify the correct port**

If multiple ports are available, they can be identified by the following methods:

1. **View description information** - includes device model or manufacturer name
2. **Plug-and-play test** - Refresh the list after disconnecting the device, and the disappeared port is the target port
3. **Device Manager** - View ports in Windows Device Manager

4.3 **Connection Status**

4.3.1 **Status Indication**

After a successful connection, the status bar will display the device status:

Status	Color	Description
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Connected	 Green	Device is connected normally and can be operated
Error	 Red	The device has malfunctioned

4.3.2 Connection Information

After a successful connection, the software will display the following information:

- Device Model
- Firmware Version
- Port Name

4.4 Disconnect

4.4.1 Normal Disconnection

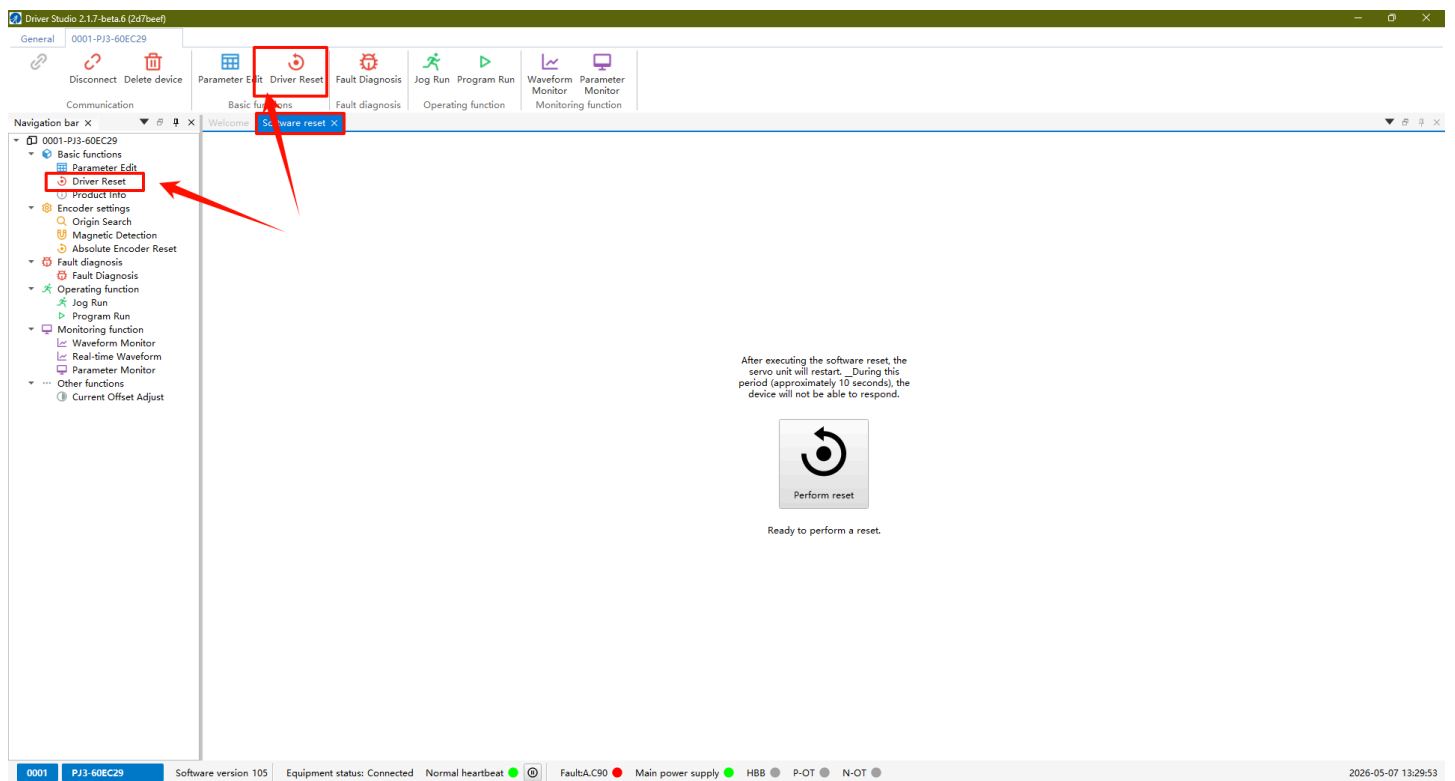
1. Click the Disconnect button

- Click the "Disconnect" button on the Ribbon toolbar

4.4.2 Disconnection Precautions

- **Save data** - Ensure that important parameters or data have been saved before disconnecting
- **Stop movement** - Ensure the motor has stopped running
- **Close function pages** - It is recommended to close all function pages before disconnecting

4.5 Device Reset



The reset function can restart the drive, used to resolve certain software glitches or apply new parameters.

4.5.1 Perform Reset

1. Open the drive reset page

- Select "Drive Reset" in the side function tree
- or click the "Drive Reset" button on the Ribbon toolbar

2. Perform a reset operation

- Click the "Execute Reset" button
- Read the prompt message in the confirmation dialog box
- Click "Yes" to confirm reset

3. Reset Process

- The drive will restart, which takes approximately 10 seconds
- The device will not respond during the reset period

4. Auto Reconnect

- After the reset is completed, the software will automatically reconnect
- Can be used normally after successful connection

4.5.2 Reset Precautions

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Precautions	Description
Save Parameters	Ensure that important parameters have been saved before resetting
Stop moving	Ensure the motor has stopped running
Waiting for completion	Do not disconnect or close the software during the reset
Auto Reconnect	The software will automatically reconnect, no manual operation is required

4.6 Troubleshooting Connection Issues

4.6.1 Device cannot be recognized

Possible causes: - USB cable is damaged - Drive is not powered on - USB driver is not installed

Solutions: 1. Replace the USB cable 2. Ensure the drive is powered on (power indicator is lit) 3. Reinstall the USB driver 4. Try changing the computer's USB port

4.6.2 Connection Timeout

Possible causes: - The port is occupied by another program - Communication parameter settings are incorrect - The USB cable is too long, causing signal attenuation

Solution: 1. Close other programs that may be occupying the port 2. Check the communication parameter settings 3. Use a shorter USB cable (recommended less than 3 meters)

4.6.3 Frequent disconnections

Possible causes: - Poor USB contact - Unstable drive power supply - Poor quality USB cable

Solutions: 1. Re-plug the USB connection 2. Check the power supply of the drive 3. Replace with a better-quality USB cable

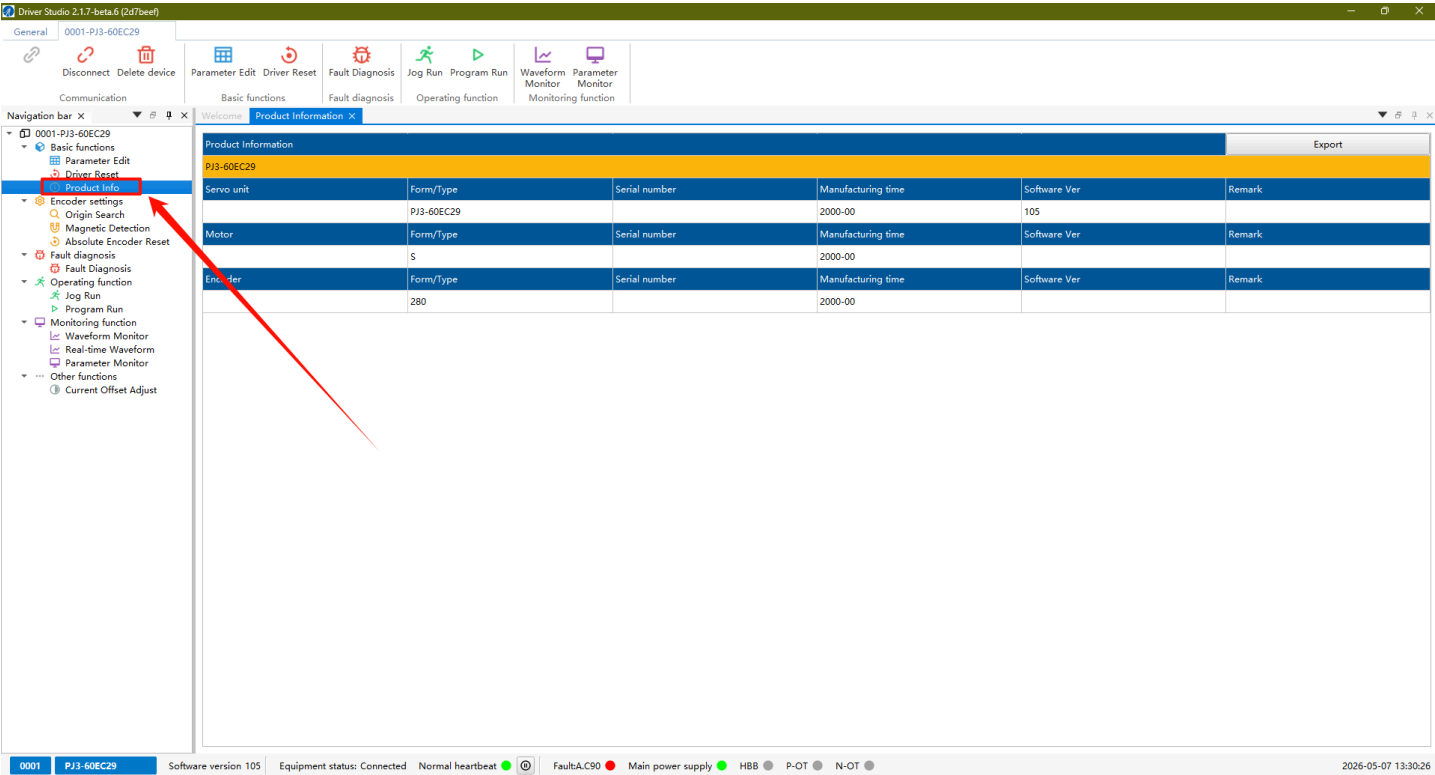
Chapter 5 Basic Function Operations

This chapter introduces the basic functions of DriverStudio, including product information viewing, driver reset, and fault diagnosis. These functions are the most frequently operated in daily use.

5.1 Product Information Viewing

The product information function is used to view detailed model and serial number information of drives, motors, and encoders.

5.1.1 Open Product Information



1. Click "Product Information" in the sidebar function tree
2. or click the "Product Information" button on the Ribbon toolbar

5.1.2 Information Display

The product information page displays the following information in tabular form:

Servo Unit Information

Project	Description
Form/Type	Model of servo drive
Serial Number	The unique serial number of the drive
Manufacturing Time	Production date of the drive
Software Ver	Drive Firmware Version
Remarks	Additional information (if any)

Motor Information

Project	Description

Form/Type	Motor Model
Serial Number	The unique serial number of the motor
Manufacturing Time	Production date of the motor

Encoder Information

Project	Description
Form/Type	Encoder Model
Serial Number	Unique serial number of the encoder
Manufacturing Time	Production date of the encoder

5.1.3 Export Product Information

1. Click the "Export" button in the upper right corner of the table
2. Select the save location and file name
3. Select the save type (CSV file)
4. Click "Save"
5. A prompt message will be displayed after the export is successful

Export Purpose: - Equipment Archive Record - After-sales Service Voucher - Quality Traceability

5.2 Drive Reset

The drive reset function is used to restart the servo drive, which can resolve certain software faults or apply new parameters.

5.2.1 Open drive reset

1. Click "Drive Reset" in the sidebar function tree
2. or click the "Drive Reset" button on the Ribbon toolbar

5.2.2 Perform Reset

Operation Steps

1. **Read the prompt information**
 - The page will display a prompt: "After performing a software reset, the servo unit will restart. During this period (approximately 10 seconds), the device will not respond."

2. Click the "Execute Reset" button

- The button is located in the center of the page and features a reset icon

3. Confirm operation

- will pop up a confirmation dialog box
- Read the prompt and click "Yes" to continue

4. Reset Process

- Status label shows "Reset command sent, waiting for device to restart..."
- button becomes disabled
- Wait for about 10 seconds

5. Reset completed

- The status label displays "Software reset successful!"
- The software will automatically reconnect to the device
- Normal operation is possible after successful connection

Reset Precautions

Precautions	Description
Save Data	Please ensure that important parameters have been saved before resetting
Stop moving	Ensure the motor has stopped running
Waiting for completion	Do not close the software or disconnect during the reset
Auto Reconnect	The software will automatically reconnect, no manual operation is required

5.2.3 Reset Failure Handling

If the reset fails:

1. Check error message

- The status label will display "Reset failed!"
- Pop up a dialog box to display the reason for failure

2. Common Causes

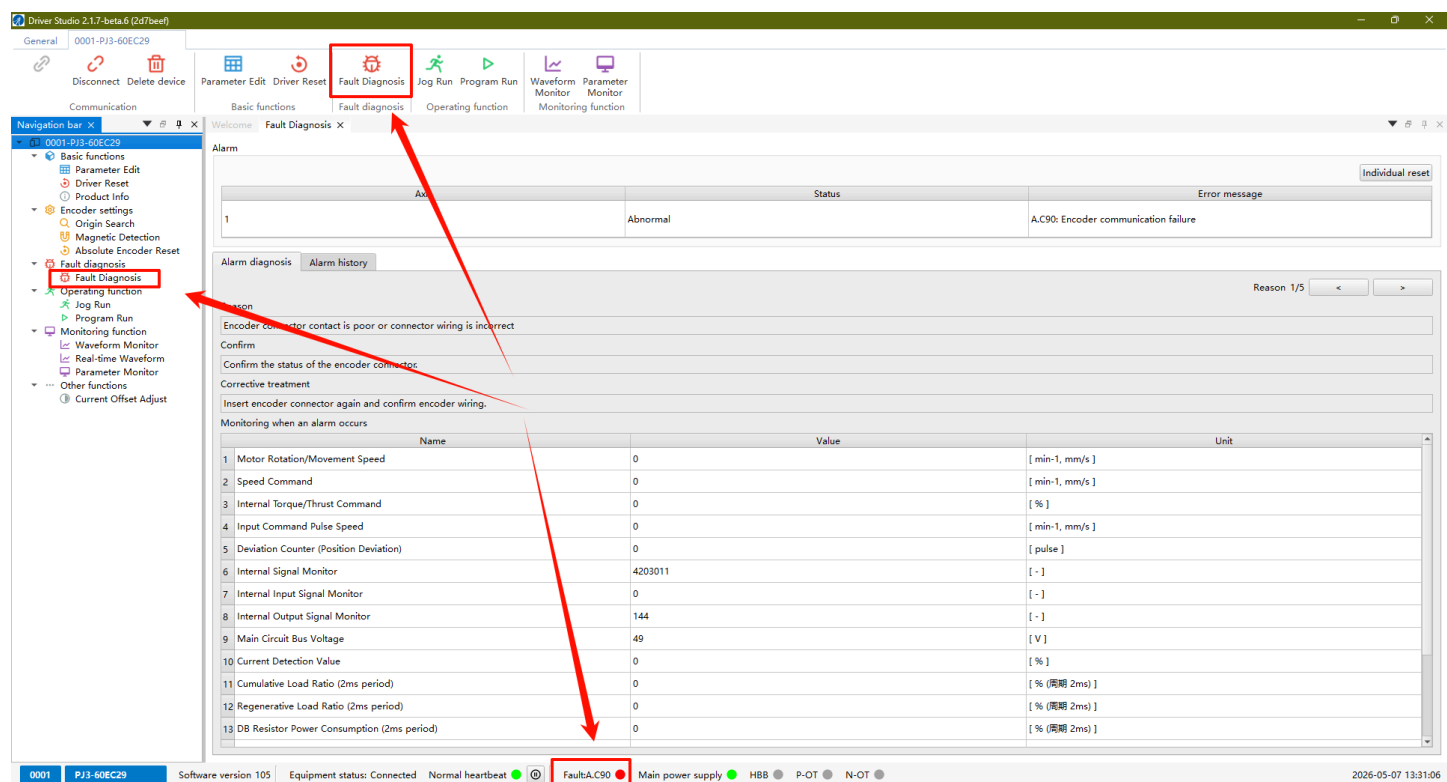
- Device communication anomaly

- The device is already in a fault state
- USB connection is unstable

3. Solution

- Check device connection status
- Clear the fault first, then reset
- Retry after reconnecting the device

5.3 Fault Diagnosis



The fault diagnosis function is used to view current faults, historical faults, as well as detailed information and handling suggestions for faults.

5.3.1 Open Fault Diagnosis

1. Click "Fault Diagnosis" in the side function tree
2. or click the "Fault Diagnosis" button on the Ribbon toolbar

5.3.2 Current Fault Viewing

Top Alert Message

The table at the top of the page shows the current fault status:

Column	Description

axis	Axis number (fixed at 1)
Status	Current Status (Normal/Abnormal)
Error Message	Fault Code and Fault Name

Faulty Operation

- **Individual Reset** - Click the "Individual Reset" button to clear the current fault

5.3.3 Alarm Diagnosis Tab

Click the "Alarm Diagnosis" tab to view detailed information about the fault.

Pagination Navigation

If the fault has multiple causes, you can use the pagination buttons:

Button	Function
<	Previous Page
>	Next Page
-/-	Current Page/Total Pages

Fault Details

Project	Description
Reason	Possible causes of the failure
Confirm	Inspection items for confirming faults
Correction Processing	Recommended handling method

Monitoring when an alarm occurs

The table shows the monitoring parameters when the fault occurred:

Column	Description
Name	Parameter Name
Value	Parameter Value

Unit	Parameter Unit
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5.3.4 Alarm History Tab

Click the "Alarm History" tab to view historical fault records.

History Record Table

Column	Description
NO.	Record Number (1-10)
Name	Fault Name
Accumulated operating time	Operating time at the time of failure (if any)
Remarks	Additional Information
Alarm Tracking Waveform	Waveform data (if any)

Clear Resume

Clicking the "Clear" button can clear all historical fault records.

5.3.5 Fault Handling Process

When a device malfunctions, it is recommended to follow the following process for handling:

- 1. **Check current fault** - Confirm fault code and name
- 2. **View detailed information** - Read the causes and handling methods in "Alarm Diagnosis"
- 3. **Perform reset** - Click "Individual Reset" to clear the fault
- 4. **Check the equipment** - Check and handle according to the recommendations
- 5. **Confirm Recovery** - Confirm that the device has returned to normal operation

5.4 Function Page Status Description

All basic function pages will display different content based on the device status:

5.4.1 Page Status

Status	Description	Control Status
Activity Status	The device is connected and the page is active	All controls are available

Idle state	The page is not activated	Control Disabled
Disconnected State	Device not connected	The control is disabled, displaying "Device not connected"
Error Status	Operation execution failed	Display error message

5.4.2 Status Indication

The page indicates the current status through text, color, icons, etc.

- **Status Label** - Displays the current operating status
- **Button Status** - Enabled/Disabled
- **Color change** - Color distinction between normal/error states

Chapter 6 Parameter Management

Parameter management is one of the core functions of DriverStudio, used to view, edit, save, and load driver parameters.

6.1 Parameter Editing

The parameter editing function provides a convenient interface for browsing, searching, and modifying drive parameters.

6.1.1 Open Parameter Editing

DriverStudio 2.1.7-beta.6 (2d7beef)

General 0001-PJ3-60EC29

Navigation bar %

0001-PJ3-60EC29

Basic functions

Parameter Edit

Driver Reset

Product Info

Encoder settings

Origin Search

Magnetic Detection

Absolute Encoder Reset

Fault diagnosis

Fault Diagnosis

Operating function

Jog Run

Program Run

Monitoring function

Waveform Monitor

Real-time Waveform

Parameter Monitor

Other functions

Current Offset Adjust

Read the selected parameters

Write the selected parameters

Read the parameters of the current page

Write current page parameters

Read all parameters

Write all parameters

Import, Export, Initialization

No.	对象字典	Name	Set value	Current value	Default value	Minimum	Maximum	Unit	d/Write prop fective methc
Pn000		Function selection basic switch 0	0010H	0000H	0000H	0000H	0083H	-	读写 立即生效
Pn001		Function selection application sw...	0102H	0000H	0000H	0000H	1122H	-	读写 立即生效
Pn002		Function selection application sw...	2001H	0011H	0000H	0000H	4113H	-	读写 立即生效
Pn006		Function selection application sw...	0002H	0002H	0000H	0000H	005FH	-	读写 立即生效
Pn007		Function selection application sw...	0000H	0000H	0000H	0000H	005FH	-	读写 立即生效
Pn008		Function selection application sw...	0000H	4000H	0000H	0000H	7121H	-	读写 立即生效
Pn009		Function selection application sw...	0010H	0010H	0000H	0000H	0111H	-	读写 立即生效
Pn00B		Function selection application sw...	0000H	0000H	0000H	0000H	1111H	-	读写 立即生效
Pn00C		Function selection application sw...	0000H	0000H	0000H	0000H	0111H	-	读写 立即生效
Pn00D		Function selection application sw...	0000H	0000H	0000H	0000H	1001H	-	读写 立即生效
Pn010		Function selection application sw...	0001H	0001H	0000H	0000H	007FH	-	读写 立即生效
Pn080		Function selection application sw...	0001H	0000H	0000H	0000H	1111H	-	读写 立即生效
Pn081		Function selection application sw...	0100H	0000H	0000H	0000H	1111H	-	读写 立即生效
Pn100		Speed loop gain	400	400	10	20000	0.1Hz	读写 立即生效	
Pn101		Speed loop integral time constant	2000	2000	15	51200	0.01ms	读写 立即生效	
Pn102		Position loop gain	400	400	10	20000	0.1/s	读写 立即生效	
Pn103		Ratio of moment of inertia	0	100	0	20000	%	读写 立即生效	
Pn104		Second speed loop gain	400	400	10	20000	0.1Hz	读写 立即生效	
Pn105		Integration time constant of the ...	2000	2000	15	51200	0.01ms	读写 立即生效	
Pn106		2nd position loop gain	400	400	10	20000	0.1/s	读写 立即生效	
Pn109		Feedforward	0	0	0	100	%	读写 立即生效	
Pn10A		Feedforward filter time constant	0	0	0	6400	0.01ms	读写 立即生效	
Pn10B		Gain related application switch	0004H	0000H	0000H	0000H	5334H	-	读写 立即生效
Pn10C		Mode switch (torque command)	200	200	0	800	%	读写 立即生效	
Pn10D		Mode switch (speed command)	0	0	0	10000	min-1	读写 立即生效	
Pn10E		Mode switch (acceleration)	0	0	0	30000	min-1/s	读写 立即生效	
Pn10F		Mode switch (position deviation)	0	0	0	10000	指令单位	读写 立即生效	
Pn11F		Position integration time constant	0	0	0	50000	0.1ms	读写 立即生效	
Pn121		Friction compensation gain	100	100	10	1000	%	读写 立即生效	
Pn122		2nd Friction Compensation Gain	100	100	10	1000	%	读写 立即生效	
Pn123		Friction compensation coefficient	0	0	0	100	%	读写 立即生效	
Pn124		Friction compensation frequency...	0	0	-10000	10000	0.1Hz	读写 立即生效	
Pn125		Friction compensation gain cors...	100	100	1	1000	%	读写 立即生效	
Pn131		Gain switching time 1	0	0	0	65535	ms	读写 立即生效	
Pn132		Gain switching time 2	0	0	0	65535	ms	读写 立即生效	
Pn135		Gain switching waiting time 1	0	0	0	65535	ms	读写 立即生效	
Pn136		Gain switching waiting time 2	0	0	0	65535	ms	读写 立即生效	
Pn139		Automatic gain switching related...	0000H	0000H	0000H	0002H	-	读写 立即生效	

设置值已修改 与出厂值不一致 同步失败

0001 PJ3-60EC29 Software version 105 Equipment status: Connected Normal heartbeat FaultA.C90 Main power supply HBB P-OT N-OT 2026-05-07 13:31:54

1. Click "Parameter Editing" in the sidebar function tree
2. or click the "Parameter Edit" button on the Ribbon toolbar

6.1.2 Interface Layout

The parameter editing page is divided into two parts, left and right:

Left: Classification Tree

- Display the classification structure of parameters
- Click on the category to filter the parameter list on the right
- Common Categories:
 - All Parameters
 - Basic Parameters
 - Operating Parameters
 - Adjust parameters
 - Input and Output Settings

Right side: Parameter table

- Displays all parameters under the current category
- Editable parameter value
- Supports multiple selection and batch operations

6.1.3 Parameter Table Description

The parameter table includes the following columns:

Column Name	Description
	Checkbox, used to select parameters
Address	Address of the parameter in the device
OD Index	Object Dictionary Index (if any)
Name	Parameter Name
Set Value	Editable parameter value
Current Value	Actual value read from the device
Default Value	Parameter Default Value

Access	Parameter Access Mode
Effective Mode	Parameter Effective Timing

6.1.4 Browse Parameters

Browse by Category

1. Select a category in the left-hand category tree
2. Automatically displays the parameters under this category on the right side

Search Parameters

1. Enter the parameter name or address in the search box
2. Press Enter or click the search button
3. Matched parameters will be highlighted

6.1.5 Edit Parameters

Modify a single parameter

1. Find the parameter to be modified in the parameter table
2. Click on the cell in the "Set Value" column
3. Enter a new parameter value
4. Press Enter or click elsewhere to complete editing

Batch modify parameters

1. Use checkboxes to select multiple parameters
2. Right-click the selected parameter
3. Select the "Batch Setting" operation
4. Enter a new parameter value

Parameter Type Editing

Different types of parameters have different editing methods:

Parameter Type	Editing Mode
Numerical	Enter a value directly
Enumeration Type	Select from the dropdown list

Bit Field Type	Click to open the bit editing dialog box
----------------	--

6.1.6 Parameter Operation

The following operations can be performed via the right-click menu or toolbar:

Operation	Function
Read Parameters	Read parameter values from the device
Write Parameters	Write the parameter value to the device
Select All	Select all parameters on the current page
Inverse Selection	Reverse Selection
Unselect	Cancel all selections

6.2 Reading and Writing Parameters

6.2.1 Read Parameters

Read parameters from the device into the software.

Operation Steps

- Select the parameter to read**
 - You can select a single, multiple, or all parameters
- Execute Read**
 - Click the "Read" button on the toolbar
 - or right-click the menu and select "Read Parameters"
- Reading Progress**
 - Show Progress Bar
 - Format: Completed/Total (Percentage)
- Read completed**
 - The "Current Value" column is updated to the value read from the device
 - The status bar displays the read result

Reading Precautions

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Precautions	Description
Ensure Connection	Ensure the device is connected before reading
Avoid Interruption	Do not disconnect during the reading process
Retry on Failure	If reading fails, check the connection and try again

6.2.2 Write Parameters

Write the parameter values in the software to the device.

Operation Steps

1. Select the parameter to write

- You can select a single, multiple, or all parameters

2. Check the set value

- Confirm that the values in the "Set Value" column are correct

3. Execute Write

- Click the "Write" button on the toolbar
- or select "Write Parameters" from the right-click menu

4. Confirm Write

- A confirmation dialog may pop up
- Confirm after reading the prompt

5. Writing Progress

- Show Progress Bar
- Format: Completed/Total (Percentage)

6. Write completed

- The status bar displays the write result
- It is recommended to re-read and verify

Writing Notes

Precautions	Description
Confirm the value	Carefully check parameter values before writing

Avoid conflicts	Some parameters require a reset to take effect after being written
Backup Parameters	It is recommended to back up the original parameters before writing
Batch Write	It is recommended to write a large number of parameters in batches

6.3 Parameter File Management

6.3.1 Save parameters to file

Save the current parameters to a file for easy backup and future use.

Operation Steps

1. Select the parameters to save

- can save all or selected parameters

2. Execute Save

- Click the "Save" button on the toolbar
- or Menu "File" → "Save Parameters"

3. Select save location

- Select the save location in the file dialog
- Input file name
- Select the file type (it is recommended to use the default format)

4. Save completed

- Click "Save"
- Show a prompt after successful saving

Save Purpose

- **Parameter Backup** - Save the current configuration for restoration
- **Configuration Sharing** - Share configuration across multiple devices
- **Version Management** - Save parameter configurations of different versions

6.3.2 Load Parameters from File

Load parameters from a file into the software.

Operation Steps

1. Execute Load

- Click the "Load" button on the toolbar
- or Menu "File" → "Load Parameters"

2. Select File

- Select the parameter file in the file dialog box
- Click "Open"

3. Loading completed

- Parameters are loaded into the software
- The "Set Value" column is updated to the values in the file
- Show loading results

Loading Precautions

Precautions	Description
Confirmation Document	Ensure that the correct parameter file is loaded
Check Compatibility	Ensure that the file is compatible with the current device model
Confirm before writing	Reconfirm after loading and before writing to the device

6.4 Parameter Comparison Function

The parameter editing page provides a parameter comparison function, which facilitates viewing parameter differences.

6.4.1 Open the comparison page

1. Right click on the parameter editing page
2. Select "Comparison Parameters"
3. Open Comparison Window

6.4.2 Comparison Content

Comparison window shows:

Comparison Item	Description

Device Value	Current value read from the device
Set Value	Set values in the software
File Value	Value loaded from file (if any)
Default Value	Parameter Default Value

6.4.3 Difference Identification

Different values will be identified by color:

-  **Green** - Values are the same
-  **Red** - Different Values
-  **Yellow** - File value differs from device value

6.5 Best Practices for Parameter Operations

6.5.1 Parameter Modification Process

It is recommended to modify the parameters according to the following process:

1. **Read current parameters** - Read existing parameters from the device
2. **Save Backup** - Save original parameters to file
3. **Modify Parameters** - Modify the required parameter values
4. **Check and Confirm** - Confirm that the modified value is correct
5. **Write to Device** - Write parameters to the device
6. **Verification Results** - Re-read Parameter Verification
7. **Save Configuration** - Save New Configuration to File

6.5.2 Safety Instructions

Prompt	Description
Back up first	Be sure to back up before modifying parameters
Small-scale test	First verify the parameters on the test equipment
Batch modification	A large number of parameter modifications are recommended to be carried out in batches

Record Change	Record the date and reason for parameter modification
Save Configuration	Save the parameter file after each modification

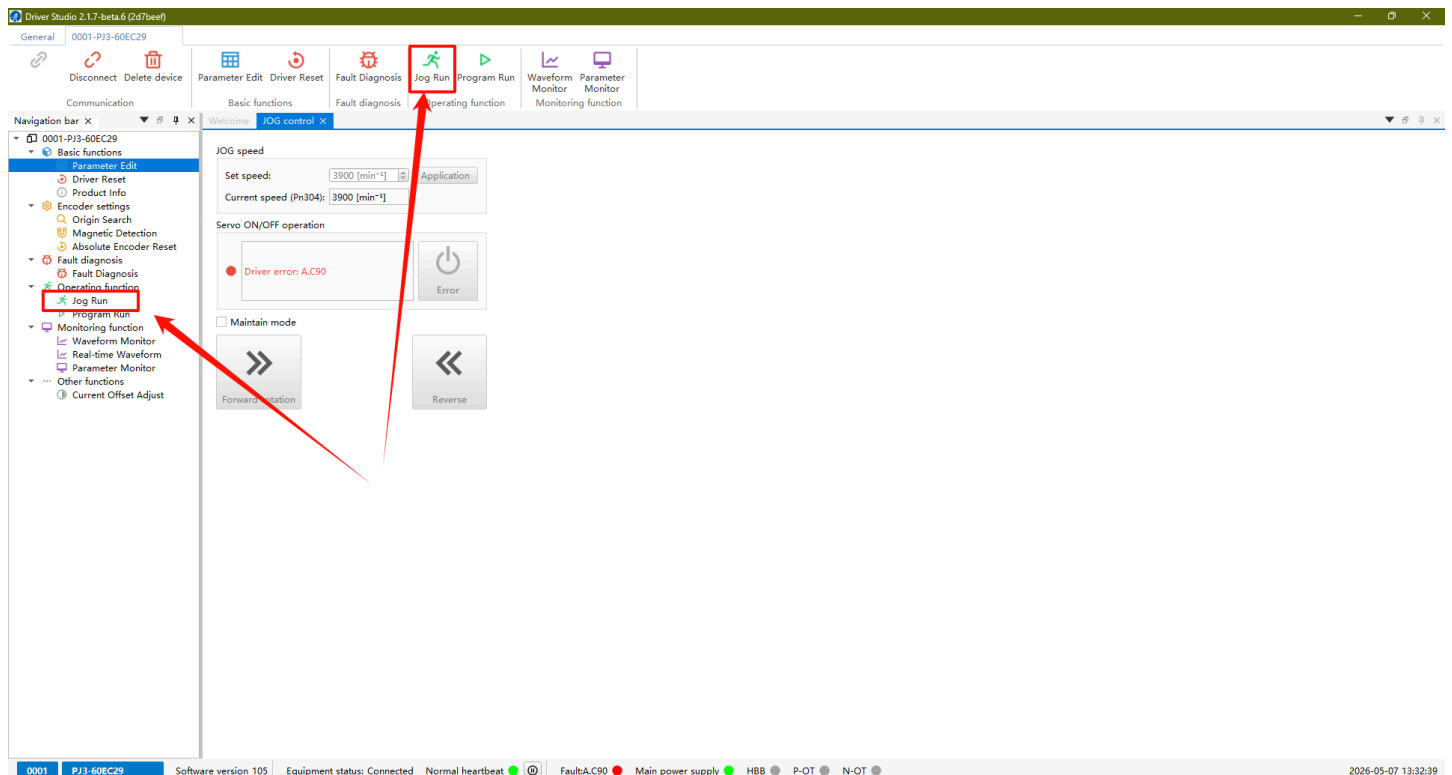
Chapter 7 Operational Control

The operation control function is used for manual testing and verification of the motor's operating status. This chapter introduces the JOG trial run and program operation functions.

7.1 JOG Trial Run

JOG trial run (inching operation) is a test method that manually controls the motor to rotate forward or reverse at a set speed, used to verify the basic functions of the motor and drive.

7.1.1 Turn on JOG trial run



1. Click "JOG Trial Run" in the sidebar function tree
2. or click the "Trial Run" button on the Ribbon toolbar

7.1.2 Interface Description

JOG speed

Set speed: 3900 [min⁻¹] Application

Current speed (Pn304): 3900 [min⁻¹]

Servo ON/OFF operation

● Driver error: A.C90

Power icon
Error

☐ Maintain mode

Forward icon
Forward rotation

Reverse icon
Reverse

The JOG commissioning page includes the following areas:

JOG Speed Setting Area

Control	Function
Set Speed Input Box	Set JOG running speed
Apply Button	Apply the set speed to the device
Current speed display	Display actual speed (Pn304)

Servo ON/OFF Operation Area

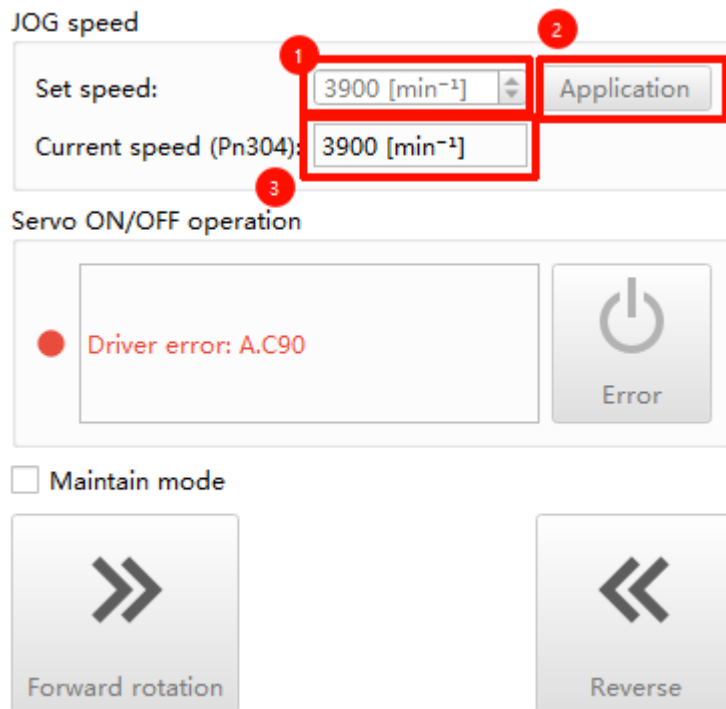
Control	Function
Servo Status Indicator	Display servo switch status
Servo Status Text	Displays "Servo ON" or "Servo OFF"
Servo Button	Switch servo enable status

JOG Operating Area

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Control	Function
Keep Mode Checkbox	Enable Hold Mode
Forward button	Control the motor to rotate forward
Reverse Button	Control the motor to reverse

7.1.3 JOG Operation Process



JOG speed

Set speed: 3900 [min⁻¹] Application

Current speed (Pn304): 3900 [min⁻¹]

Servo ON/OFF operation

Driver error: A.C90

Power button: Error

☐ Maintain mode

Forward rotation

Reverse

Step 1: Set the running speed

1. Enter the speed value in the "Set Speed" input box
2. Speed unit: min⁻¹ (revolutions per minute)
3. Click the "Apply" button to apply the speed to the device
4. The "Current Speed" display will be updated to the actual speed value

Step 2: Start the servo

1. Click the "Servo" button
2. The servo status indicator turns green
3. Status text displays "Servo ON"
4. The forward/reverse button becomes available

Step 3: Execute JOG operation

1. **Jog Mode** (Hold Mode Not Checked)

- Hold the forward/reverse button, and the motor will run
- Release the button, and the motor stops

2. **Hold Mode** (Hold Mode is checked)

- Click the forward/reverse button, and the motor will run continuously
- Click the button again or click another directional button, and the motor stops

Step 4: Stop running

1. Release the forward/reverse button (jog mode)
2. or click the forward/reverse button (hold mode)
3. Motor stops running

Step 5: Turn off the servo

1. Click the "Servo" button
2. The servo status indicator turns red
3. The status text displays "Servo OFF"
4. The forward/reverse button becomes disabled

7.1.4 Speed Setting Instructions

Project	Description
Speed Range	Depending on the device model, usually 0 - 3000 min ⁻¹
Speed Unit	min ⁻¹ (rev/min)
Speed Accuracy	Typically 1 min ⁻¹
Default Speed	Typically 100-500 min ⁻¹

7.1.5 Hold Mode Description

Mode	Operation Mode	Applicable Scenarios
Jog Mode	Press to run, release to stop	Short-time test, precise control
Hold Mode	Click Start, then click Stop	Long-term test, continuous operation

7.1.6 Status Indication

Servo Status Indication

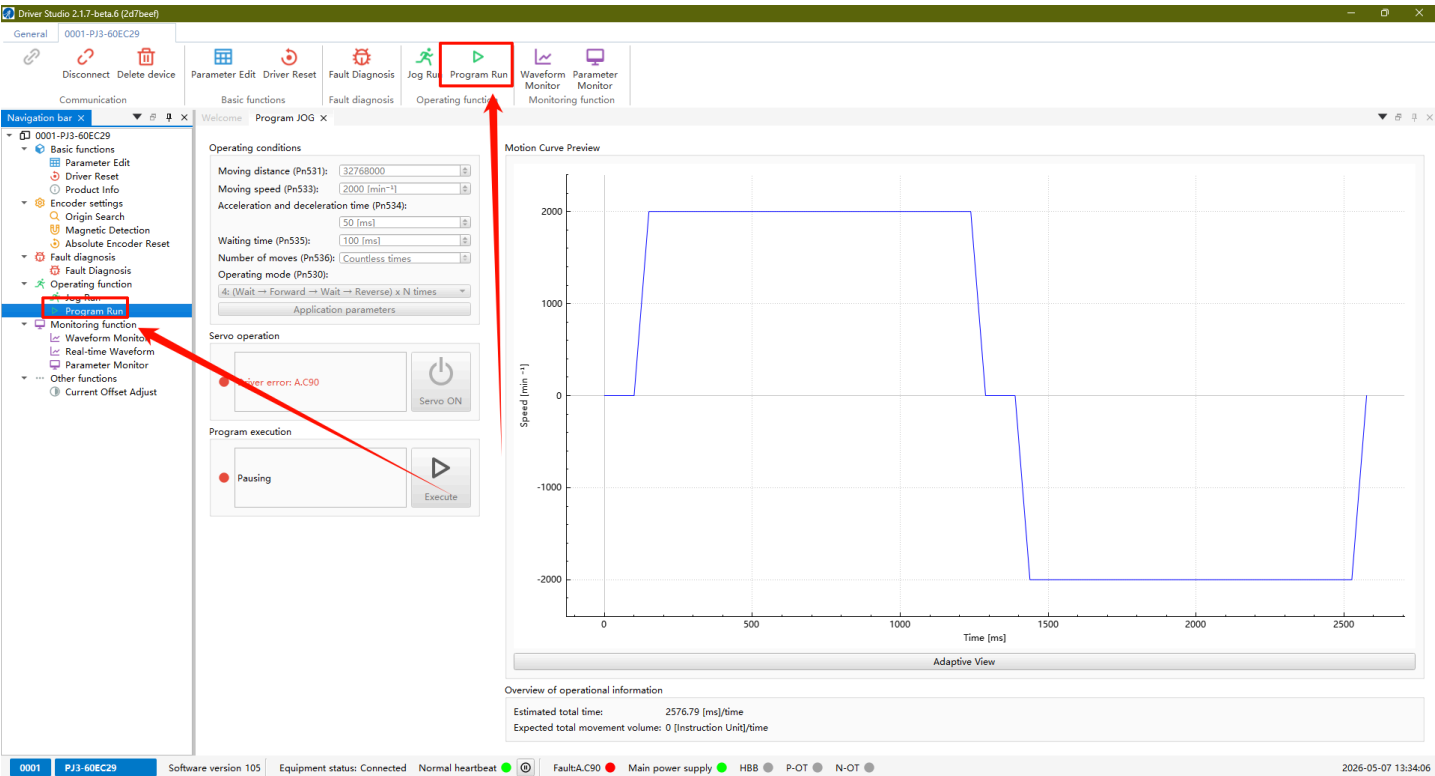
Status	Color	Description
Servo ON	Green	Servo enabled, motor can run
Servo OFF	Red	Servo is disabled, motor cannot operate

Button Status

Status	Description
Available	The button is displayed normally and can be clicked
Disable	The button is grayed out and cannot be clicked
Running	Button pressed state, motor is running

7.2 Program Execution

The program running function is used to execute pre-set programs and implement automated testing processes.



7.2.1 Open the program to run

- 1. Click "Program Run" in the sidebar function tree
- 2. or click the "Run Program" button on the Ribbon toolbar

7.2.2 Interface Description

The program running page includes the following areas:

Region	Function
Program Configuration Area	Configure runtime parameters
Execution Control Area	Start/Stop Program
Status Display Area	Displays the running status and results

7.2.3 Configuration Program

Program Parameters

Program execution usually requires the configuration of the following parameters:

Parameter	Description
Running speed	Speed during program execution
Running Distance/Angle	Distance or angle of motor movement
Acceleration and deceleration time	Acceleration and deceleration time
Running Direction	Forward or reverse rotation
Number of Loops	Number of times the program loop executes

Configuration Steps

- 1. Click the "Configure" button
- 2. Set parameters in the configuration dialog box
- 3. Click "OK" to save the configuration
- 4. Configuration will be displayed on the page

7.2.4 Execution Procedure

Start the program

1. Confirm that the device is connected and the servo is enabled
2. Check if the program configuration is correct
3. Click the "Start" button
4. The program starts executing

Operating Status

When the program is running, the page will display:

Information	Description
Operating Status	Running/Completed/Error
Current Progress	Currently executing step
Running Time	Time elapsed since running
Remaining Time	Estimated Remaining Time

Stop the program

1. Click the "Stop" button
2. Confirm stop operation
3. The program stops executing
4. Motor stops running

7.2.5 Program Execution Results

After the program is completed, it will display:

Project	Description
Execution Status	Success / Failure
Number of Runs	Actual number of loop executions
Running Time	Total running time
Error Message	If an error occurs, display error details

7.3 Precautions for Operational Control

7.3.1 Safety Instructions

Prompt	Description
Confirm the environment	Confirm that the surrounding environment is safe before operation
Fixed Load	Ensure that the load is securely fixed
Prepare for emergency stop	Ensure the emergency stop button is available
Caution: High Speed	Maintain a safe distance when operating at high speed

7.3.2 Operational Specifications

Specification	Description
First at low speed	Use low speed for the first run
Gradually accelerate	Gradually increase the speed after confirming normal operation
Pay attention to the sound	Pay attention to abnormal noises from the motor and drive
Monitoring Status	Pay attention to observing the device status indicator

Chapter 8 Encoder Settings

The encoder setting function is used to initialize and calibrate the encoder. This chapter introduces two core functions: origin search and magnetic pole detection.

8.1 Origin Search

The origin search function is used to perform automatic origin return, moving the motor to the mechanical origin position.

8.1.1 Functional Description

Origin search is an operation to determine the mechanical coordinate origin, typically performed under the following circumstances:

- Device first installation

- After replacing the encoder or motor
- After the mechanical structure adjustment
- After the origin position is lost

8.1.2 Open Origin Search

1. Click "Origin Search" in the sidebar function tree
2. or click "Origin Search" in the "Encoder Settings" group on the Ribbon toolbar

8.1.3 Perform origin search

Operation Steps

1. **Preparation Phase**

- Ensure the device is connected
- Confirm that the servo is enabled
- Ensure that the mechanical structure can move freely
- Confirm that there are no obstacles near the origin

2. **Initiate origin search**

- Click the "Execute Origin Search" button
- Read the prompt in the confirmation dialog box
- Click "Yes" to start execution

3. **Search Process**

- The motor starts moving
- The page displays the search progress
- Status label displays "Searching..."

4. **Search completed**

- The motor stops at the origin position
- The status label displays "Search completed"
- Automatic update of positional parameters

Search Method

Method	Description	Applicable Scenarios
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Unidirectional Search	Search in one direction until the origin signal is detected	When there is an origin switch
Bidirectional Search	Search by first forward rotation and then reverse rotation	When the position of the origin is uncertain

8.1.4 Origin Search Parameters

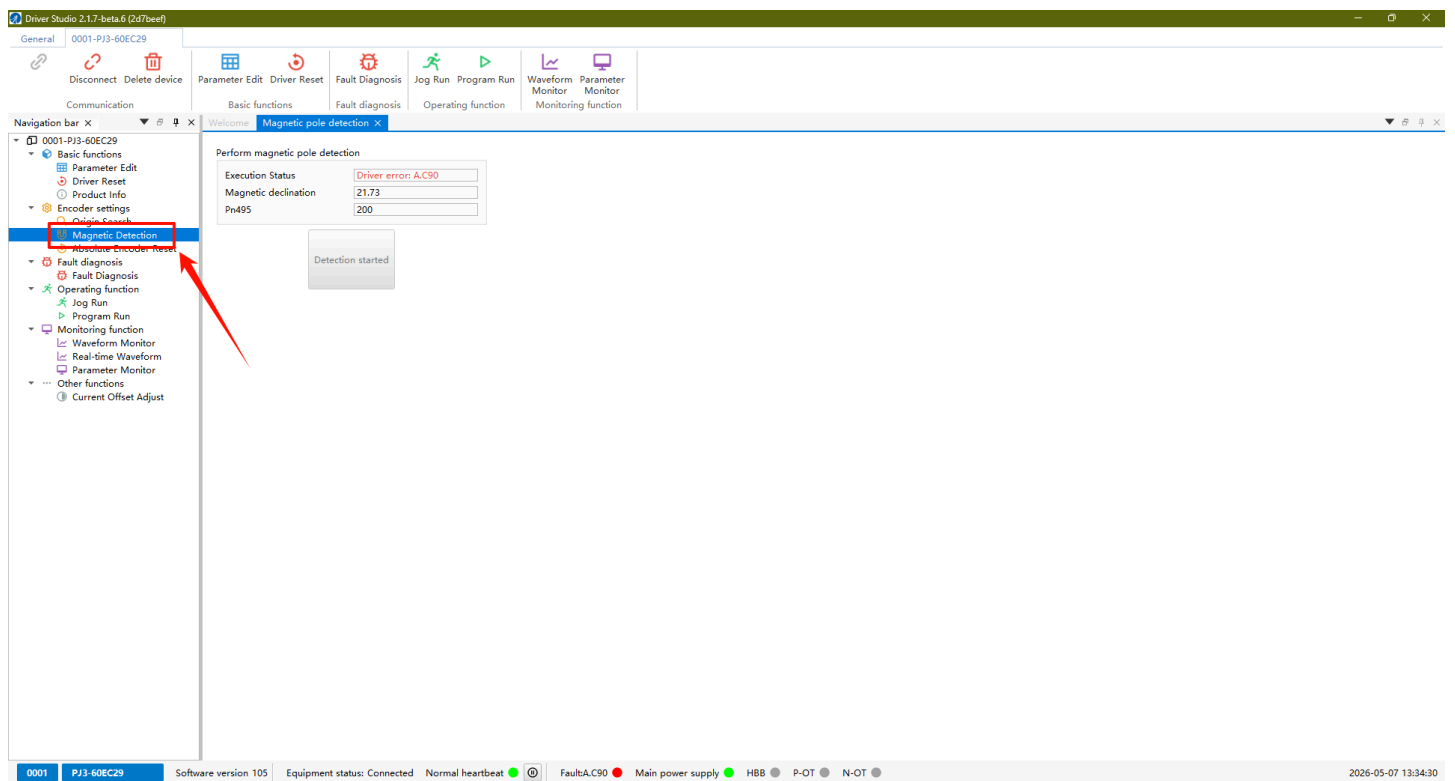
The following parameters may need to be set before execution:

Parameter	Description
Search speed	Operating speed during origin search
Search Direction	Direction of origin search
Zero Return Direction	Return direction after finding the origin

8.1.5 Precautions

Precautions	Description
Confirm safety	Ensure there are no personnel or obstacles within the moving range
Fixed Load	Ensure the load is secured
Reasonable speed	Use appropriate search speed
Waiting for completion	Do not interrupt the operation during the search
Record Location	Record the coordinates of the origin position

8.2 Magnetic Pole Detection



The magnetic pole detection function is used to perform the initial magnetic pole detection of the motor and identify the magnetic pole position of the motor's permanent magnet.

8.2.1 Functional Description

Magnetic pole detection is a necessary step in encoder initialization, which determines the zero position of the encoder by detecting the position of the motor's magnetic poles. Magnetic pole detection needs to be performed in the following situations:

- Device first use
- After replacing the motor
- After replacing the encoder
- After the encoder zero point is lost

8.2.2 Open Magnetic Pole Detection

1. Click "Magnetic Pole Detection" in the sidebar function tree
2. or click "Pole Detection" in the "Encoder Settings" group of the Ribbon toolbar

8.2.3 Interface Description

执行磁极检出

执行状态

检出中 ///

磁偏角

349.77

Pn495

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中止

The magnetic pole detection page contains the following information:

Display Item	Description
Execution Status	Displays the current execution status
Magnetic Declination	Detected magnetic pole angle (E8D parameter)
Pn495	Parameters related to magnetic pole detection

8.2.4 Perform magnetic pole detection

执行磁极检出

执行状态

检出完成

磁偏角

349.77

Pn495

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检出开始

Operation Steps

1. Preparation Phase

- Ensure the device is connected
- Confirm that the servo is enabled
- Confirm that the motor can rotate freely
- Confirm that the load has been unloaded or secured

2. Start magnetic pole detection

- Click the "Checkout Start" button
- Read the prompt in the confirmation dialog box

- Click "Yes" to start execution

3. **Detection Process**

- The motor starts to rotate slowly
- The page displays the "Checking out..." animation
- Real-time display of magnetic declination value

4. **Detection completed**

- The motor stops rotating
- Status shows "Inspection Completed"
- Display the final magnetic declination value

Execution Status Description

Status	Description
Device not connected	Device not connected, unable to execute
Ready	Checkout can begin
Detecting...	Checkout is in progress, with the animation rotating
Detection completed	Detection completed successfully
Detection Failed	Detection failed, displaying error message

8.2.5 Precautions

Precautions	Description
Confirm the environment	Ensure that there are no personnel or obstacles around the motor
Unload the load	It is recommended to remove the load or ensure it is secured
Interference is prohibited	Interfering with the rotation of the motor is prohibited during the inspection process
Record Value	Record the detected magnetic declination value

Regular verification

Regularly verify the magnetic pole detection results

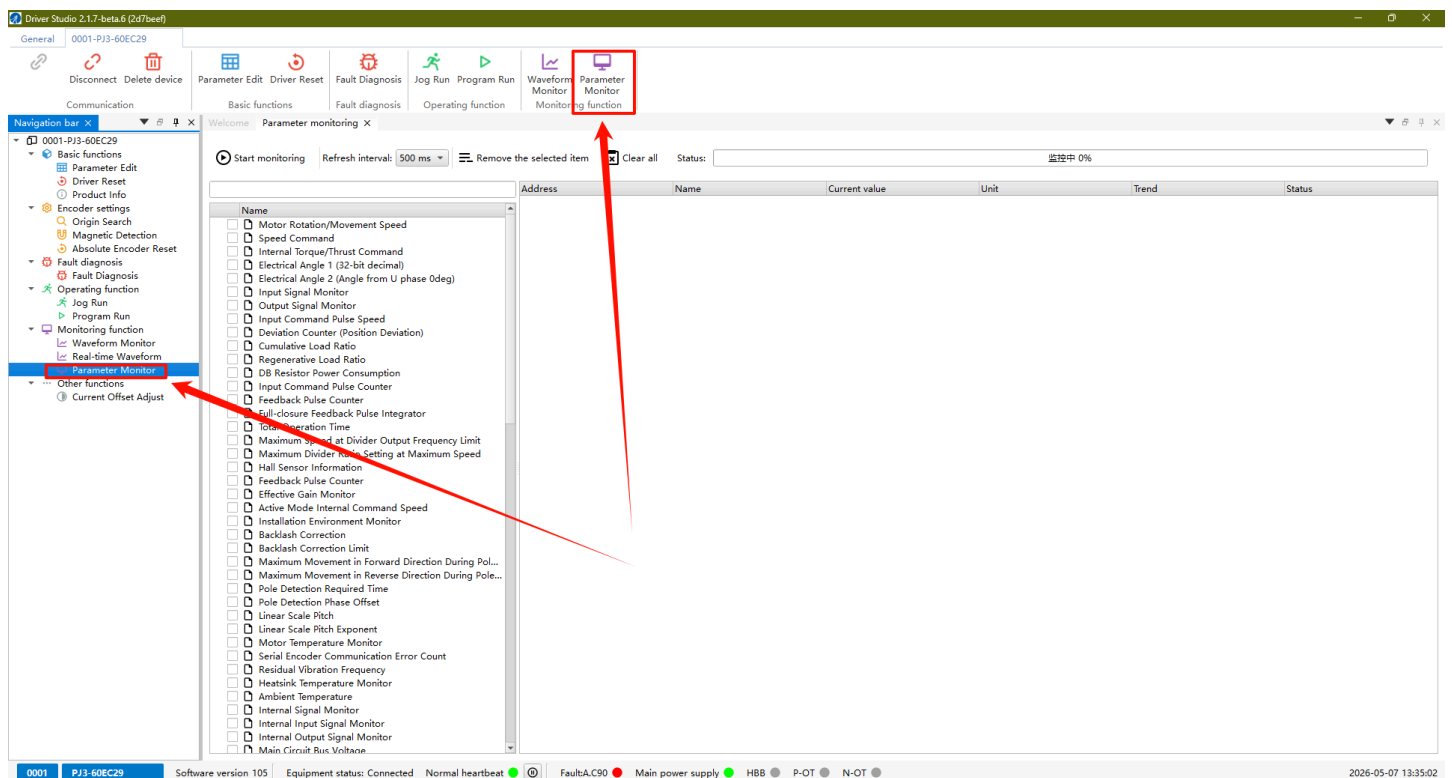
Chapter 9 Monitoring Function

The monitoring function is used to monitor the real-time changes in the parameter values of the drive, helping to understand the operating status of the device. This chapter describes how to use the monitoring function.

9.1 Monitor

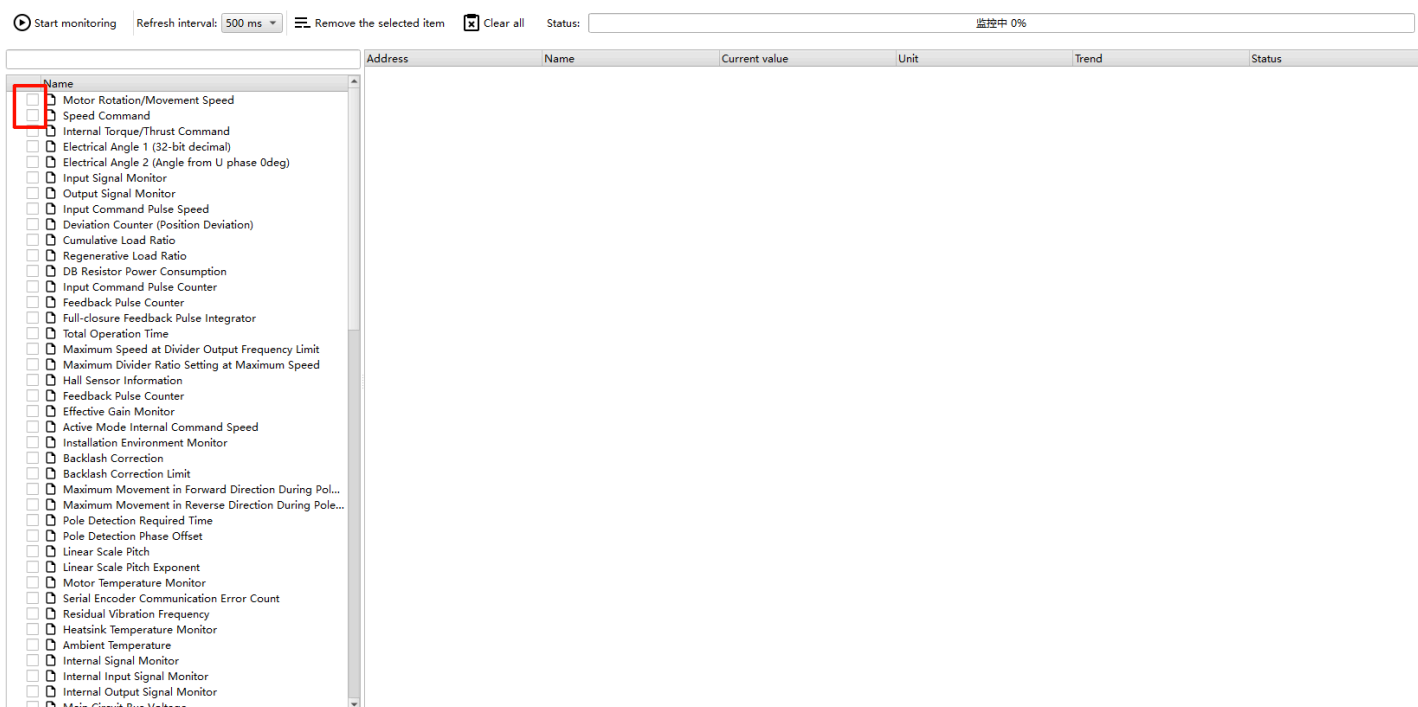
The monitor function can display the values of multiple parameters in real time, suitable for debugging and status monitoring.

9.1.1 Turn on the monitor



1. Click "Monitor" in the sidebar function tree
2. or click the "Monitor" button on the Ribbon toolbar

9.1.2 Interface Description



The monitor page is divided into two parts, left and right:

Left: Parameter Selection Area

- Display the list of monitorable parameters
- Check the parameters to be monitored

Right side: Monitoring data display area

- Displays the real-time values of the selected parameters
- Supports simultaneous display of multiple parameters
- Refresh rate can be selected

9.1.3 Add Monitoring Parameters

Step

1. Find the parameter to be monitored in the left parameter list
2. Check the checkbox before the parameter
3. or click the "Add Selected" button after selecting the parameter
4. The parameter will appear in the right-side monitoring list

9.1.5 Set Refresh Interval

Refresh interval determines the update frequency of monitoring data.

Refresh Interval Option

Option	Interval	Applicable Scenarios
Fast	50ms	High-speed debugging, focusing on instantaneous changes
Normal	100ms	Regular Monitoring
Slow	200ms	Slowly varying parameter
Slower	500ms	Slowly varying parameters such as temperature

Setup Steps

1. Click the refresh interval dropdown box on the toolbar
2. Select an appropriate refresh interval
3. Monitoring data will be updated at the new frequency

9.1.6 Start/Stop Monitoring

Start Monitoring

1. Add parameters to monitor
2. Click the " Start" button on the toolbar
3. The right list starts displaying real-time data
4. Data is updated at the set refresh interval

Stop Monitoring

1. Click the " Stop" button on the toolbar
2. Data update has stopped
3. The current value remains unchanged

9.1.7 Delete Monitoring Parameters

Delete a single parameter

1. Select the parameter to be deleted in the monitoring list on the right
2. Right-click and select "Remove Selected Item"
3. Parameter removed from the monitoring list

Clear All

1. Right-click and select "Clear All" or select "Clear All" from the toolbar
2. Monitoring list cleared

9.1.8 Monitoring Data Description

The monitoring list displays the following information:

Address	Parameter Address (Optional)
Name	Parameter Name
Value	Parameter real-time value
Unit	Parameter Unit

9.2 Monitoring Usage Scenarios

9.2.1 Debugging Scenario

When debugging using the monitoring function:

Step	Operation
1	Add relevant parameters to the monitoring list
2	Set an appropriate refresh interval
3	Start Monitoring
4	Perform debugging operations (such as JOG operation)
5	Observe parameter changes and analyze problems
6	Stop Monitoring

9.2.2 Status Check

Use the monitoring function to check the device status:

1. Add state-related parameters
2. Start Monitoring
3. Observe whether the parameters are within the normal range

- Determine the device status based on the parameter value

9.3 Monitoring Precautions

9.3.1 Performance Considerations

Precautions	Description
Moderate monitoring	Too many monitoring parameters will affect performance
Reasonable Interval	Set the refresh interval as needed
Stop in time	Stop monitoring promptly when not in use
Follow Resources	Pay attention to computer resource usage

9.3.2 Data Accuracy

Precautions	Description
Refresh Rate Limit	The actual refresh rate may be lower than the set value
Communication Delay	Data may have a slight delay
Sampling Interval	Data is discretely sampled
Display Precision	Displayed values may have precision limitations

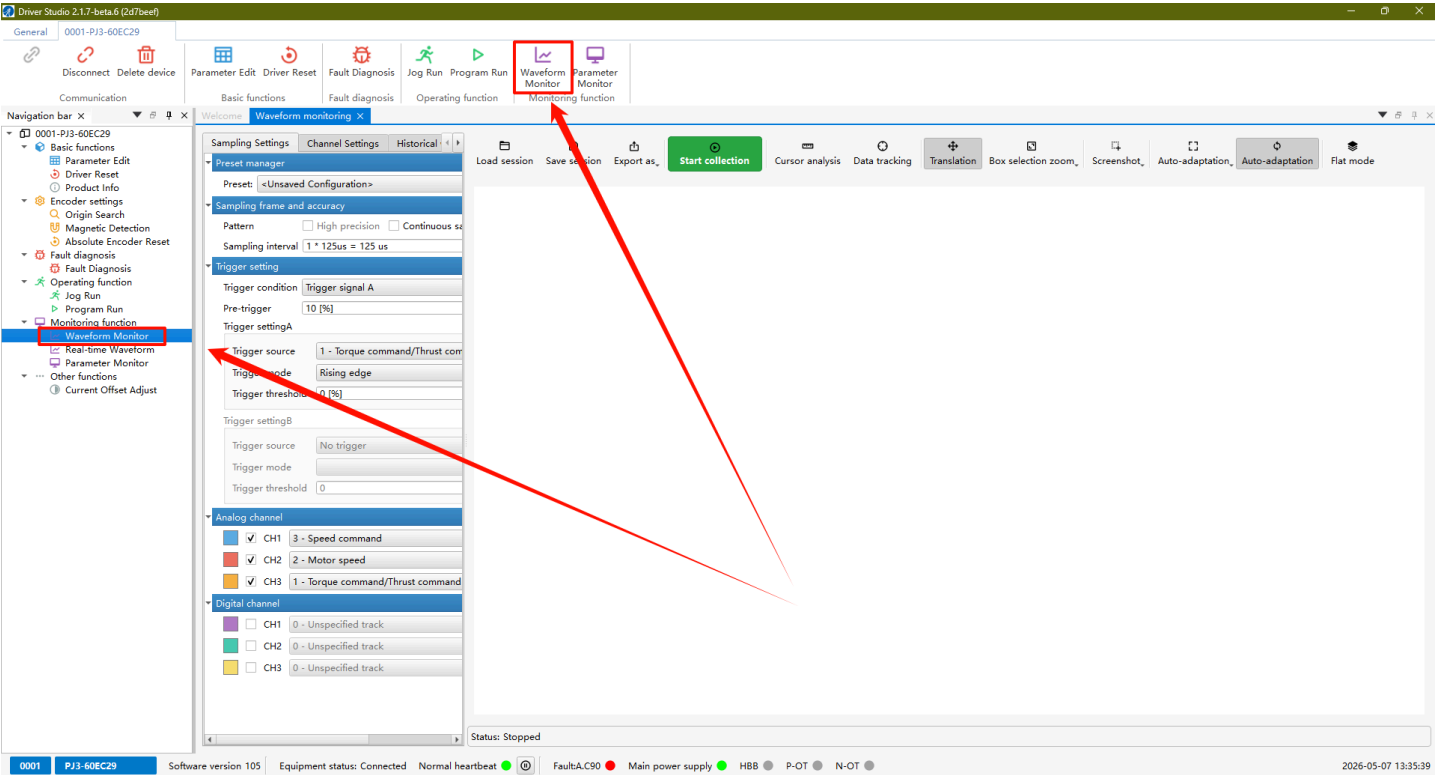
Chapter 10 Waveform Analysis

The waveform analysis function is used to capture and analyze changes in internal signals of the drive, helping to gain in-depth understanding of the device's operating status. This chapter introduces the waveform tracking and real-time waveform functions.

10.1 Waveform Tracking

The waveform tracking (trigger capture) function can capture the signal waveform under specific trigger conditions.

10.1.1 Open Waveform Tracking



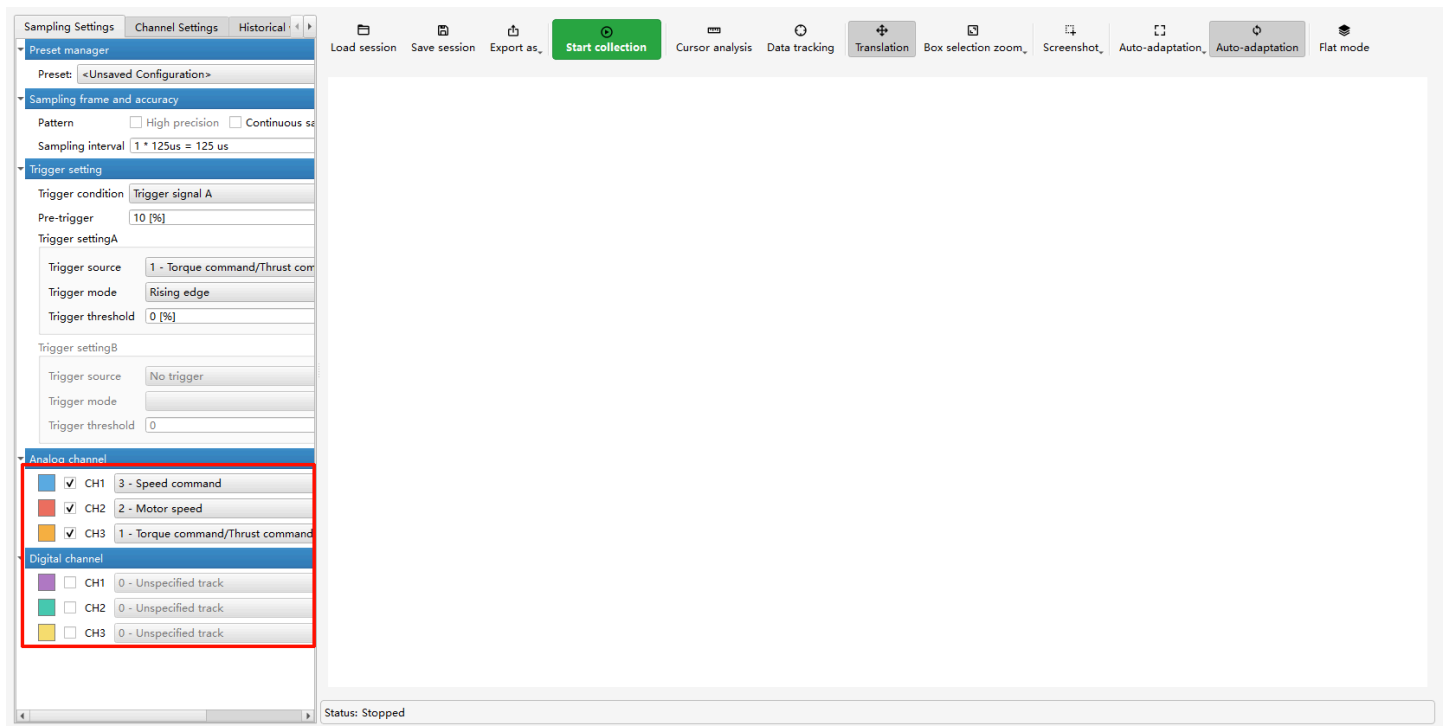
1. Click "Waveform Tracking" in the sidebar function tree
2. Or click the "Waveform Tracking" button on the Ribbon toolbar

10.1.2 Interface Description

The waveform tracking page includes the following areas:

Region	Function
Channel Selection Area	Select the signal channel to capture
Trigger Settings Area	Set trigger conditions
Capture Control Area	Start/Stop Capture
Waveform Display Area	Display the captured waveform
Cursor Information Area	Displays the numerical value of the cursor position

10.1.3 Select Waveform Channel



Available Channels

The drive provides multiple monitorable signal channels: 3 analog data channels and 3 digital data channels

Select Step

1. Check the channels to be captured in the channel selection area
2. Multiple channels can be selected simultaneously
3. Each channel can be individually set to display a color

10.1.4 Set Trigger Conditions

The trigger condition determines when to start capturing the waveform.

Trigger Mode

Method	Description
Manually Trigger	Click the "Capture Now" button to trigger immediately
Rising Edge Trigger	Triggered when the signal rises above the threshold
Falling Edge Trigger	Triggered when the signal drops below the threshold
Window Trigger	

	Triggered when the signal enters or leaves the specified range
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Trigger Parameter

Parameter	Description
Trigger Source	Select the trigger source signal
Trigger Level	Set the trigger level value
Trigger Direction	Rising Edge or Falling Edge
Trigger Position	Capture the position of the trigger point in the window

Setup Steps

1. Select the triggering method in the trigger settings area
2. Select the trigger source signal
3. Set the trigger level
4. Select the trigger direction
5. Set the trigger position (usually 10%-50%)

10.1.5 Start Waveform Capture

Operation Steps

1. Preparation Phase

- Select the channel to capture
- Set trigger conditions
- Set the sampling time (if necessary)

2. Start Capture

- Click the "Start Capture" button
- Wait for the trigger condition to be met
- Waveform automatically captured and displayed

3. Manually Trigger

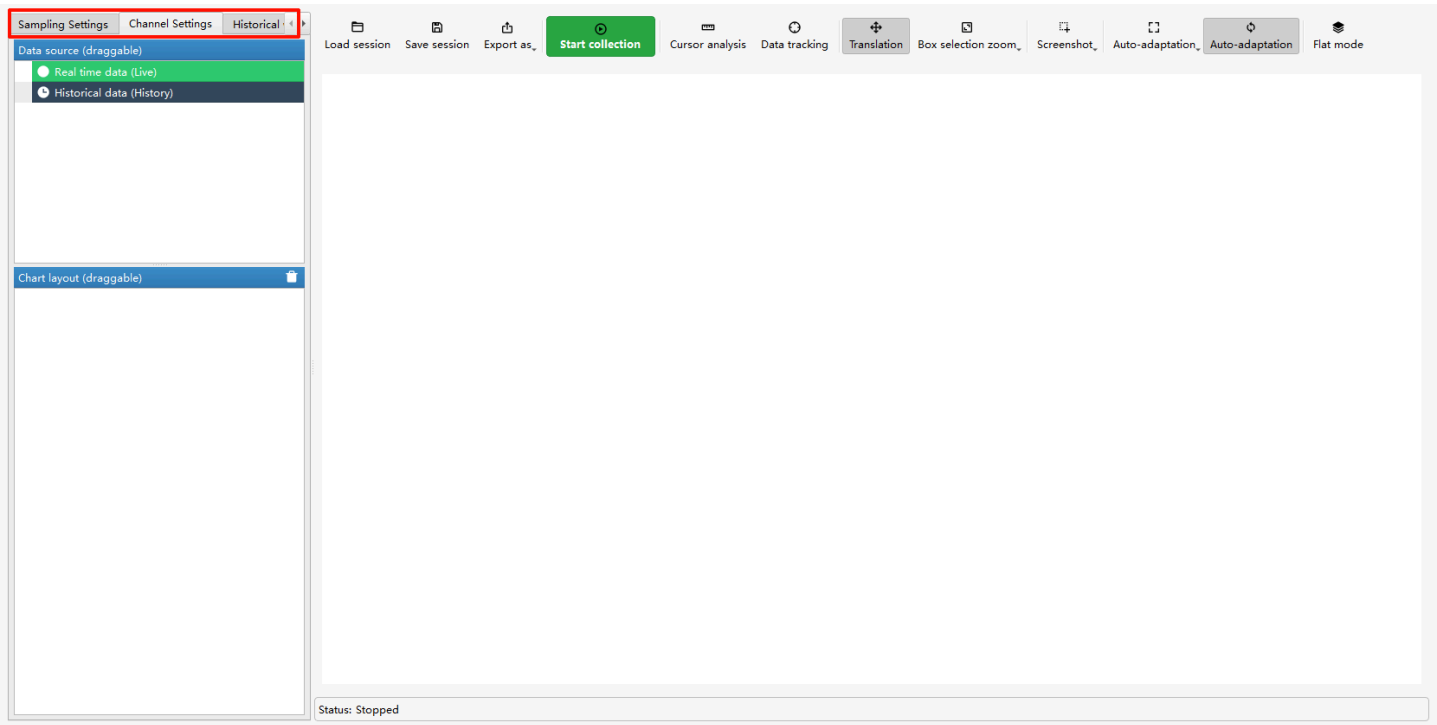
- If the manual trigger method is selected
- Click the "Capture Now" button

- Immediately capture the current waveform

4. **Capture completed**

- The waveform is displayed in the waveform display area
- can be zoomed and panned for viewing
- can save waveform data

10.1.6 View Waveform



Waveform Display

The captured waveform is displayed in the display area in the form of a graph:

Element	Description
Waveform Curve	Signal variation over time
Timeline	The horizontal axis represents time
Amplitude Axis	The vertical axis represents the signal value
Gridlines	Auxiliary Reading
Legend	Identifiers of each channel

Scaling operation

Operation	Function
Mouse Wheel	Zoom centered on the mouse
Zoom Tool	Click and drag the selection area to zoom
Reset Zoom	Restore the original display scale

Translation operation

Operation	Function
Mouse drag	Translate Waveform
Translation Tool	Click and drag to pan the waveform

10.1.7 Cursor Function

The cursor is used for precise measurement of waveform data.

Add Cursor

1. Click the "Cursor Analysis" button
2. Click on the waveform to add a cursor
3. Multiple cursors can be added

Cursor Information

Cursor Information Area Displays:

Information	Description
Time	Time value at the cursor
Value	Signal values of each channel at the cursor
Difference	Time difference and value difference between two cursors

Cursor Operation

Operation	Function
Drag the cursor	Move cursor position

Delete Cursor	Delete the selected cursor
Clear Cursor	Delete all cursors

10.1.8 Save Waveform

Save as Image

1. Click the "Screenshot" button
2. Select the save location and file name
3. Select the image format (PNG or JPG)
4. Set image size (optional)
5. Click "Save"

Export Data

1. Click the "Export As" button
2. Select the save location and file name
3. Select file format (CSV or wfsession)
4. Click "Save"

10.2 Real-time Waveform Tracking

The real-time waveform tracking function is used to continuously display the signal waveform without the need for a trigger condition.

10.2.1 Turn on real-time waveform tracking

1. Click "Real-time Waveform Tracking" in the sidebar function tree
2. or click the "Real-time Waveform" button on the Ribbon toolbar

10.2.2 Differences from Waveform Tracking

Feature	Waveform Tracking	Real-time waveform tracking
Trigger Mode	Trigger conditions are required	No need to trigger
Display Mode	Single Capture	Continuous Display
Usage	Capture specific events	Observe continuous change
Refresh Rate	Higher	Lower

10.2.3 Using Real-Time Waveforms

Start real-time display

- 1. Select the channel to display
- 2. Click the "Start Display" button
- 3. Waveform starts continuous display
- 4. Display the latest waveform data

Stop real-time display

- 1. Click the "Stop Displaying" button
- 2. Waveform stops updating
- 3. Current waveform remains displayed

10.3 Waveform Analysis Techniques

10.3.1 Capture Techniques

Technique	Description
Reasonably set the trigger point	The trigger point is set at the 20%-40% position, allowing the waveforms before and after the trigger to be observed
Select an appropriate sampling rate	The sampling rate should be 5-10 times the signal frequency
Limit the number of channels	Only capture necessary channels to improve performance
Pre-test	First test with a low sampling rate, then increase the accuracy

10.3.2 Analytical Techniques

Technique	Description
Measure using a vernier	Precisely measure time difference and amplitude difference

Zoom in on local details	Zoom in on the area of interest to view details
Multi-channel Comparison	Simultaneously view the correlated changes of multiple channels
Save Key Waveforms	Save abnormal waveforms for analysis