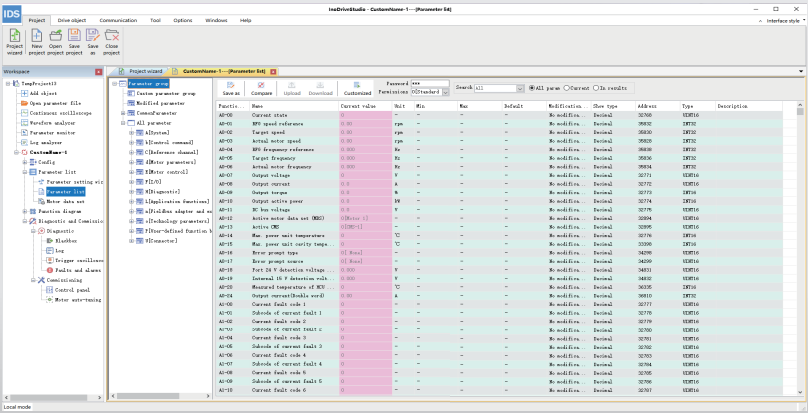
INOVANCE

FORWARD, ALWAYS PROGRESSING



# InoDriveStudio

## Online Help

Industrial Automation

Intelligent Elevator

New Energy Vehicle

Industrial Robot

Rail Transit

Data code PS00018559A00

# Table of Contents

Preface . . . . . 4
1 Introduction . . . . . 8
1.1 Supported Products . . . . . 8
1.2 Terms and Abbreviations . . . . . 8
2 Descriptions of InoDriveStudio . . . . . 11
2.1 About InoDriveStudio . . . . . 11
2.2 Major Functions . . . . . 11
2.3 System Requirements . . . . . 11
2.4 Technical Support . . . . . 12
3 Installating and Uninstalling InoDriveStudio . . . . . 13
3.1 Installing the Software . . . . . 13
3.1.1 Authorized Installation . . . . . 13
3.1.2 Installing the Installable Version . . . . . 14
3.1.3 Installing the Portable Version . . . . . 17
3.2 Uninstalling the Software . . . . . 17
3.2.1 Uninstalling the Installable Version . . . . . 18
3.2.2 Uninstalling the Portable Version . . . . . 19
4 User Interface . . . . . 21
4.1 Main Interface . . . . . 21
4.2 Menu Bar . . . . . 22
4.2.1 Project . . . . . 22
4.2.1.1 Project Wizard . . . . . 22
4.2.1.2 Creating a Project . . . . . 22
4.2.1.3 Opening the Project . . . . . 30
4.2.1.4 Saving the Project . . . . . 31
4.2.1.5 Saving the Project as . . . . . 31
4.2.1.6 Closing the project . . . . . 32
4.2.2 Drive Object . . . . . 32
4.2.3 Communication . . . . . 34
4.2.4 Options . . . . . 35
4.2.5 Windows . . . . . 35
4.2.6 Help . . . . . 36
4.2.7 Interface Style . . . . . 36
4.3 Workspace . . . . . 37
4.4 Project Wizard . . . . . 38
4.5 Multi-function Area . . . . . 39
4.6 Status Bar . . . . . 40

5 Connect ..... 41
5.1 USB(SOP-20-880/MDKE10) ..... 41
5.1.1 Overview ..... 41
5.1.2 Keys and Display ..... 42
5.1.3 Connecting the Relay to PC ..... 46
5.2 TCP/IP(HETN-10/HPCU/HPFN-20/HEIP-10) ..... 49
5.2.1 Overview ..... 49
5.2.2 Status Indicators ..... 50
5.2.3 Connecting to the PC ..... 51
5.3 TCP/IP(HGW-10) ..... 55
5.3.1 Overview ..... 55
5.3.2 Status Indicators ..... 55
5.3.3 Connecting to the PC ..... 56
6 Basic Functions ..... 60
6.1 Parameter Setting Wizard ..... 60
6.2 Parameter List ..... 60
6.2.1 Overview ..... 60
6.2.2 Parameter List Interface ..... 60
6.2.3 Viewing and Modifying Parameters ..... 61
6.2.4 Parameter Comparison ..... 65
6.2.5 Parameter Backup and Download ..... 69
6.2.6 Custom Parameter Group ..... 71
6.2.7 Common Parameters ..... 74
6.2.8 Parameter Monitoring List ..... 76
6.2.9 Parameter File ..... 79
6.3 Motor Data Set ..... 80
6.4 Configuring the Drive Object ..... 82
6.5 Process Data Configuration ..... 86
6.6 Waveform Recording and Analysis ..... 87
6.6.1 Overview ..... 87
6.6.2 Continuous Oscilloscope ..... 87
6.6.3 Trigger Oscilloscope ..... 94
6.6.4 Black Box ..... 98
6.6.5 Waveform Analyzer ..... 101
6.7 Diagnosis and Commissioning ..... 104
6.7.1 Overview ..... 104
6.7.2 Log ..... 104
6.7.3 Faults and Alarms ..... 107
6.7.3.1 Current Faults ..... 107
6.7.3.2 History Faults ..... 109
6.7.4 Control Panel ..... 109

6.7.4.1 Default Control Panel . . . . . 109
6.7.4.2 Basic Control Panel . . . . . 110
6.7.5 Motor Auto-tuning . . . . . 110
6.8 Device Management . . . . . 114
6.8.1 Overview . . . . . 114
6.8.2 Adding an Object . . . . . 114
6.8.3 Context Menu . . . . . 115
6.9 Function Diagram . . . . . 124
6.9.1 Overview . . . . . 124
6.9.2 Interfaces and Functions . . . . . 124
6.10 Graphical Programming. . . . . 131
6.10.1 Overview . . . . . 131
6.10.2 Interfaces and Functions . . . . . 132
7 Commissioning in Online Mode . . . . . 136
7.1 Connection with Online Device . . . . . 136
7.2 Commissioning through the Control Panel . . . . . 138
8 Operation in Offline Mode . . . . . 142
8.1 Creating an Offline Project . . . . . 142
8.2 Converting an Offline Project to an Online Project . . . . . 149
8.3 Modifying the Offline Project . . . . . 151
8.4 Downloading Parameter Files. . . . . 153
9 User Permission . . . . . 155

# Preface

## Introduction

InoDriveStudio is a commissioning software tool developed for MD880, MD580, and HD3X series and related components such as gateways.

This user guide describes basic functions and provides instructions on online and offline commissioning of the software.

## *Note*

- The drawings in the user guide are shown for illustration only and may be different from the product. Actual products may vary.
- The user guide is subject to change due to product upgrade, specification modification as well as efforts to improve the accuracy and convenience of the guide.

## More documents

| Data name | Data code | Description |
|---|---|---|
| InoDriveStudio User Guide (This guide) | PS00018559 | Presents basic functions, online and offline commissioning of the product. |
| MD880-40 Series Active Rectifier Hardware Guide | 19011311 | Presents technical specifications, components, dimensions, mechanical installation, electrical installation, routine maintenance, and component replacement. |
| MD880 (LC)-40 Series Active Rectifier Function Guide | 19012386 | Presents function applications and troubleshooting of the product. |
| MD880 (LC)-40 Series Active Rectifier Commissioning Guide | 19012387 | Presents the commissioning tool, commissioning process, commissioning procedure, and parameters of the product. |
| MD880 (LC)-40 Series Active Rectifier Parameter Guide | 19012640 | Presents parameters and fault codes of the product. |
| MD880-30 Series Regenerative Rectifier Hardware User Guide | 19011313 | Presents safety instructions, product information, mechanical and electrical installation, and routine maintenance and inspection. |
| MD880-30 Series Regenerative Rectifier Software Guide | 19010689 | Presents commissioning tool, quick commissioning guide, function module description, parameter description, connector resource, and troubleshooting. |

| Data name | Data code | Description |
| --- | --- | --- |
| MD880-20 Series Basic Rectifier Hardware User Guide | 19011491 | Presents technical specifications, components, dimensions, mechanical installation, electrical installation, routine maintenance, and component replacement. |
| MD880 (LC)-20 Series Basic Rectifier Function Guide | 19012538 | Presents function applications and troubleshooting of the product. |
| MD880 (LC)-20 Series Basic Rectifier Commissioning Guide | 19012539 | Presents the commissioning tool, commissioning process, commissioning procedure, and parameters of the product. |
| MD880 (LC)-20 Series Basic Rectifier Parameter Guide | 19012537 | Presents parameters and fault codes of the product. |
| MD880-50 Series Inverter Hardware User Guide | 19010447 | Describes technical specifications, components, dimensions, preparations before installation, unpacking and transportation, mechanical installation, electrical installation, daily maintenance, and component replacement. |
| MD880 Series AC Drive Function Guide (HCU-50S, HCU-51S, HCU-50S-CS, and HCU-51S-CS) | 19012581 | Presents function applications and troubleshooting of the product. |
| MD880 Series AC Drive Commissioning Guide (HCU-50S, HCU-51S, HCU-50S-CS, and HCU-51S-CS) | 19012580 | Presents the commissioning tool, commissioning process, commissioning procedure, and parameters of the product. |
| MD880 Series AC Drive Parameter Guide (HCU-50S, HCU-51S, HCU-50S-CS, and HCU-51S-CS) | 19012699 | Presents parameters and fault codes. |
| SOP-20-880 Smart Operating Panel User Guide | 19010368 | Describes technical data, components, dimensions, installation, wiring, functions, maintenance and so on. |
| MDKE10 Smart Operating Panel User Guide | 19012301 | Presents technical specifications, components, dimensions, mechanical installation, wiring, and routine maintenance. |
| HETN-10 Ethernet Adapter Module User Guide | 19011167 | Presents technical specifications, components, dimensions, mechanical installation, electrical connection, and parameter settings. |

| Data name | Data code | Description |
|---|---|---|
| HCU Control Module User Guide | 19010528 | Presents technical specifications, components, dimensions, mechanical installation, interface circuit, and routine maintenance. |
| HPCU Parallel Control Module User Guide | 19010690 | Presents technical specifications, components, dimensions, mechanical installation, electrical connection, and parameter settings. |
| HPFN-20 PROFINET IRT Industrial Ethernet Adapter Module User Guide | 19011573 | Presents technical specifications, components, dimensions, mechanical installation, electrical connection, and parameter settings. |
| HEIP-10 PROFINET IP Ethernet Adapter Module User Guide | 19012177 | Presents technical specifications, components, dimensions, mechanical installation, electrical connection, and parameter settings. |
| MD880-61 Series Single-phase Braking Unit User Guide | 19011170 | Presents product information, mechanical installation, electrical installation, and routine maintenance. |
| HGW-10 Digital Gateway Commissioning Monitoring Module User Guide | 19011504 | Presents technical specifications, components, dimensions, mechanical installation, electrical connection, and parameter settings. |
| HPG-10 HTL Incremental Encoder Signal Detection Module User Guide | 19010500 | Presents technical specifications, components, dimensions, installation, bus connection, and parameter settings. |
| HPG-50 TTL Incremental Encoder Signal Detection Module User Guide | 19010501 | Presents technical specifications, components, dimensions, mechanical installation, electrical connection, and parameter settings. |
| HPG-40 Resolver Signal Detection Module User Guide | 19010892 | Presents technical specifications, components, dimensions, mechanical installation, electrical connection, and parameter settings. |

## Revision history

| Date | Version | Revision |
|---|---|---|
| March 2025 | A00 | Initial release. |

## Access to the guide

This guide is not delivered with the product. You can obtain the PDF version by the following methods:

- Do keyword search under Service and Support at www.inovance.com.
- Scan the QR code on the product with your smart phone.
- Scan the QR code below to install My Inovance app, where you can search for and download user guides.



## Warranty disclaimer

Inovance provides warranty service within the warranty period (as specified in your order) for faults or damage that occur during normal operation. Maintenance will be charged after the warranty period expires.

Within the warranty period, maintenance fee will be charged for the following damage:

- Damage caused by operations not following the instructions in the user guide
- Damage caused by fire, flood, or unusual voltage
- Damage caused by unintended use of the product
- Damage caused by use beyond the specified scope of application of the product
- Damage or secondary damage caused by force majeure (natural disaster, earthquake, and lightning strike)

The maintenance is charged according to the latest Price List of Inovance. If otherwise agreed upon, the terms and conditions in the agreement shall prevail.

For details, see Product Warranty Card.

# 1 Introduction

This section describes products supported by InoDriveStudio and terms and abbreviations.

## 1.1 Supported Products

InoDriveStudio supports the following drive series:

| Industrial AC drive | Medium voltage AC drive |
|---|---|
| MD580 high-performance engineering AC drive | HD3X Series High-Performance Medium-Voltage AC Drive |
| MD880LC-01S Water-cooled AC drive (single drive system) | |
| MD880-01S Air-cooled AC drive (single drive system) | |
| Extended options of MD880 series products (single drive system) | |
| MD880LC Water-cooled AC drive (multidrive system) | |
| MD880 Air-cooled AC drive (multidrive system) | |
| MD880 Series multi-delivery product expansion module | |
| MD880-DCP Series AC drive dedicated for battery simulators | |

InoDriveStudio software versions:

| InoDriveStudio version | Description |
|---|---|
| InoDriveStudio_AC drive commissioning software (installable version) | The installation package is supported. Install the package before use. |
| InoDriveStudio_AC drive commissioning software (portable version) | Decompress the package to use InoDriveStudio. |

## 1.2 Terms and Abbreviations

| Term | Meaning |
|---|---|
| InoDriveStudio | PC-based commissioning software that is used together with HCU-50S/51S, also called software tool |
| IDS | Abbreviation for InoDriveStudio |
| HCU-50S/51S | High-performance inverter control modules HCU-50S, HCU-51S, HCU-50S-CS, and HCU-51S-CS, which can be used to control MD880-50 series products |
| SOP-20-880 | Smart operating panel for HCU-50S/51S |

| Term | Meaning |
|---|---|
| MDKE10 | Smart operating panel for MD580/MD520 series AC drives (single drive system) |
| HETN-10 | Ethernet commissioning module, mainly used for Ethernet communication on MD880 series AC drives (multidrive system) |
| HPCU | Parallel control module, mainly used for parallel connection on MD880 series products. It supports up to ten paralleled power modules. |
| HGW-10 | Digital gateway commissioning monitoring module, also called gateway Dedicated gateway for data exchange among Ethernet, commissioning network, and data acquisition system. |
| Process data | Generally used to transmit real-time data, that is, one-way transmission without reply required for confirmation |
| Online device | A device that communicates with the IDS on the PC side and keeps the project online and data exchange stable |
| Offline device | A device that is not connected for IDS communication |
| Adaptive baud rate | Baud rate of the connected device automatically matched when the device is scanned by the software |
| AI | Analog input |
| AO | Analog output |
| DI | Digital input |
| DO | Digital output |
| RO | Relay output |
| HDI | High-speed digital input |
| HDO | High-speed digital output |
| OFF1 | Start/stop command, corresponding to bit 0 of control word 1. The rising edge (0->1) corresponds to the start command. When bit 0 is set to 0 (low level), OFF1 is the stop command. |
| OFF2 | Emergency stop command, corresponding to bit 1 of control word 1. The emergency stop command takes effect immediately in any state. Operation is allowed at high level and IGBT output is prohibited at low level. |
| OFF3 | Fast stop command, corresponding to bit 2 of control word 1. The fast stop command takes effect immediately in any state. Operation is allowed at high level. At low level, the device decelerates to zero speed according to the OFF3 stop time and then the IGBT output is prohibited. |
| Operation enable | Corresponds to bit 3 of control word 1. Whether to enable the operation is determined after the OFF1 start command is valid. At high level, the device is allowed to enter the operation state and IGBT output is enabled. At low level, the device maintains operation-ready and IGBT output is prohibited. |

| Term | Meaning |
| --- | --- |
| Connector | A special read-only parameter that records data during operation of the HCU-50S/51S The value can be read by a given source parameter or the waveform change of the data can be recorded by an oscilloscope. |
| Bit connector | It is a connector parameter that records one piece of bit data. The values are 0 and 1 |
| B connector | Bit connector |
| Word connector | It is a connector parameter that records one piece of analog data. |
| Single word connector | 16-bit data-type connector parameters |
| Double word connector | 32-bit data-type connector parameters |
| K connector | Word connectors can be classified into single word connectors and double word connectors. |

# 2 Descriptions of InoDriveStudio

This chapter describes the functions, operating environment, and system requirements of the software.

## 2.1 About InoDriveStudio

InoDriveStudio is a commissioning software product independently developed by Inovance Technology Co., Ltd. for host controllers of MD880, MD580, and HD3X series drives. It adopts a compact and intuitive operating interface design and provides multiple powerful functions.

InoDriveStudio has the following features, including:

- Multiple communication protocols: It supports communication protocols such as USB and Ethernet, making connection modes more flexible for users. For example, the Ethernet can be implemented through gateway or various expansion cards.
- Highly flexible modular design: Software and hardware modules can be matched freely and cater to customization without changing parameters, enhancing software flexibility and extendability.
- Easy commissioning in various ways: It allows quick on-site troubleshooting, fault level self diagnosis, and on-site data analysis and remote diagnostic in real time, greatly improving commissioning efficiency and accuracy.

## 2.2 Major Functions

The current version supports the following: parameter list, parameter monitoring, parameter setting wizard, oscilloscope, trigger oscilloscope, log analysis, black box, fault alarm, motor auto-tuning, control panel, function diagram, and graphical programming.

## 2.3 System Requirements

- Hardware configuration

| Configuration item | Recommended configuration | Minimum configuration |
|---|---|---|
| CPU | Core i5/R5 and above | Core i3 650 |
| RAM | 4 GB and above | 512 MB |
| Hardware | 512 MB, at least 250 MB available | 245 MB, at least 115 MB available |
| Display | Resolution of 1920×1080 pixels or higher, 32-bit color | Resolution of 800×600 pixels or higher, 256-bit color |
| Operating system | Windows XP Professional, Windows 7, Windows 10, Windows11 | Windows XP Professional, Windows 7 |

- Software configuration

The InoDriveStudio supports only Windows operating systems, including but not limited to those listed as follows:

Operating systems of full version: Windows XP Professional, Windows 7, Windows 8, Windows 10, Windows 11

## 2.4 Technical Support

The Inovance technical service hotline fully serves you with technical advice, feedback, factory repair and on-site maintenance services. Stay responsive for quality service!

Customer service hotline: 4000-300124

A total of 8 lines for 400 business structures, including:

- Key 1: AC drive consulting
- Key 2: Servo product consulting
- Key 3: PLC and HMI product consulting
- Key 4: Elevator product consulting
- Key 8: Business consulting
- Key 9: About Inovance
- Key 0: Other problems and complaints

Technical website: *http://www.inovance.com*

Shenzhen Inovance Technology Co., Ltd.

Add.: No. 52, Tian E Dang Road, Wuzhong District, Suzhou 215104, P.R. China

# 3 Installating and Uninstalling InoDriveStudio

This section gives instructions on how to install and uninstall the software.

## 3.1 Installing the Software

Type “InoDriveStudio”under **Service and Support** at Inovance official website (http://www.inovance.com) to download the latest official version of InoDriveStudio. There are two versions of InoDriveStudio, as shown in the following figure.

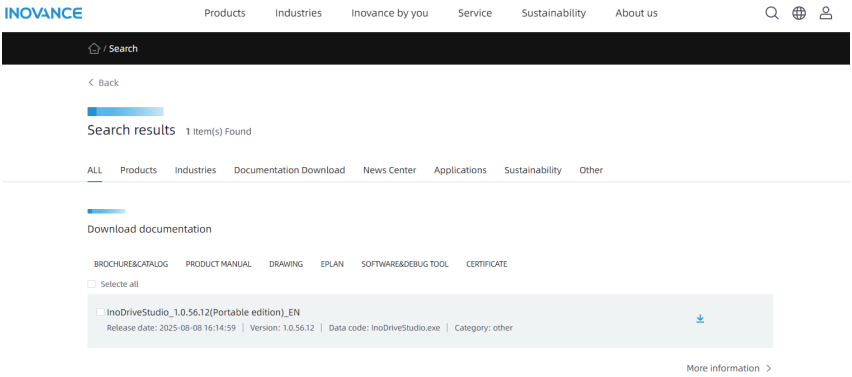



Figure 3-1 InoDriveStudio official versions

The installable and portable package files of the same version only differ in the installation mode slightly, as described in the following:

- To install an installable version, you need to uninstall the previous version from the computer first. Only one installable version is allowed for each computer. For portable versions, however, the preceding procedure is not required.
- After the installable version is installed, open the app through the menu bar or desktop shortcut. For a portable version, open the .exe file in the installation path to run it.

### 3.1.1 Authorized Installation

If the installable or portable version is installed for the first time, double-click InoDriveStudio.exe to display the authorized installation interface. The authorization level is “Senior” by default, which supports all functions. Click “Installation authorization code” to complete the installation. For details on other authorization levels for installation, see *" User Permission" on page 155*.




Figure 3-2 Authorized installation

### 3.1.2 Installing the Installable Version

1. Download the installable version to the PC. Then, unzip the downloaded file with 7-Zip and double-click it, as shown in the following figure. After reading the end user license agreement carefully, click “I accept the agreement” and “Next”.

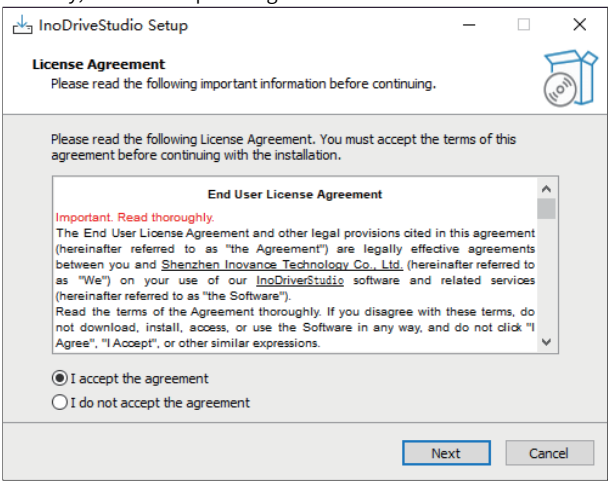



Figure 3-3 License agreement

2. After reading the privacy policy, click "Accept", as shown in the following figure.

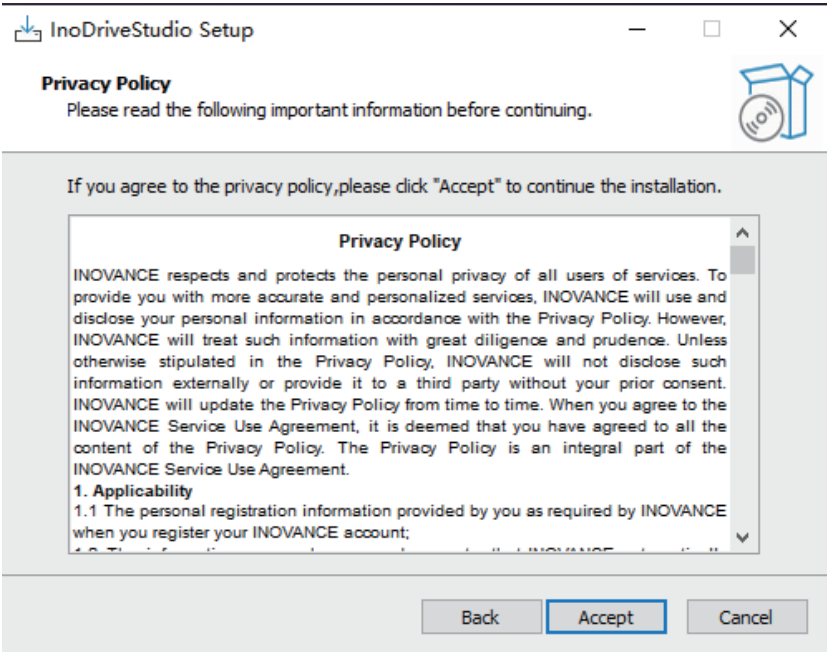



Figure 3-4 Privacy policy

3. The software is installed into a folder in the C drive. You can click “Browse” to select a different folder as needed. Then, click “Next”, as shown in the following figure.

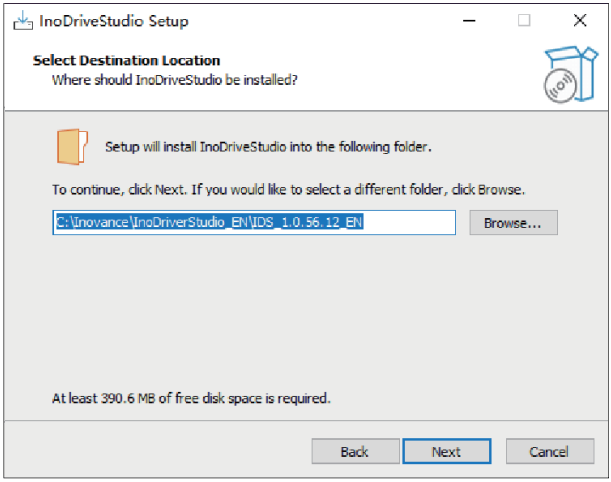



Figure 3-5 Selecting destination location

4. Select the additional tasks to be performed, as shown in the following figure. A desktop shortcut is created by default, which can be canceled as needed, as shown in the following figure.

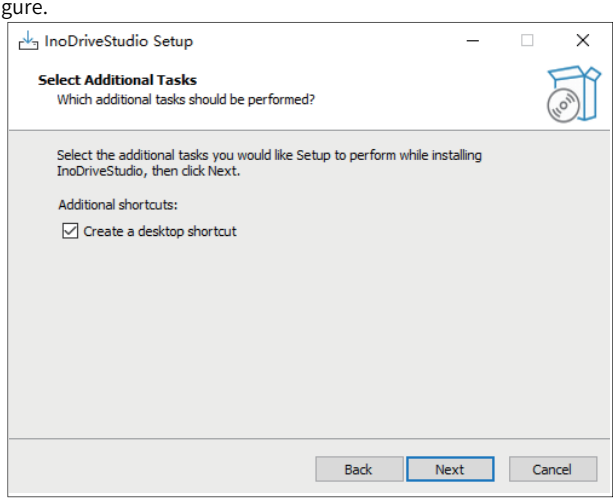



Figure 3-6 Selecting additional tasks

5. Check the settings again, and click “Install” to begin the installation, as shown in the following figure.

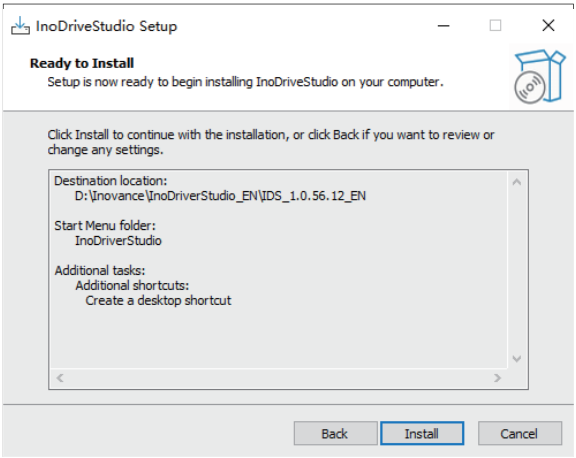



Figure 3-7 Ready to install

6. After InoDriveStudio is installed successfully, the following interface appears.

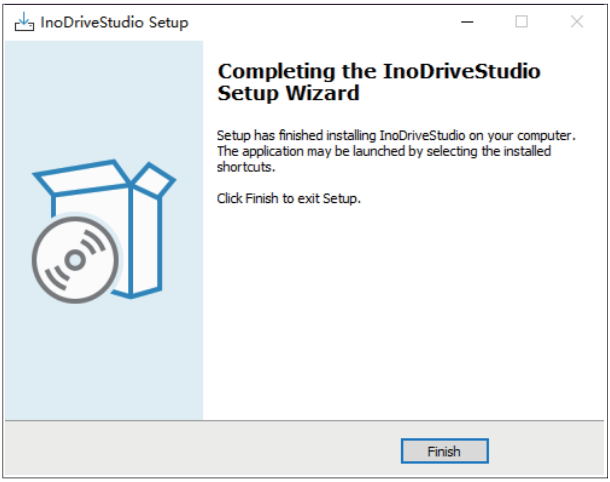



Figure 3-8 Installation completed

### 3.1.3 Installing the Portable Version

Download the portable version from the official website. Unzip and access the downloaded file, as shown in the following figure. Double-click the exe. file.

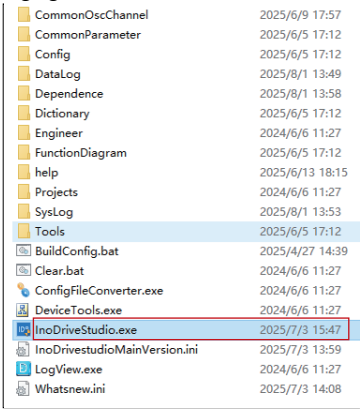



Figure 3-9 Software directory

## 3.2 Uninstalling the Software

Disable the software and related services before uninstalling InoDriveStudio. The following takes Windows 10 as an example to uninstall the software.

### 3.2.1 Uninstalling the Installable Version

- Method 1:

  1. Choose and right-click InoDriveStudio icon on the desktop, as shown in the following figure. Then, select “Open file location”.

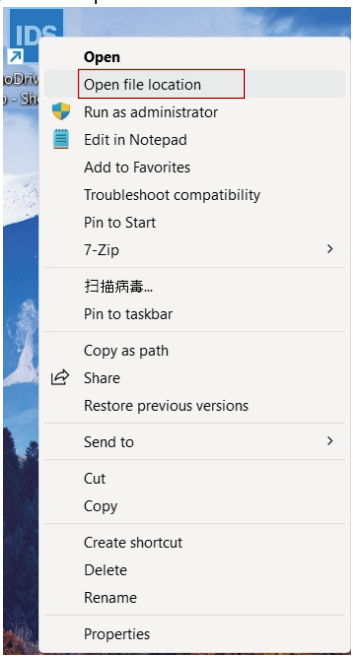



Figure 3-10 Shortcut menu

  2. Go to the installation directory of the software, as shown in the following figure. Then, click “unins000.exe” to uninstall the version.

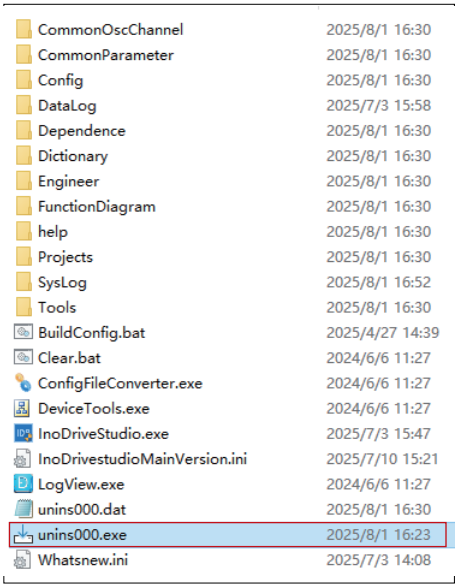



Figure 3-11 Software installation directory

- Method 2: For Windows 10, go to “Control Panel > Programs > Programs and Features” and right-click InoDriveStudio to uninstall the version.

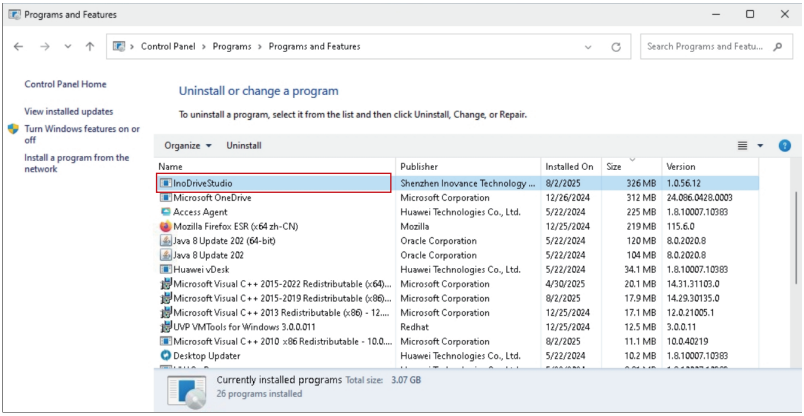



Figure 3-12 Uninstalling the program

### 3.2.2 Uninstalling the Portable Version

Select all files in the software directory. Right-click and select “Delete” in the shortcut menu to uninstall the portable version, as shown in the following figure.

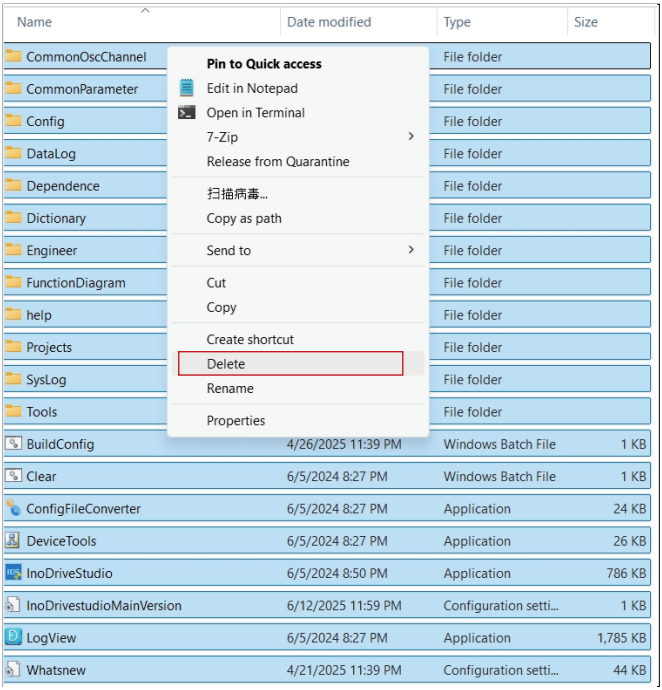



Figure 3-13 Uninstalling the software

# 4 User Interface

This chapter describes the start page and functions displayed after the software is enabled.

## 4.1 Main Interface

Double-click the icon to open InoDriveStudio. The following interface appears.

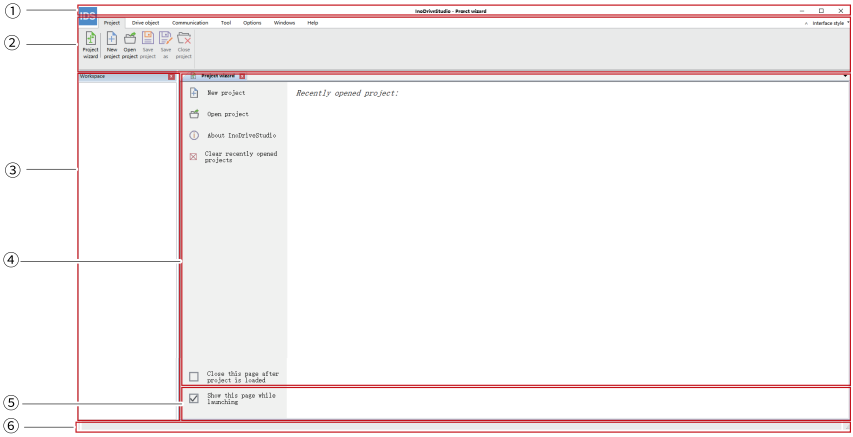



Figure 4-1 Main interface

Table 4–1 Areas of main interface

| No. | Name | Description |
|---|---|---|
| ① | Title bar | Displays information such as window titles or files that are open. |
| ② | Menu bar | Displays each functional module. |
| ③ | Workspace | Displays navigation information such as the current project. |
| ④ | Main workspace | Displays details of an item specified in the navigation pane. Multiple sub-workspaces can be placed in the main workspace. |
| ⑤ | Multi-functional area | Displays the log pane, monitoring pane, control panel pane, fault pane, etc. |
| ⑥ | Status bar | Displays the current project status. |

## 4.2 Menu Bar

### 4.2.1 Project

The following figure shows the interface when “Project” is selected in the toolbar.

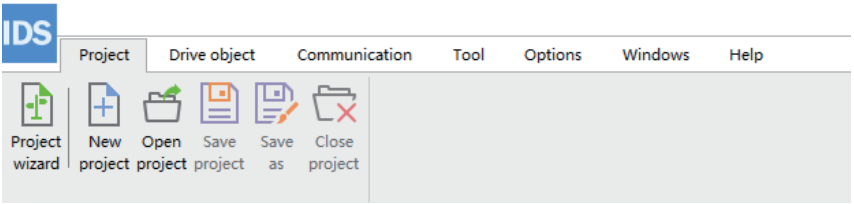



Figure 4-2 Toolbar

#### 4.2.1.1 Project Wizard

The project wizard interface is displayed by default. For details, see *"4.4 Project Wizard" on page 38*.

#### 4.2.1.2 Creating a Project

Click “New project”.

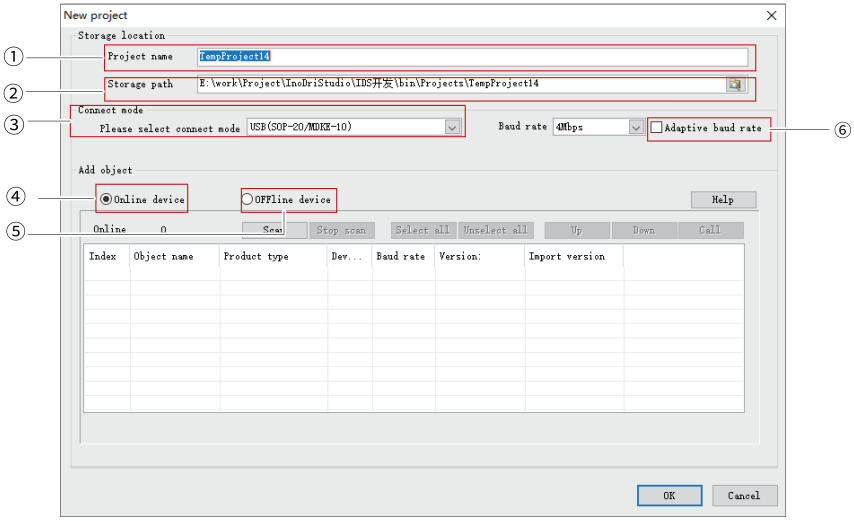



Figure 4-3 Creating a project

Table 4–2 Configuration items for new project

| No. | Name | Description |
|---|---|---|
| ① | Project name | Specifies the name of the project to be created. |
| ② | Storage path | Specifies the path where the new project is saved. |
| ③ | Connection mode | Specifies the communication method and related parameters for the project to be created. Currently, communication methods including USB, TCPIP(HETN-10/HPCU/HPFN-20/HEIP-10), and TCP/IP(HGW-10) are supported. After a project is loaded, you can go to Communication > Communication settings to change the connection method. The InoDriveStudio will connect to the device using the set connection method. |
| ④ | Online device | Specifies the online device to be added to the project that is created. The online device can be displayed by scanning. |
| ⑤ | Offline device | Specifies the offline device to be added to the project that will be created. The offline device can be determined by information such as product type and version. |
| ⑥ | Adaptive baud rate | When selecting the USB communication method, you can select or clear the option to determine whether to scan the device with an adaptive baud rate. If the option is selected, devices whose baud rates are supported will be scanned; otherwise, only devices whose baud rate is the specified baud rate will be scanned. |

## *Note*

- When multiple devices are cascaded, ensure that the communication addresses of the devices are unique and the communication baud rates of the devices are consistent. Set the communication address through A10-03 and communication rate through A10-04.
- When multiple devices are cascaded, ensure that the device names are unique. Otherwise, the new project cannot be created.

1. Adding an online device

- In the following figure, USB connection is selected.

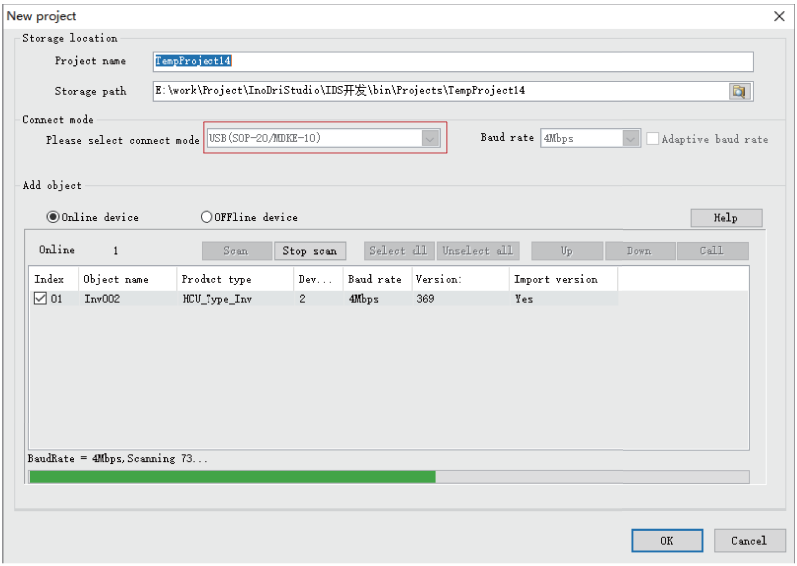



Figure 4-4 Scanning when USB(SOP-20/MDKE-10) connection is selected

Table 4–3 Items scanned for connection mode

| Name | Description |
|---|---|
| Index | Multiple devices can be scanned at the same time. You can check the box to select a scanned device for the new project. |
| Object name | Indicates the device name, which can be modified. |
| Product type | Indicates the product type. |
| Device address | Specifies the 485 network station number of the offline device to be added. The device address can be modified but must be unique. |
| Baud rate | Specifies the 485 network baud rate of all devices in the current project. All devices in the project must use the same baud rate. |
| Version | Version |
| Import version | If the version has been imported, select “No”. Otherwise, select “Yes”. You can also select “Yes” to import the version again. |

- If TCP/IP (HENT-10/HPCU) is selected, the TCP/IP connection mode is implemented based on the HETN-10 module.

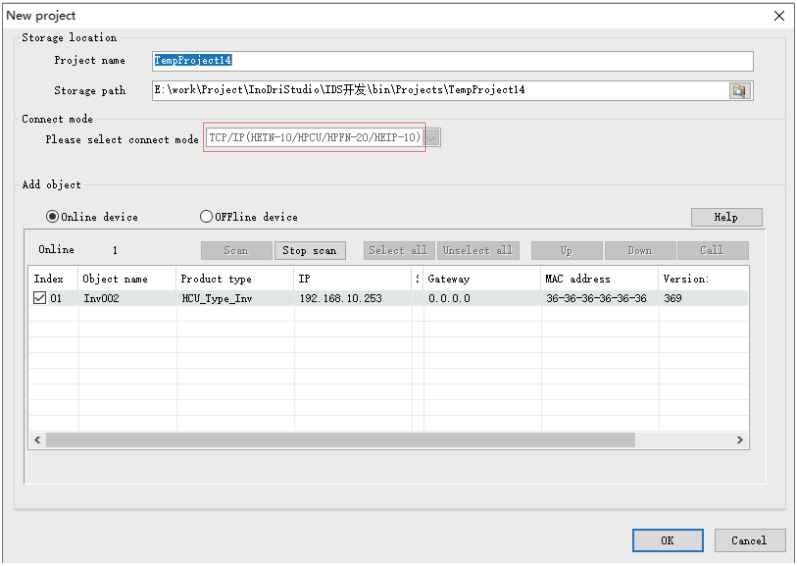



Figure 4-5 Scanning when TCP/IP (HENT-10/HPCU) connection is selected

- If TCP/IP(HGW-10) is selected, the Ethernet connection of multiple HCU controllers is implemented based on the gateway.

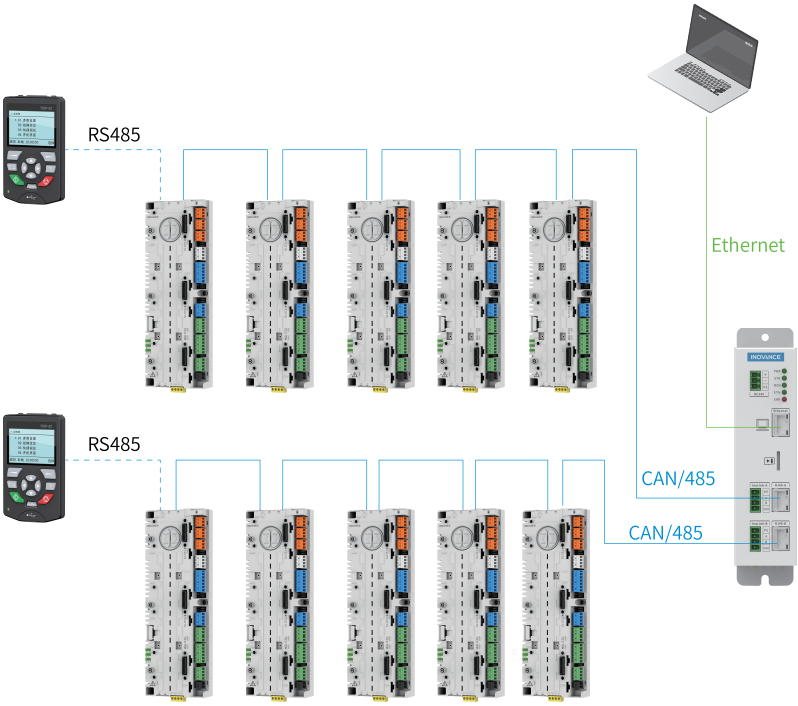



Figure 4-6 Ethernet connection topology based on HGW-10

You can use HGW-10 to convert Ethernet communication to 485 network for HCU connection. Each port of an HGW-10 supports up to 32 HCU controllers cascaded. Select corresponding connection modes TCP/IP (HGW-10) when creating the project.

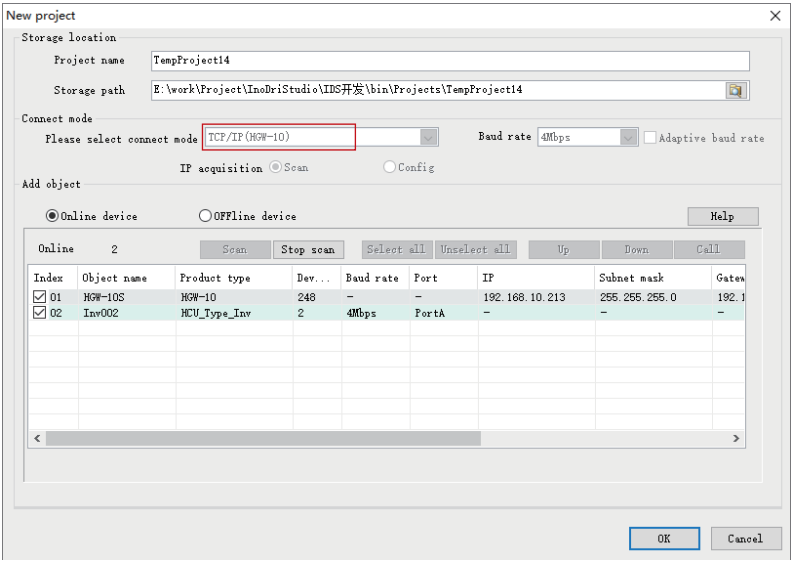



Figure 4-7 Scanning when TCP/IP(HGW-10) connection is selected

As there are multiple gateways on the Ethernet network, when the IP is obtained through scanning, an excessive number of devices may be scanned. It is recommended to scan via configuration. After you click “Config”, the IP configuration dialog box automatically pops up. You can add up to ten HGW-10 IP addresses manually. You can also click “Config” to open the configuration dialog box. After you configure an IP, click “Scan” to display all devices under that IP in the list.

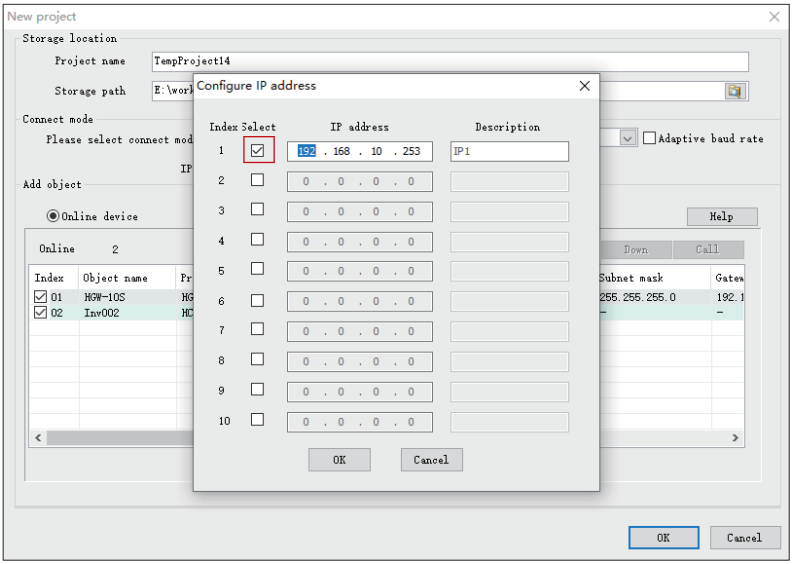



Figure 4-8 Manually configuring the IP dialog box

When the check button is not checked, the IP address will not be scanned.

2. Adding an offline device

- Add USB (SOP-20/MDKE-10) offline device.

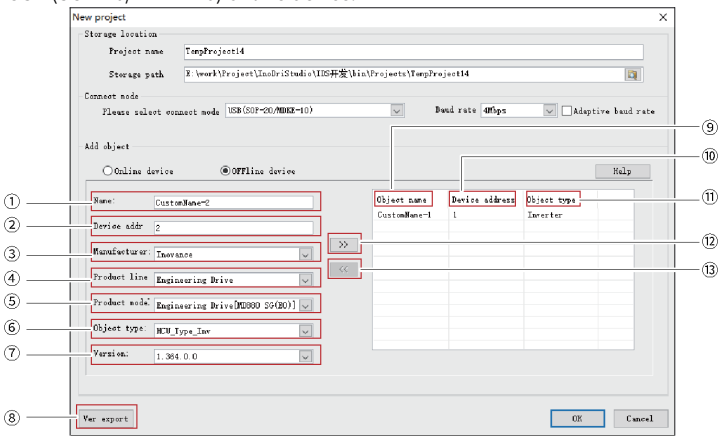



Figure 4-9 New project for offline device

Table 4–4 Items for adding an offline device

| No. | Name | Description |
|---|---|---|
| ① | Name | Indicates the name of the device. The device names in the project can be modified but shall not be the same. |
| ② | Device address | Indicates the station number of the device, which can be modified. |
| ③ | Manufacturer | Specifies the name of the offline device manufacturer. Currently, only Inovance is used. |
| ④ | Production line | Specifies the product line to which the offline device to be added belongs. The product lines include engineering drives and high voltage drives. |
| ⑤ | Product mode | Specifies the product mode of the offline device to be added. The product modes include MD880 series, MD580 series, and gateway. |
| ⑥ | Object type | Specifies the object type of the offline device to be added. For example, inverter, rectifier, DC-DC, and so on. |
| ⑦ | Version | Indicates the parameter version to be added. |
| ⑧ | Version export | All product series and versions supported are exported in excels. |
| ⑨ | Object name | Indicates the name of the device to be added, which can be modified before adding the device. |
| ⑩ | Device address | Indicates the station number of the device to be added, which can be modified before adding the device. |
| ⑪ | Object type | Specifies the object type of the device to be added, which cannot be modified. |
| ⑫ | Add | Add a device to the list. |
| ⑬ | Delete | Delete a device from the list. |

- Add an offline device for TCP/IP (HETN/HGW-10) connection.

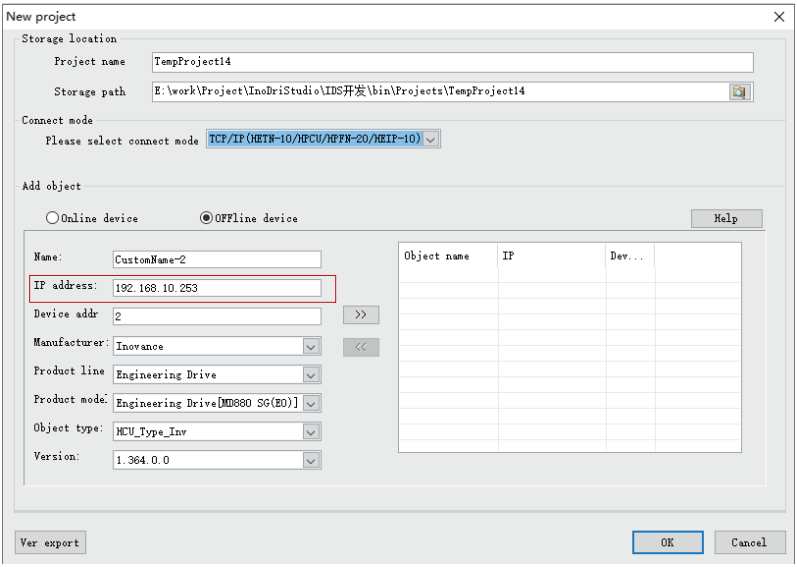



Figure 4-10 Adding an offline device for TCP/IP connection

Table 4–5 Descriptions of offline device IP address

| Name | Description |
|---|---|
| IP address | Specifies the IP address of the HETN-10 module of the offline device to be added. |

#### 4.2.1.3 Opening the Project

Open the project file with the suffix .inopro, as shown in the following figure.

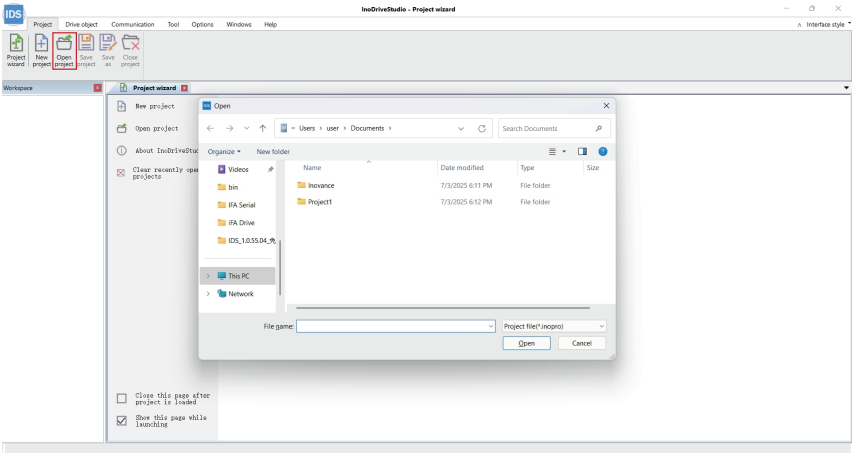


Figure 4-11 Opening the project

### 4.2.1.4 Saving the Project

Save the currently opened project, parameter files, and configuration files.

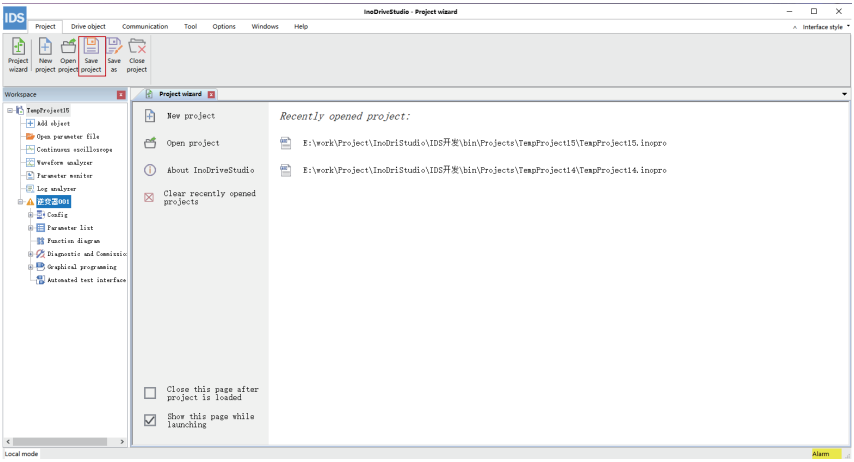


Figure 4-12 Saving the project

### 4.2.1.5 Saving the Project as

Save the project as a file of another name. You can modify the saved project name.

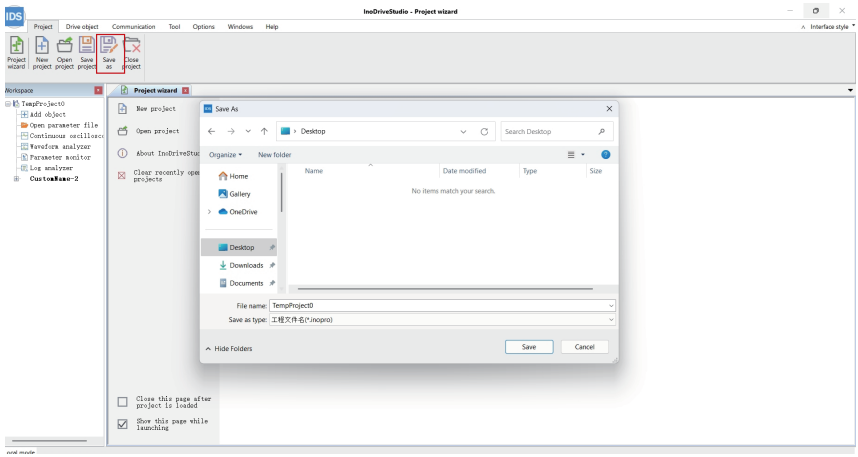



Figure 4-13 Saving the project as

### 4.2.1.6 Closing the project

Close the opened project. The project is automatically saved before it is closed.

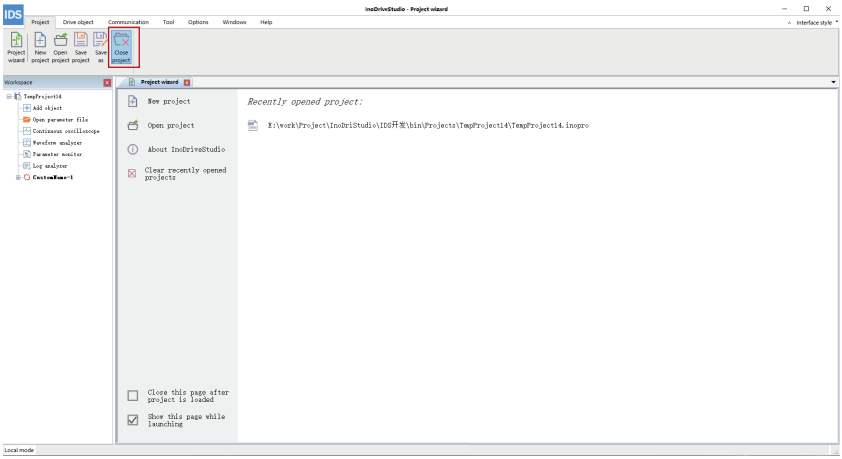



Figure 4-14 Closing the project

## 4.2.2 Drive Object

For functions of “Drive Object” in the toolbar, see the following figure.




Figure 4-15 Drive object

Table 4–6 Options in the **Drive Object** toolbar

| No. | Name | Description |
|---|---|---|
| ① | Compare | For details on parameter comparison, see the following comparison table |
| ② | Paste | Right-click on the device pane and select “Copy”, as shown in the following figure. Then, select “Paste” to quickly copy a device. |
| ③ | Delete | Select the device and click “Delete” to quickly delete the device. |

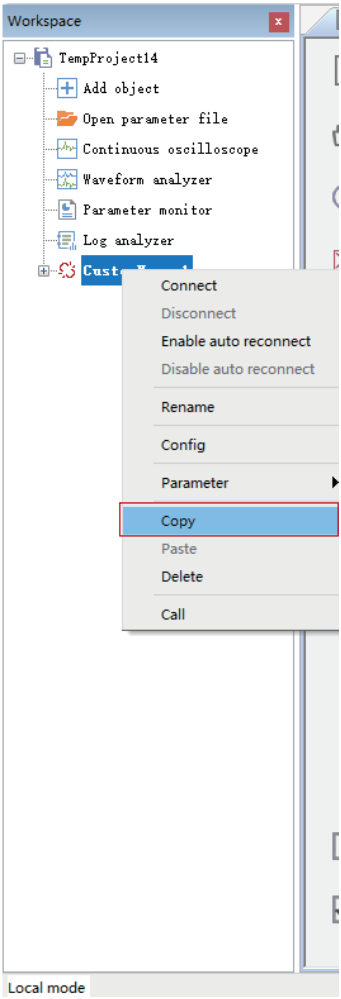



Figure 4-16 Device copy function

### 4.2.3 Communication

The following figure shows the “Communication” toolbar.



Figure 4-17 Communication settings

Table 4–7 Options in the **Communication** toolbar

| No. | Name | Description |
|---|---|---|
| ① | Communication settings | You can modify the baud rate when the device is offline. |
| ② | Connect | The device can be quickly connected when it is offline. |
| ③ | Disconnect | The device can be quickly disconnected when it is online. |

## 4.2.4 Options

The following figure shows Options in the toolbar.

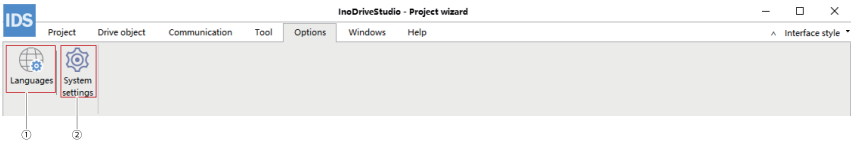



Figure 4-18 Options in the toolbar

Table 4–8 Descriptions of options

| No. | Name | Description |
|---|---|---|
| ① | Languages | Language settings are not available. Download other language versions from the official website as necessary. |
| ② | System settings | Configure “Parameter upload”, “Parameter download”, “Save parameter as”, “Save project as” as the four paths supported for each setting.<br>Last record: Indicates the path last used.<br>Project path: Indicates the project path in the software directory.<br>Engineering path: Indicates the engineering path in the software directory.<br>Custom: Indicates the user-defined path. |

## 4.2.5 Windows

The following figure shows the Windows toolbar.

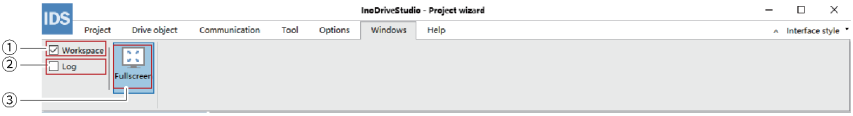



Figure 4-19 Windows

Table 4–9 Options in the **Windows** toolbar

| No. | Name | Description |
|---|---|---|
| ① | Workspace | Used to set whether to display the workspace.<br>• Checked: The workspace is displayed.<br>• Unchecked: The workspace is not displayed. |
| ② | Log | User operations and some business logs are displayed in the multi-functional area. The logs aim to facilitate software troubleshooting and shall not be considered as the data log of the slave. |
| ③ | Full screen | Full screen |

## 4.2.6 Help

The following figure shows the **Help** toolbar.

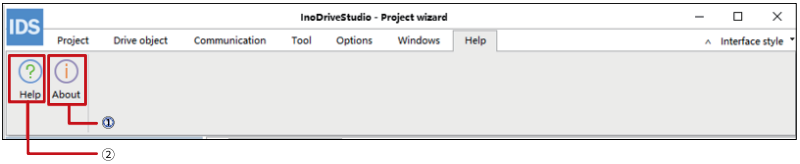



Figure 4-20 Help

Table 4–10 Option**s in the Help** toolbar

| No. | Name | Description |
|---|---|---|
| ① | Help | Used to quickly access the help document. |
| ② | About | Displays the current version number, machine internal code, release date, and version history information. |

## 4.2.7 Interface Style

The following figure shows the Interface Style toolbar.

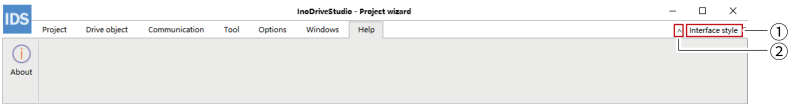



Figure 4-21 Interface style

Table 4–11 Options in the **Interface Style** toolbar

| No. | Name | Description |
|---|---|---|
| ① | Interface style | You can customize the interface style. Currently, styles of Windows7, Windows XP, and Visual Studio 8 are supported. |
| ② | Min./Max. toolbar | The toolbar can be minimized or maximized. |

## 4.3 Workspace

Open or create a project, as shown in the following figure.

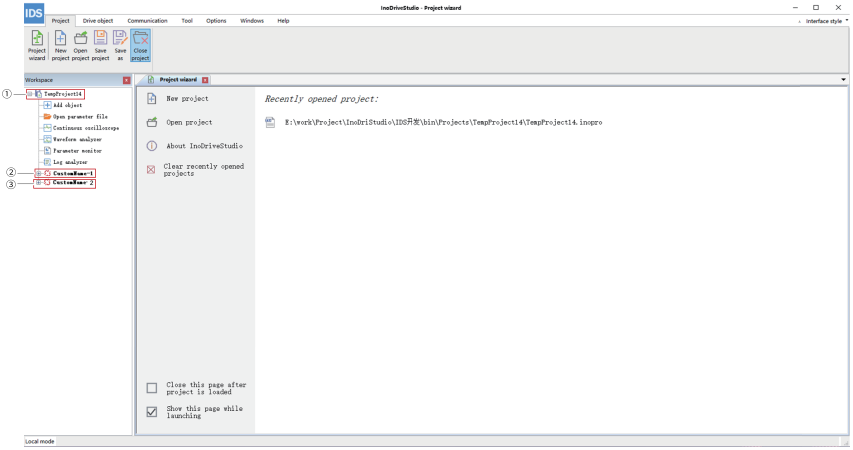



Figure 4-22 Workspace interface

Table 4–12 Major items in the **Workspace**

| No. | Name | Description |
|---|---|---|
| ① | Project name | Indicates the name of the currently opened project. You can only open or create one project at a time. |
| ② | Device name 1 | Indicates the name of the device.<br>• Offline: flashes in red.<br>• Online: flashes in green.<br>• Alarm: flashes in red.<br>• Alarm: flashes in yellow. |
| ③ | Device name 2 | Indicates the name of the device. You can attach multiple devices to one project. Each device name must be unique. |

## 4.4 Project Wizard

The following figure shows the project wizard interface.

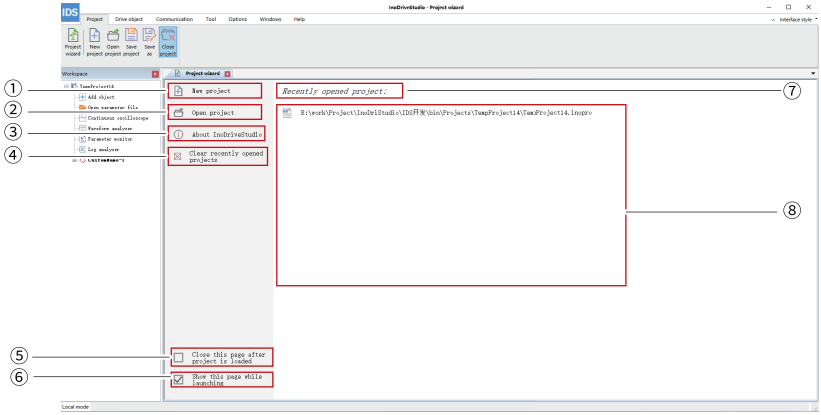



Figure 4-23 Homepage of new project

Table 4–13 Items in the New Project homepage

| No. | Name | Description |
|---|---|---|
| ① | New project | Click “New project” to create a project in the displayed dialog box. |
| ② | Open project | Click “Open project” to open a wanted project. |
| ③ | About InoDriveStudio | Click About InoDrive Studio to view information about the current InoDriveStudio version. |
| ④ | Clear recently opened projects | If the option is selected, all recently opened projects are cleared. You can check it to delete all recently opened projects. |
| ⑤ | Close this page after project is loaded | If the option is selected, the project wizard is automatically closed when the project is loaded. If the option is cleared, the project wizard is not automatically closed when the project is loaded. |
| ⑥ | Show this page while launching | If the option is selected, the project wizard will open automatically when the software is started. If the option is cleared, the project wizard will not open automatically when the software is started. You can go to Project > Project wizard to open this page. |

| No. | Name | Description |
|---|---|---|
| ⑦ | Recently opened project | You can view the eight recently opened projects. |
| ⑧ | Path name of recently opened project | The path names of the recently opened projects are displayed in the descending order of time. Double-click a file name to open the specified recent project. Move your cursor over the file name. The file name will be highlighted in light blue, and  is displayed. Click the icon to hide the project from the recently opened project list. |

## 4.5 Multi-function Area

The multi-function area displays the log, parameter monitoring table, fault alarm table, and control panel, as shown in the following figure.

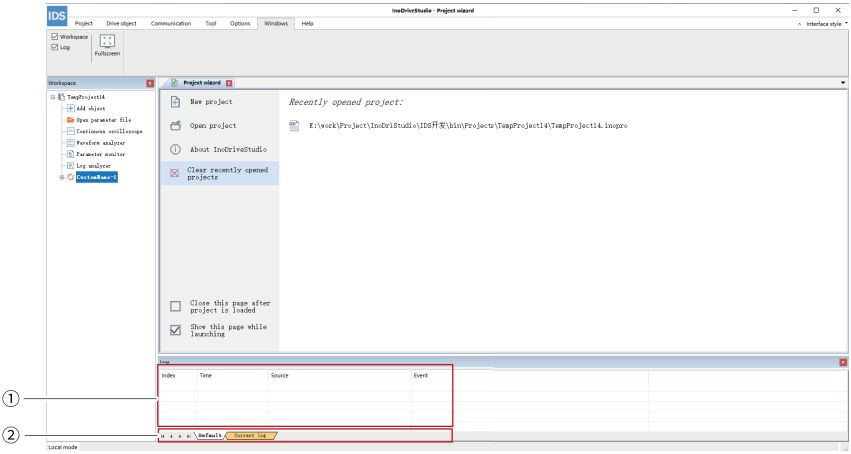



Figure 4-24 Multi-function area

Table 4–14 Descriptions of multi-function area

| No. | Name | Description |
|---|---|---|
| ① | Multi-function main page | Label interface activated through mouse |
| ② | Function label | Multiple function labels. You can drag the page or the label name to change the position through the left mouse button, as shown in the following figure. |

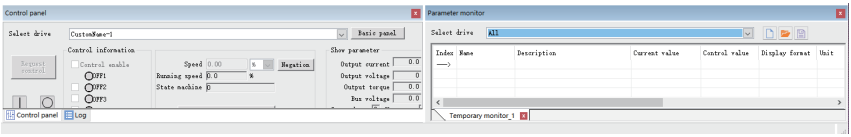


Figure 4-25 Split screen view of multi-function area

## 4.6 Status Bar

The following figure shows the status bar.

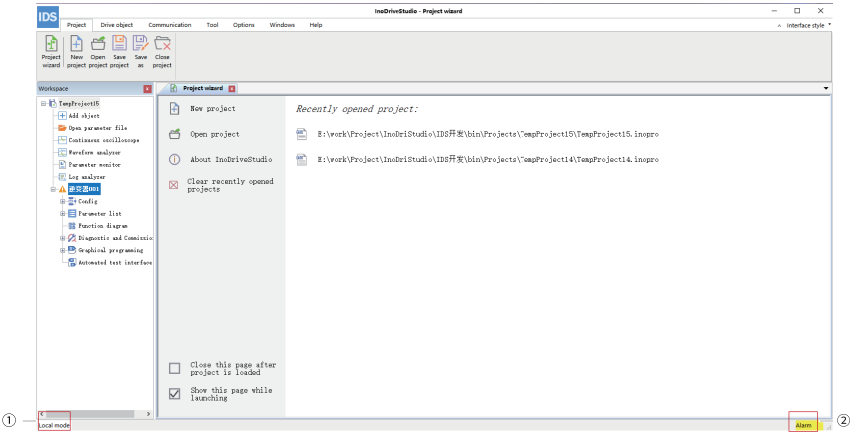


Figure 4-26 Areas of status bar

Table 4–15 Areas of status bar

| No. | Name | Description |
|---|---|---|
| ① | Commissioning mode | Local mode: The device is connected to the software directly or through LAN.<br>Remote mode: The device is connected to the software through IoT. |
| ② | Alarm | The status include normal, fault, minor fault, alarm, and offline. Blank space is displayed in offline status. |

# 5 Connect

This chapter describes how to connect InoDriveStudio and HCU. Only after the connection is established, you can proceed with the commissioning. Specific connection modes include USB (SOP-20-880/MDKE10), TCP/IP (HETN-10/HPCU), TCP/IP (HGW-10), and TCP/IP (HPFN-20/HEIP-10).

## 5.1 USB(SOP-20-880/MDKE10)

### 5.1.1 Overview

The following devices are supported in the USB connection mode.

| Device | Connection mode | Related document |
|---|---|---|
| SOP-20-880 | Direct connection with PC or relay connection is supported. When the SOP-20-880 is connected to PC directly, all information is displayed on the operating panel. To use relay connection, select “USB relay mode” on the operating panel. | SOP-20-880 Smart Operating Panel User Guide |
| MDKE10 | Direct connection with the PC is supported. If MDKE-10 is not connected to PC, the information is displayed on the operating panel. Otherwise, the operating panel displays "USB" mode in which the software is connected to the AC drive. | MDKE10 Series Smart Operating Panel User Guide |

SOP-20-880 has a wide power supply range and LCD display. It applies to the single-motor/ multi-motor drive system and provides such functions as parameter setting, state monitoring, parameter copy, fault analysis, program download, USB relay, and mass storage.

## 5.1.2 Keys and Display

### Descriptions of keys

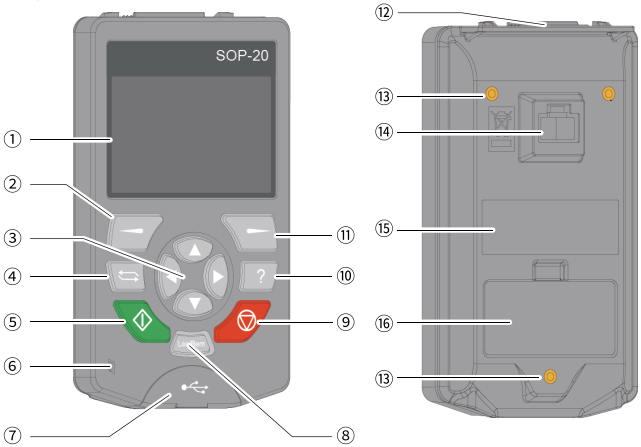



Figure 5-1 Appearance and keys of SOP-20-880

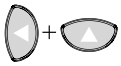
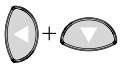
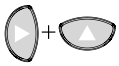
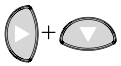
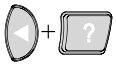
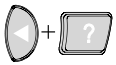
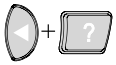
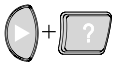
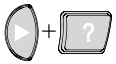
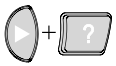
Table 5–1 Components of SOP-20-880

| No. | Name |
|---|---|
| ① | Display |
| ② | Left soft key |
| ③ | Direction key |
| ④ | SHIFT key |
| ⑤ | Operation key |
| ⑥ | Status indicator |
| ⑦ | USB port |
| ⑧ | Loc/Rem key |
| ⑨ | Stop/Reset key |
| ⑩ | Help key |
| ⑪ | Right soft key |
| ⑫ | Snap-fit joint |
| ⑬ | Fixing screw |
| ⑭ | RJ45 interface |
| ⑮ | Nameplate |
| ⑯ | Battery cover |

Table 5–2 Descriptions of keys

| Key | Name | Description |
|---|---|---|
|  | Left soft key | Used for exit or cancellation purpose.<br>The soft key at the lower left corner on the display features difference functions in different interfaces. For example, this key on the homepage is used to enter the device selection page. |
|  | Right soft key | Enter or confirm<br>The soft key at the lower right corner on the display features different functions in different interfaces. For example, this key on the homepage is used to enter the menu interface. |
|  | SHIFT key | Used to quickly enter the device list.<br>In interfaces that do not allow operations to be interrupted, the device shift function is inhibited. In this case, the shift key is inactive. |
|  | Help key | Used to open the help page.<br>A help interface varies with the context (such as the current menu or view). |
|  | Operation key | Used to start the equipment in the local control mode. |
|  | Stop/Reset key | Used to stop the equipment in the local control mode. When the device is in the fault state, use this key to reset the fault. |
|  | Loc/Rem key | Used to switch the control permission of the device.<br>Local: The device start/stop is controlled by SOP-20-880 (local control).<br>Remote: The device start/stop is controlled by the parameters and functions of the device. |
|  | Direction key | The up and down arrow keys are used to select options in a menu or list, scroll up and down a text page, and adjust a value (such as setting time, inputting a password or changing a parameter value). The left and right keys are used to move the cursor left and right. |

Table 5–3 Descriptions of shortcut keys

| Shortcut key | State illustrated | Available in | Function |
|---|---|---|---|
| Left+Up |  | Any view | Adjusts the backlight brightness. |
| Left+Down |  | | |
| Right+Up |  | Any view | Adjusts the contrast ratio. |
| Right+Down |  | | |
| Left+Help |  | Parameter list view | Adds the parameter where the cursor is directed at to the shortcut interface. |
| Left+Help |  | Shortcut view | Deletes the parameter from the shortcut interface. |
| Left+Help |  | Startup interface view | Deletes the parameter from the startup interface. |
| Right+Help |  | Parameter list view | Adds the parameter where the cursor is directed at to the startup interface. |
| Right+Help |  | Shortcut view | Deletes all the parameters from the shortcut interface. |
| Right+Help |  | Startup interface view | Clears all parameters from the startup interface. |

## Homepage

SOP-20-880 adopts the monocolour LCD with white backlight and a resolution of 240x160 pixels.

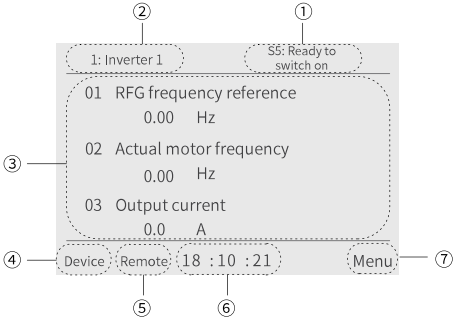



Figure 5-2 Homepage

Table 5–4 Descriptions of the homepage

| No. | Display | Description |
|---|---|---|
| ① | Device status and fault information | Displays information about the operating status of the device, including the state machine, fault, and alarm. When a fault occurs on the device, the fault information and operating status are displayed alternately. |
| ② | Current device information | 1: Current device station number<br>Inverter 1: Current device name |
| ③ | Content | Real-time display of monitored information |
| ④ | Device list | Used to display the device list of the current network. |
| ⑤ | Local/Remote | Local: The device is controlled by SOP-20-880 (local control).<br>Remote: The device is controlled by I/O or bus (remote control).<br>Blank: This function is unavailable on the equipment. |
| ⑥ | SOP-20-880 time | Displays the clock time in SOP-20-880. |
| ⑦ | Menu | Used to access the function menu of current device. |

## Status indicator

The status indicators on SOP-20-880 are used to indicate whether a fault or alarm exists.

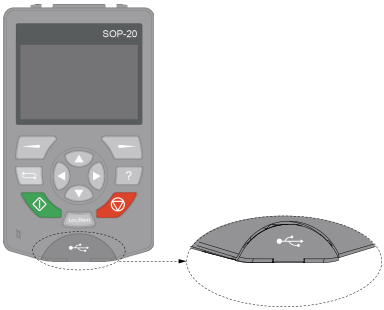
Table 5–5 Descriptions of status indicators

| Symptom | Example | Meaning |
|---|---|---|
| Steady green |  | The device is running properly. |
| Flashing green |  | The data is being transferred between SOP-20-880 and PC with USB. |
| Steady red |  | Communication between SOP-20-880 and the equipment is normal, but the equipment is faulty. |
| Flashing red |  | Communication between SOP-20-880 and the equipment is interrupted. |

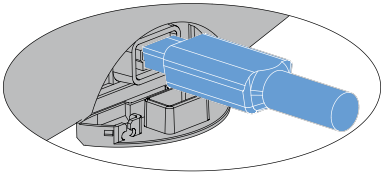
### 5.1.3 Connecting the Relay to PC

The B-type mini USB terminal on the lower part of SOP-20-880 is used to connect to PC. The connection cable shall not exceed 3 m. The USB2.0 communication protocol is used between the SOP-20-880 and the PC.

1. Open the USB terminal cover.

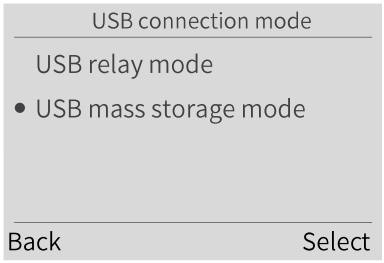



2. Insert the USB cable and connect the cable with ferrite core (recommended) to the PC.



3. After the SOP-20-880 is connected to the PC, you will be prompted to choose the USB relay mode or USB mass storage mode.

- When "USB relay mode" is selected, the SOP-20-880 can be used as a relay to enable communication between the device and the PC. To perform commissioning with InoDriveStudio, select "USB relay mode".
- In the “USB mass storage mode”, the SOP-20-880 can be used as a memory.




## *Note*

For details, see *SOP-20-880 Smart Operating Panel User Guide*.

For InoDriveStudio software configuration, click New project to display the following page.

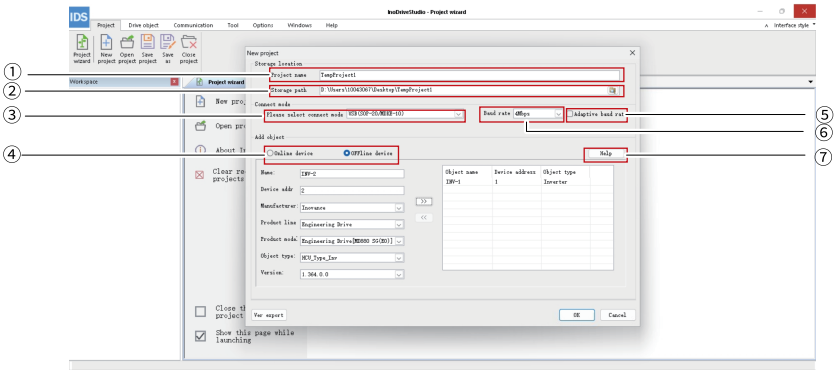



Figure 5-3 New project

Table 5–6 Common configuration items for new project

| No. | Name | Description |
|---|---|---|
| ① | Project name | Indicates the name of the project. |
| ② | Storage path | Indicates the storage path of the project. |
| ③ | Connection mode | Indicates the connection mode in which the device is scanned by the software. |
| ④ | Object type | Indicates whether the device is online or offline. |
| ⑤ | Adaptive baud rate | If adaptive baud rate is selected, the software scans all the baud rates available for device connection. In that case, the baud rate set in drop-down box (as shown in ⑥) is invalid. |
| ⑥ | Baud rate | Indicates the baud rate when the device is connected to the software in USB mode. |
| ⑦ | Help | Indicates the help document on project creation. |

If an online device is selected, you need to configure the following information.

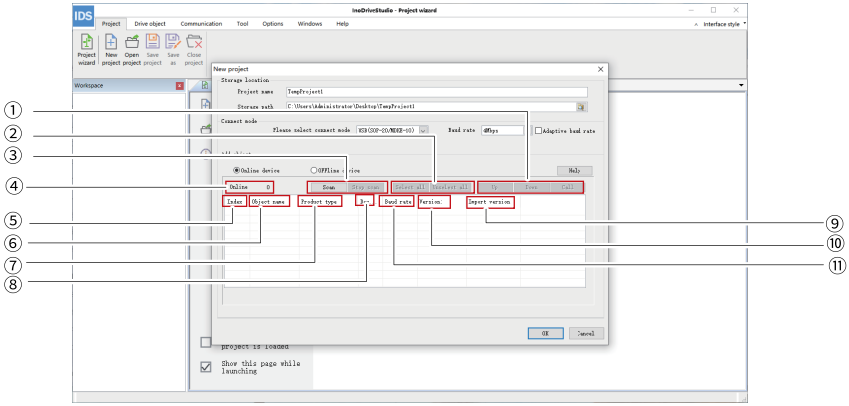



Figure 5-4 Adding an online device

Table 5–7 Configuration items for adding an online device

| No. | Name | Description |
|---|---|---|
| ① | Up/Down, Call | Used to organize the scanned devices manually and call the selected device to facilitate identification for users. |
| ② | Select/ Unselect all | Used to select/unselect all scanned devices. |
| ③ | Scan | Used to start/stop scanning the device. |
| ④ | Online | Indicates the number of online devices scanned. |
| ⑤ | Index | Indicates the number of the scanned device. |
| ⑥ | Object name | Indicates the name of the scanned device. |
| ⑦ | Product type | Indicates the product type of the scanned device. |
| ⑧ | Device address | Indicates the station number of the scanned device. |
| ⑨ | Import version | Indicates whether the parameter version of the scanned device has been imported. |
| ⑩ | Version | Indicates the parameter version of the scanned device. |
| ⑪ | Baud rate | Indicates the communication baud rate of the scanned device. |

## 5.2 TCP/IP(HETN-10/HPCU/HPFN-20/HEIP-10)

### 5.2.1 Overview

InoDriveStudio supports connection with multiple communication cards.

| Communication card | Description | Related document |
|---|---|---|
| HETN-10 (Ethernet) | Direct connection with PC is supported, with a maximum of 20 HETN-10 modules by default. Otherwise, communication with the software gets stuck. | HETN-10 Ethernet Adapter Module User Guide |
| HPCU | Direct connection with PC is supported, with a maximum of 20 HPCU modules by default. Otherwise, communication with the software gets stuck. | HPCU Parallel Control Module User Guide |
| HPFN-20 (PROFINET IRT) | Direct connection with PC is supported, with a maximum of 20 HPFN-20 modules by default. Otherwise, communication with the software gets stuck. | HPFN-20 PROFINET IRT Industrial Ethernet Adapter Module User Guide |
| HEIP-10 (EtherNet/ IP) | Direct connection with PC is supported, with a maximum of 20 HEIP-10 modules by default. Otherwise, communication with the software gets stuck. | HEIP-10 PROFINET IP Ethernet Adapter Module User Guide |

For example, the Ethernet module (hereinafter referred to as HETN-10) complies with the international Ethernet standards. This module is mainly applied in MD880 series drives to allow the MD880 series drive to become a slave of Ethernet. This improves the communication efficiency of the system and enriches the networking functions of the MD880 series drives. It can be used together with InoDriveStudio to implement commissioning functions.

## *Note*

This section takes HETN-10 as an example. For details, see the related manual.

### 5.2.2 Status Indicators

The HETN has three indicators which indicate different status as follows.

Table 5–8 Descriptions of HETN indicators

| Name | Status | Description |
|---|---|---|
| INOBUS Internal communication status indicator | Steady green | Communication with the HCU is normal. |
| | Flashing green | Failed to communicate or establish communication with HCU |
| MODULE module status indicator | Steady green | Operating normally |
| | Flashing red | MAC address error |
| | Steady red | Initialization protocol stack error |
| | Flashing orange | Failed to obtain the parameter (IP) |
| FIELDBUS External communication status indicator | Steady green | Communication OK |
| | Flashing green | Normal commissioning command received |
| | Flashing orange | Broadcast command received |
| | Flashing red | Data frame parsing error |

### 5.2.3 Connecting to the PC

Insert the Ethernet card into the expansion slot of the controller, and connect it to the PC through the network cable.

Ensure that the IP address of the Ethernet card is on the same network segment as the IP address of the PC. The operations are as follows:

1. Open InoDriveStudio. Click “New project” in the toolbar, and the following pop-up box appears. Select “TCP/IP (HETN-10/HPCU)” for the connection method, and click “Scan”. If the Ethernet card is connected to the PC for the first time, the IP address may not be on the same network segment as the IP address of the PC, making the object name and parameter version of the device unknown. Record the IP address scanned.

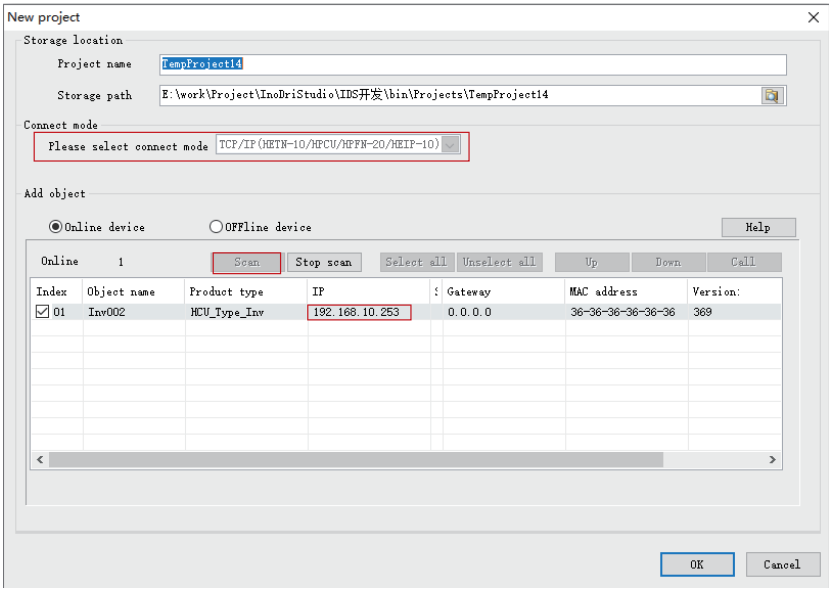



Figure 5-5 Scanning the device

2. Modify the IP address of the PC.

a. Take Windows 10 as an example. Right-click the network icon, select “Network and Internet > Ethernet > Change adapter options”. For other Windows versions, the operations are of little difference.

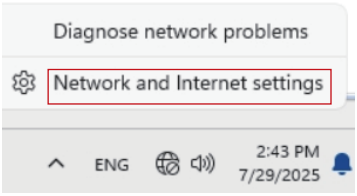
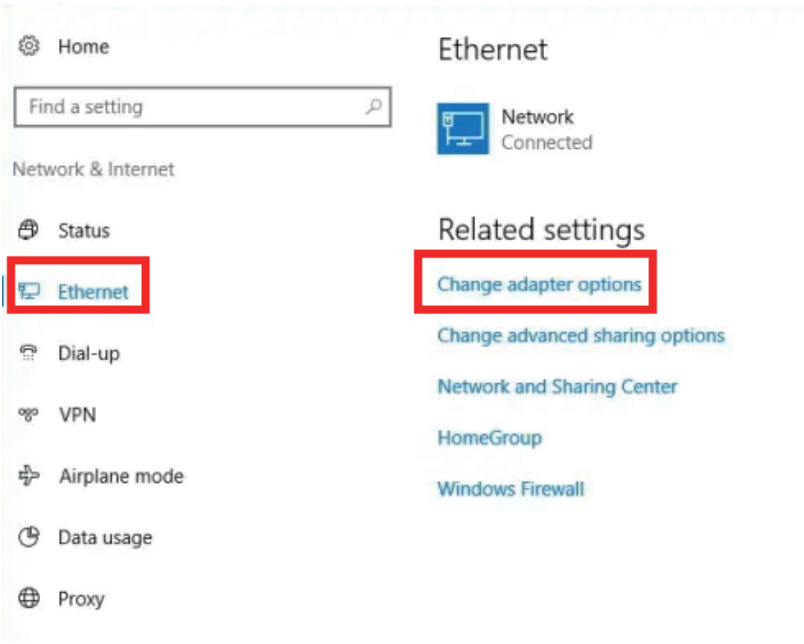



Figure 5-6 Changing adapter options




b. Right-click “Ethernet”. Select “Properties > Internet Protocol Version 4 (TCP/IPv4)” to modify the IP address and subnet mask so that the IP addresses of the PC and the Ethernet card are in the same LAN.

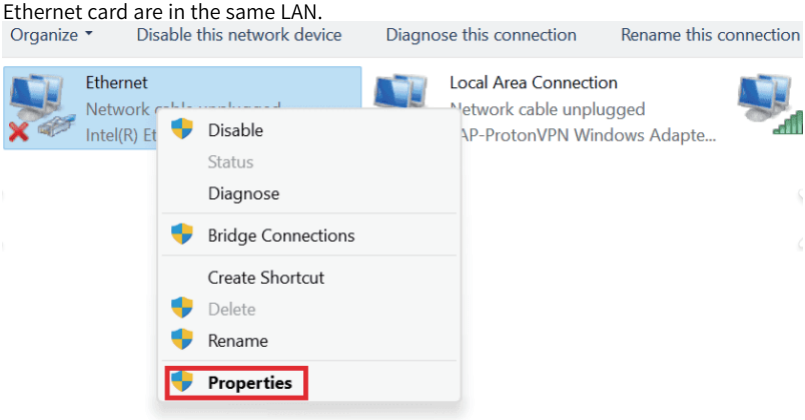
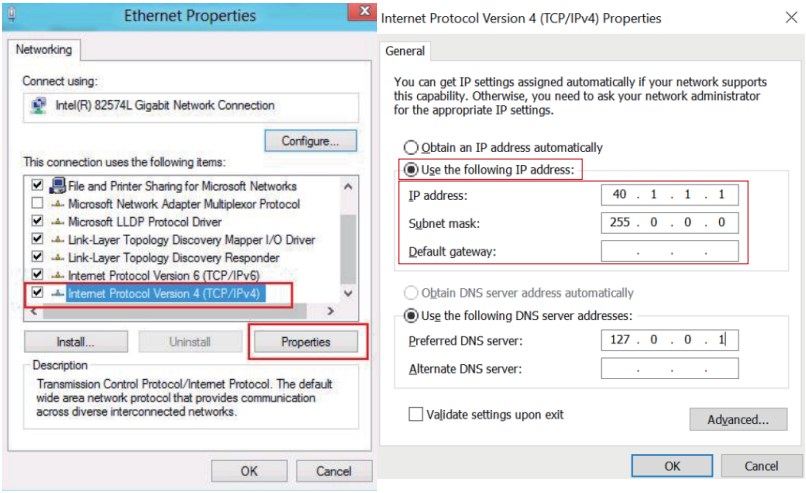



Figure 5-7 Modifying IPv4 address




3. Verify that the IP address configuration is successful.

   Open the InoDriveStudio. Click “New project”, select “TCP/IP(HETN-10)” for the connection mode, and click “Scan”. The following interface is displayed, indicating that the IP address configuration is successful and that the Ethernet card is successfully connected to the PC.

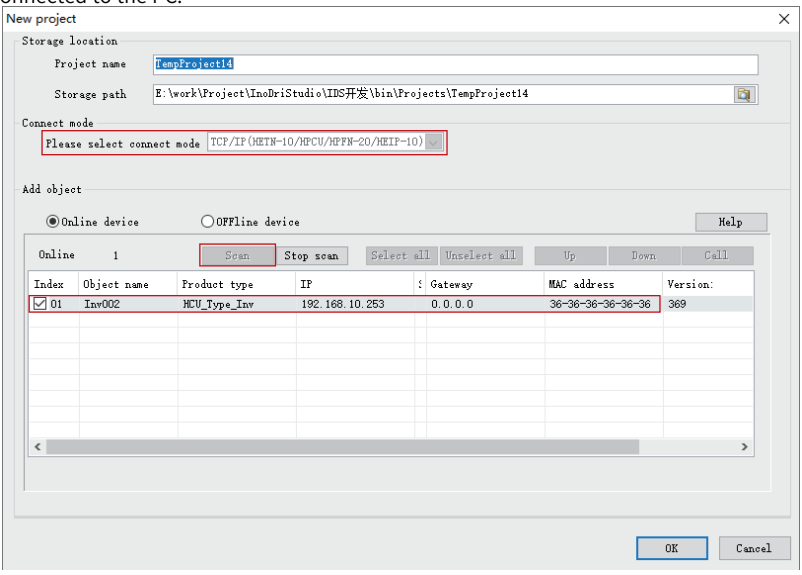



Figure 5-8 Scanning the Ethernet card

## 5.3 TCP/IP(HGW-10)

### 5.3.1 Overview

The HGW-10 digital gateway commissioning monitoring module (hereinafter referred to as HGW-10 or gateway) is a dedicated gateway for data exchange among Ethernet, commissioning network, and data acquisition system. The Ethernet complies with the international industrial Ethernet standards.

- This module is mainly applied in MD880 series high performance drives to enable centralized commissioning and operation data acquisition functions of the MD880 series.
- Remote local area network (LAN) can be set up using HGW-10 together with the IoT module to achieve remote commissioning and maintenance. The HGW-10 improves the networking capability of the system and enriches the commissioning and maintenance methods for MD880 drives, thus improving user experience.

For details on the gateway, see *HGW-10 Digital Gateway Commissioning Monitoring Module User Guide*.

### 5.3.2 Status Indicators

The following table describes the status indicators of HGW-10.

Table 5–9 Descriptions of gateway status indicators

| Name | Status | Description |
|---|---|---|
| PWR (Power supply indicator) | OFF | 24 V power supply is not available or the power supply voltage is excessively low. |
| | Steady ON | 24 V power supply is available. |
| STA (Work mode indicator) | Single flash | The system is in routing mode. Port-A and Port-B are connected to SOP-20-880 and HCU respectively. |
| | Double flash | The system is in relay mode. Both Port-A and Port-B are connected to HCU. |

| Name | Status | Description |
|---|---|---|
| MON (Data collection service status) | OFF | The data acquisition service is not enabled. |
| | Single flash | Data transmission is not supported currently.<br>Possible cause:<br>• The Ethernet is disconnected.<br>• UDP initialization failure |
| | Double flash | A remote IP address error occurs.<br>Possible cause:<br>• The default gateway does not match the remote IP address.<br>• The remote IP address does not exist. |
| | Triple flash | The data acquisition service is enabled, but no InoLink data is received. |
| | Steady ON | The data acquisition service runs properly. |
| ETH (Ethernet status indicator) | OFF | The Ethernet is disconnected. |
| | Single flash | The Ethernet is connected, but TCP connection is not established. |
| | Double flash | The TCP connection is established and is in burning state. |
| | Triple flash | The TCP connection is established, but no data is received. |
| | Steady ON | The TCP connection is established, and the data is received. |
| ERR (Error indicator) | Continuous quick flash | The indicator flashes at 5 Hz, indicating the 24 V input power supply voltage is low. |
| | Double flash | The parameter initialization is not completed. |
| | Triple flash | The MAC address is not initialized. |
| | Steady ON | The system is faulty. |
| | Discontinuous quick flash | The indicator flashes at 10 Hz, indicating that a CRC error occurs in the data received from InoLink or UART. |
| | Slow flash | The indicator flashes at 1 Hz, indicating that an alarm occurs in the system. |
| | OFF | No error |

### 5.3.3 Connecting to the PC

The procedure for placing the safety pipe of the waterproof baffle is as follows.

1. Perform the power-on inspection. Power on the system and check the status of the indicator and DIP switch. If the gateway is configured for the first time, ensure that all SW switches at the bottom of the gateway are OFF.

2. Configure the IP address of the gateway. If the gateway is configured for the first time, you must configure the IP address-related information. Connect HGW-10 directly to the PC through network cable. Open the InoDriveStudio to create a project. Select “TCP/IP (HGW-10)” for the connection mode and “Scan” for IP acquisition mode. Click “Scan”, and the gateway is detected. Modify IP address-related information in the list. After that, click “Scan” to check whether the IP address is modified successfully. Configure the IP address, subnet mask, and default gateway correctly to ensure that the digital gateway and the PC are on the same network segment. Otherwise, the commissioning cannot be performed.

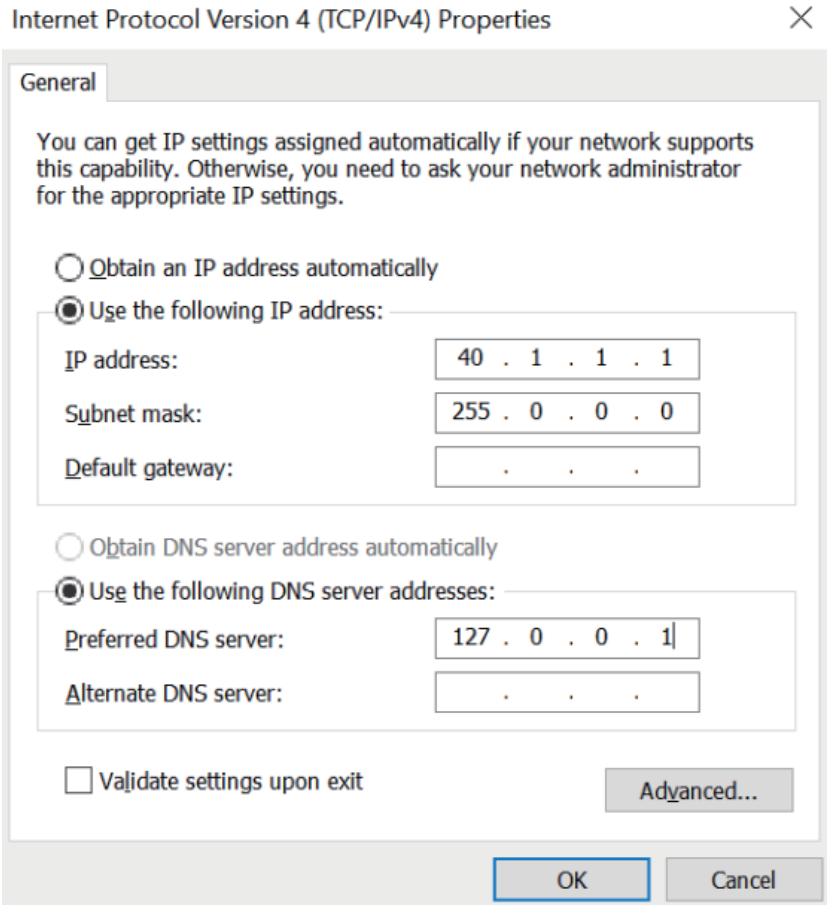
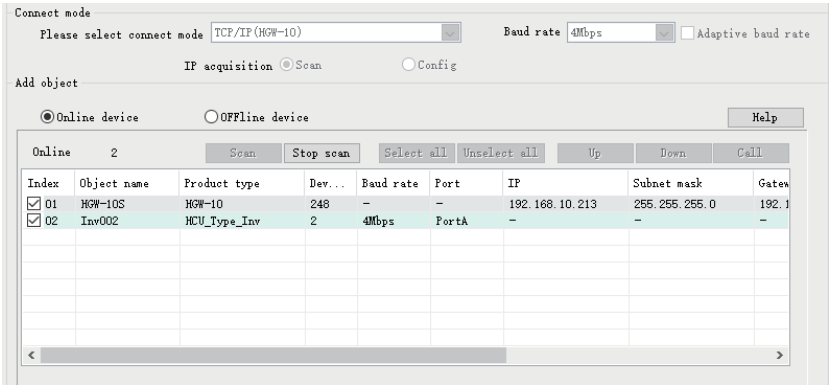



Figure 5-9 Configuring the IP address




3. Set the station number and baud rate for cascaded drives. Use SOP-20-880 or the commissioning software to set the baud rate and station number for each drive separately. Ensure that all devices cascaded to the same gateway share the same baud rate with different station number.
4. Set up the commissioning network.
   - Bridge mode: If SOP-20-880 is required for the drives on site, set SW1 to OFF. The gateway then works in the bridge mode, which supports up to 32 cascaded drives. Multiple gateways are required for connection with more than 32 cascaded drives. Connect SOP-20-880 and the cascaded drives to RJ45-A and RJ45-B ports of the gateway respectively.
   - Relay mode: If SOP-20-880 is not required for the drives on site and more than 32 drives are cascaded, set SW3 to ON. The gateway then works in the relay mode. After cascaded by groups, the drives are connected to RJ45-A or RJ45-B port of the gateway.
5. Set up the data acquisition network.
   a. The data acquisition function only applies to MD880 drives with HCU controller and adopts InoLink link as the communication link.
   b. Cascade the InoLink links of HCU controllers to InoLink-A or InoLink-B port of the gateway. Each port supports a maximum of 16 InoLink nodes.
   c. For details on InoLink parameter settings, see related HCU controller software guide.
6. Configure data acquisition parameters.
   a. By default, the value of A4-00 (data acquisition enabling) is 2 (SW2). In this case, if SW2 is OFF, the data acquisition function is disabled (by default); if SW2 is ON, the data acquisition function is enabled. The data acquisition function can also be configured by setting A4-00 to 0 (disabled) or 1 (enabled).
   b. For details on data acquisition configuration, see related parameters on data acquisition function.
7. Set up the Ethernet connection. Configure the Ethernet link according to the actual application scenario.

8. Create a project and configure the scan mode. The data gateway serves as the relay module for the downlink communication of InoDriveStudio. When creating a project, select “TCP/IP (HGW-10)” for the connection mode and “Scan” or “Config” for gateway IP acquisition mode.

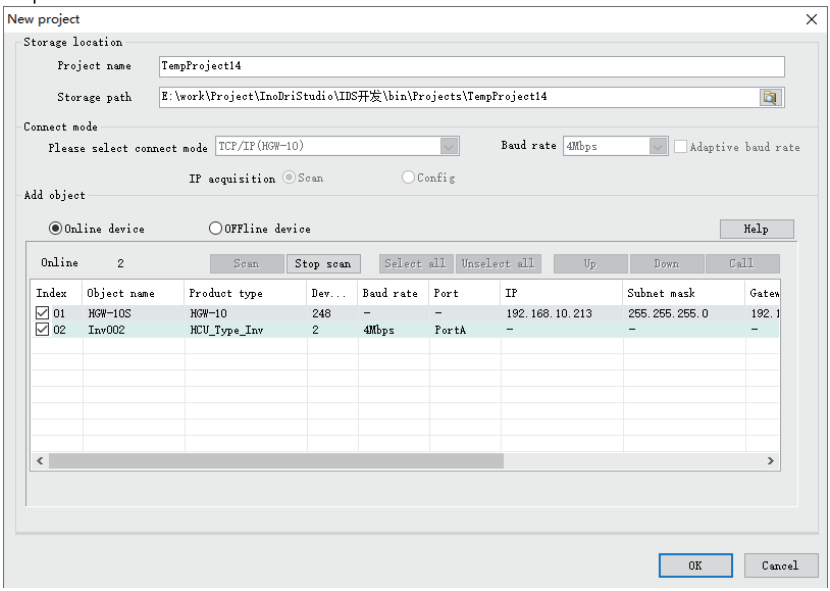



Figure 5-10 Scanning the gateway and related device

When “Scan” is selected for IP acquisition, click “Scan”, and all gateways and cascaded devices in the local area network will be scanned automatically.

When "Config" is selected for IP acquisition, set the IP address manually. Click "Scan" to obtain the gateway and cascaded devices of the specified IP.

9. Click “OK”, and a project is created. Then, perform commissioning and maintenance for the drive.

# 6 Basic Functions

This chapter describes the basic functions of InoDriveStudio, including parameter list, waveform recording and analysis, diagnosis and commissioning, device management, function diagram, and graphical programming.

## 6.1 Parameter Setting Wizard

The parameter setting wizard is one of the basic functions that allows new users to quickly understand the device and set parameters. For details, see section “Setting Basic Parameters” in *MD880 Series AC Drive Commissioning Guide (HCU-50S, HCU-51S, HCU-50S-CS, and HCU-51S-CS)*.

## 6.2 Parameter List

### 6.2.1 Overview

This chapter describes functions of the parameter list. The parameter list is a basic function of InoDriveStudio. After the device is connected, go to “Parameter list > Parameter list” to display the parameter list of current device, as shown in the following figure.

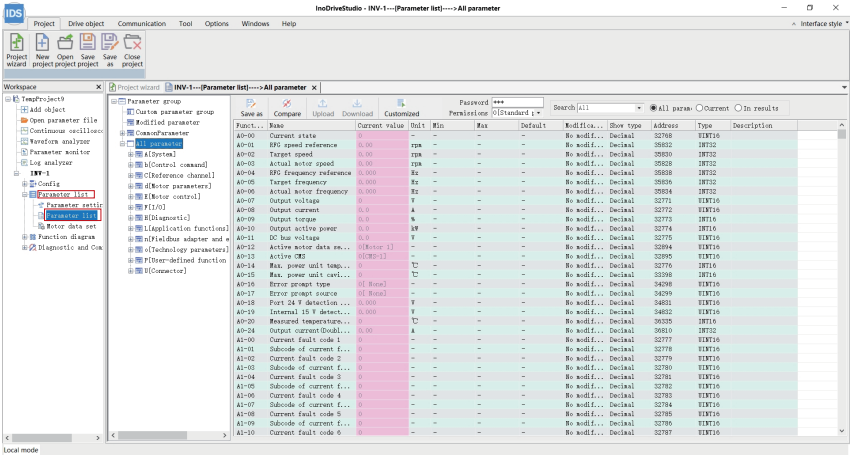


Figure 6-1 Parameter list

### 6.2.2 Parameter List Interface

Parameter groups are located on the left side of the parameter list page. The parameters and toolbar are displayed on the right side of the page.

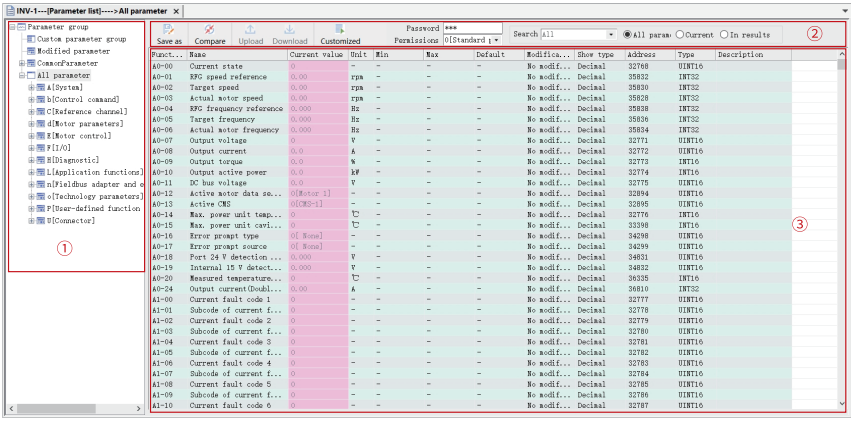



Figure 6-2 Areas of parameter list interface

Table 6–1 Areas of parameter list interface

| No. | Name | Function description |
|---|---|---|
| ① | Parameter group | The parameter groups displays all parameter groups, including custom parameter groups, modified parameters, common parameter groups, and default parameter groups. Users can access specific parameter groups directly for commissioning, query, and modification. |
| ② | Toolbar | The toolbar provides shortcut functions, including parameter comparison, parameter backup and download, permission level switchover, and Search function. |
| ③ | Parameter display | The parameter display area presents parameters of specified parameter group filtered through the toolbar. You can view and modify the parameters in the parameter display area. |

## 6.2.3 Viewing and Modifying Parameters

You can use “Select the columns”, “Permissions”, and “Search” functions to view the parameters easily.

- The following figure shows the default settings of the “Select the column” function supported by the toolbar. As illustrated, the “Function code”, “Name”, “Current value”, “Unit” are displayed in gray, indicating that those columns cannot be checked or hidden and must be displayed. For columns of other attributes, you can check/uncheck the column to display/hide it.
  By default, the serial number and decimal places are not displayed. You can manually check “Index” and “Precision” to display those two attributes. After checking the columns to be displayed, click “OK”. The selected columns is displayed in the parameter display area.

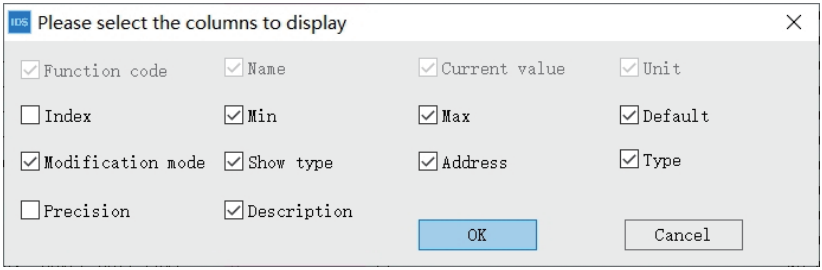



Figure 6-3 Displayed parameter columns

- The toolbar supports the switchover of parameter permission levels. Parameters can be divided into standard parameters, expansion parameters, expert parameters, and maintenance parameters, of which standard parameters are of the lowest permission level and maintenance parameters are of the highest permission level. Parameters displayed vary based on different permission levels. Password is required before switching to a higher permission level, but you can directly switch from low permission level to high permission level.

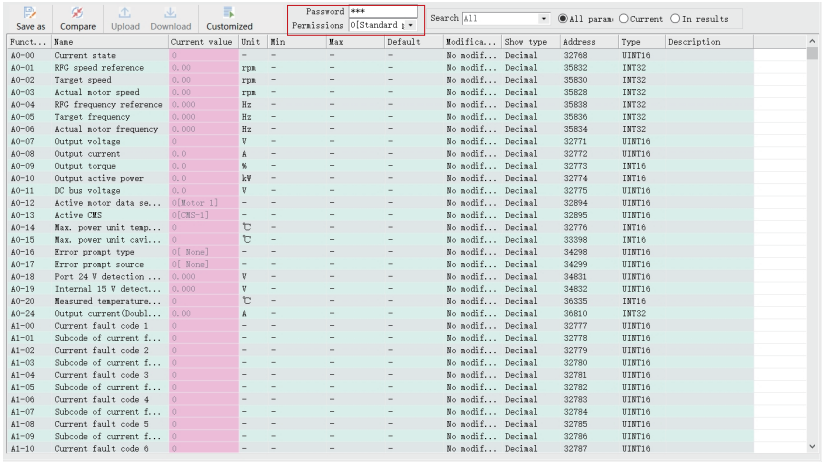
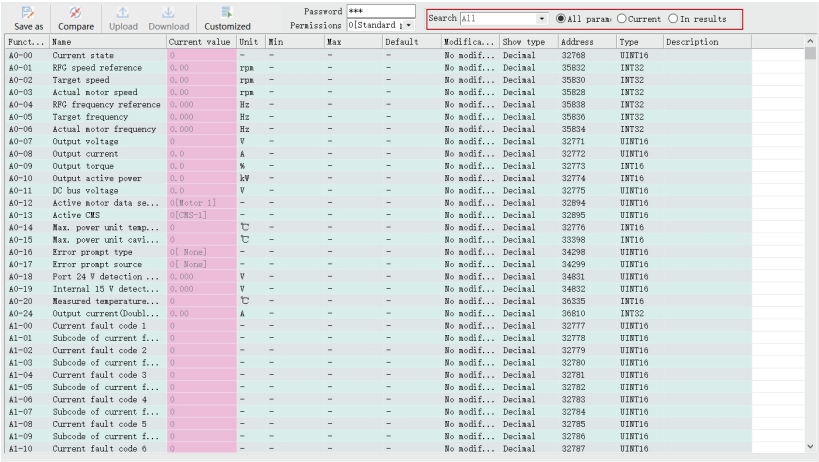



Figure 6-4 Permission level

If the device is offline and you need to view parameters of different permission levels, switch to the desired permission level in the aforementioned way. The parameter list is not refreshed immediately after you switch the parameter permission, which is different from the case in online status. Therefore, you need to close the parameter list page and open it again to refresh the parameter list page.

- You can search a parameter by parameter ID, parameter name, current value, modification mode, and communication address through the search function in the toolbar. In addition, scoped search is supported. That is, you can search a parameter within “All parameters”, “Current group”, or in the previous search results. The search results are displayed in the parameter display area.
  The search function supports keyword memory. All keywords searched are recorded in chronological order. If you want to continue the previous search, click the drop-down triangle  on the right side of the search box, and you can find the previous keyword.




| Funct... | Name | Current value | Unit | Min | Max | Default | Modifica... | Show type | Address | Type | Description |
|---|---|---|---|---|---|---|---|---|---|---|---|
| A0-00 | Current state | 0 | - | - | - | - | No modif... | Decimal | 32768 | UINT16 | |
| A0-01 | RPG speed reference | 0.00 | rpm | - | - | - | No modif... | Decimal | 35832 | INT32 | |
| A0-02 | Target speed | 0.00 | rpm | - | - | - | No modif... | Decimal | 35830 | INT32 | |
| A0-03 | Actual motor speed | 0.00 | rpm | - | - | - | No modif... | Decimal | 35828 | INT32 | |
| A0-04 | RPG frequency reference | 0.000 | Hz | - | - | - | No modif... | Decimal | 35838 | INT32 | |
| A0-05 | Target frequency | 0.000 | Hz | - | - | - | No modif... | Decimal | 35836 | INT32 | |
| A0-06 | Actual motor frequency | 0.000 | Hz | - | - | - | No modif... | Decimal | 35834 | INT32 | |
| A0-07 | Output voltage | 0 | V | - | - | - | No modif... | Decimal | 32771 | UINT16 | |
| A0-08 | Output current | 0.0 | A | - | - | - | No modif... | Decimal | 32772 | UINT16 | |
| A0-09 | Output torque | 0.0 | % | - | - | - | No modif... | Decimal | 32773 | INT16 | |
| A0-10 | Output active power | 0.0 | kW | - | - | - | No modif... | Decimal | 32774 | INT16 | |
| A0-11 | DC bus voltage | 0.0 | V | - | - | - | No modif... | Decimal | 32775 | UINT16 | |
| A0-12 | Active motor data se... | 0[Motor 1] | - | - | - | - | No modif... | Decimal | 32894 | UINT16 | |
| A0-13 | Active CMS | 0[CMS-1] | - | - | - | - | No modif... | Decimal | 32895 | UINT16 | |
| A0-14 | Max. power unit temp... | 0 | ℃ | - | - | - | No modif... | Decimal | 32776 | INT16 | |
| A0-15 | Max. power unit cavi... | 0 | ℃ | - | - | - | No modif... | Decimal | 33398 | INT16 | |
| A0-16 | Error prompt type | 0[ None] | - | - | - | - | No modif... | Decimal | 34298 | UINT16 | |
| A0-17 | Error prompt source | 0[ None] | - | - | - | - | No modif... | Decimal | 34299 | UINT16 | |
| A0-18 | Port 24 V detection ... | 0.000 | V | - | - | - | No modif... | Decimal | 34831 | UINT16 | |
| A0-19 | Internal 15 V detect... | 0.000 | V | - | - | - | No modif... | Decimal | 34832 | UINT16 | |
| A0-20 | Measured temperature... | 0 | ℃ | - | - | - | No modif... | Decimal | 36335 | INT16 | |
| A0-24 | Output current(Doubl... | 0.00 | A | - | - | - | No modif... | Decimal | 36810 | INT32 | |
| A1-00 | Current fault code 1 | 0 | - | - | - | - | No modif... | Decimal | 32777 | UINT16 | |
| A1-01 | Subcode of current f... | 0 | - | - | - | - | No modif... | Decimal | 32778 | UINT16 | |
| A1-02 | Current fault code 2 | 0 | - | - | - | - | No modif... | Decimal | 32779 | UINT16 | |
| A1-03 | Subcode of current f... | 0 | - | - | - | - | No modif... | Decimal | 32780 | UINT16 | |
| A1-04 | Current fault code 3 | 0 | - | - | - | - | No modif... | Decimal | 32781 | UINT16 | |
| A1-05 | Subcode of current f... | 0 | - | - | - | - | No modif... | Decimal | 32782 | UINT16 | |
| A1-06 | Current fault code 4 | 0 | - | - | - | - | No modif... | Decimal | 32783 | UINT16 | |
| A1-07 | Subcode of current f... | 0 | - | - | - | - | No modif... | Decimal | 32784 | UINT16 | |
| A1-08 | Current fault code 5 | 0 | - | - | - | - | No modif... | Decimal | 32785 | UINT16 | |
| A1-09 | Subcode of current f... | 0 | - | - | - | - | No modif... | Decimal | 32786 | UINT16 | |
| A1-10 | Current fault code 6 | 0 | - | - | - | - | No modif... | Decimal | 32787 | UINT16 | |

Figure 6-5 Options

For parameter modification, there are three options including “No modification”, “Modification at stop”, and “Free modification”.

- "No modification" indicates that the parameter cannot be modified, which is usually used for connector parameters, parameters of monitoring group, and certain system status parameters.
- "Modification at stop" indicates that the parameter can be modified only in the stop state, which is usually used for parameters related to motor running. That type of parameter cannot be modified during motor running.
- “Free modification” indicates that the parameter can be modified to any value within the specified range. Most parameters can be modified any time.

Parameters can be displayed in text box, multi-bits, and drop-down box.

- To modify a parameter that is displayed in text box, input a new value and press Enter.
- To modify a parameter that is displayed in multiple bits, click “Current value”, and a bulging square appears to the right of the text box. Click to display the following interface.

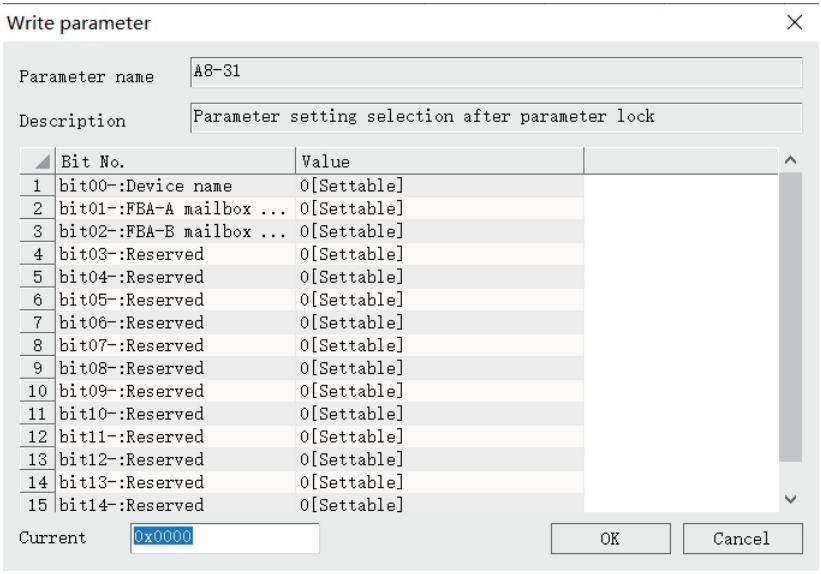
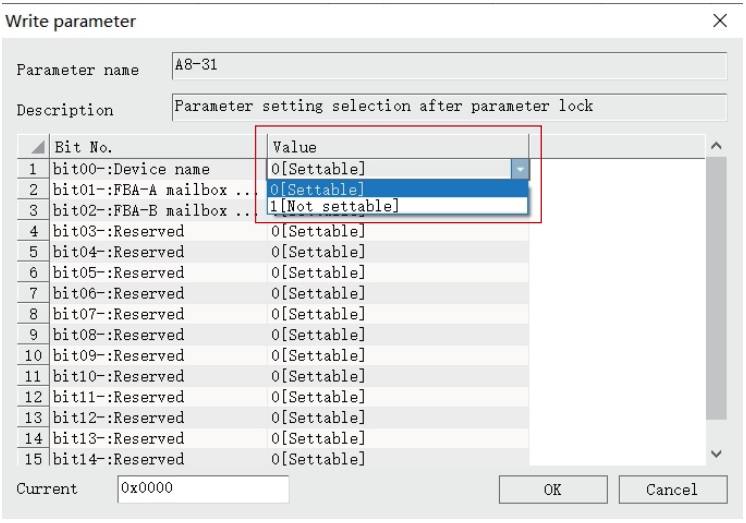
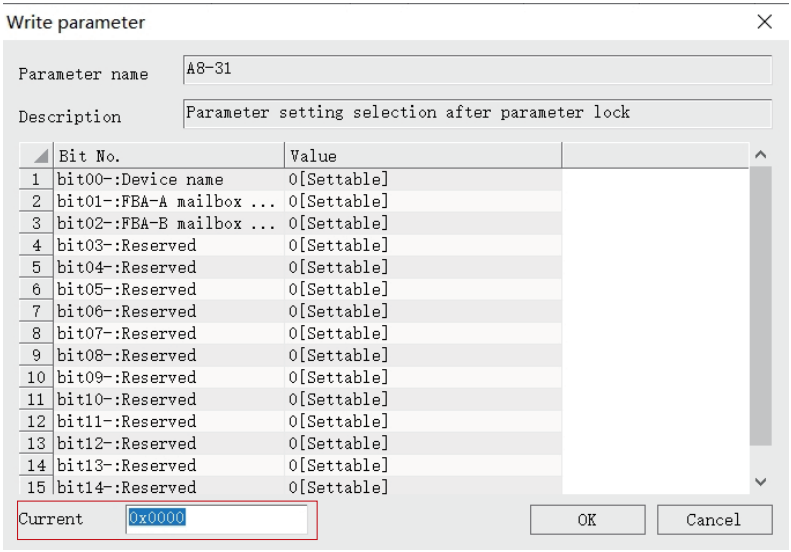



Figure 6-6 Multi-bit parameters

- Each bit is displayed in a drop-down box. You can set the value of each bit to 0 or 1, thus determining the value of the parameter.




- You can also set the parameter value through the hexadecimal number of the current value at the bottom left of the page displayed.




- To modify a parameter displayed in the drop-down box, scroll down to set the value as necessary. For some parameters displayed in the drop-down box, the option “Other” is available. The “Other” option includes B connector and K connector.
  - B connector indicates bit connector. The value of a bit connector can only be 0 or 1.
  - K connector indicates word connector or double word connector.
    - A word connector is an unsigned 16-bit integer ranging from 0 to 65535.
    - A double word connector is an unsigned 32-bit integer ranging from 0 to 4294967295.

  The “Other” option allows for great expansion of parameter input values, greatly improving system flexibility.

### 6.2.4 Parameter Comparison

Click 

in the toolbar to display the following page.

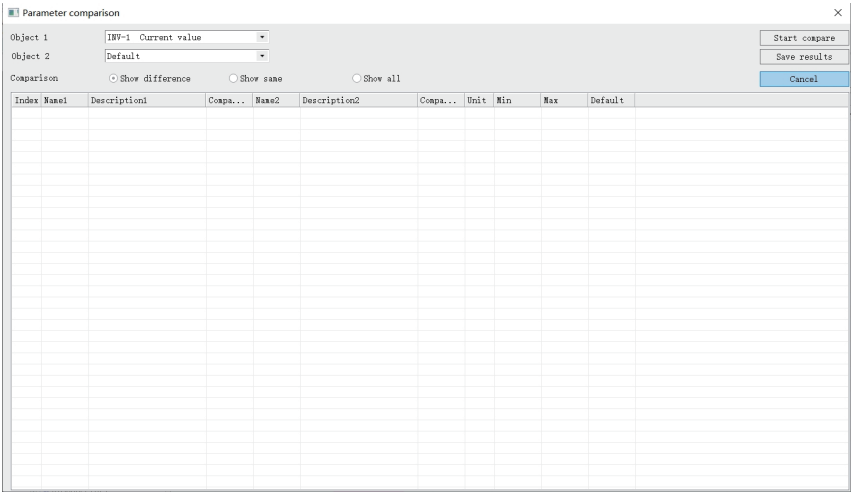



Figure 6-7 Parameter comparison

Select two objects for comparison. Specifically, you can select the current value or previously stored parameter file as object 1 or object 2. You can also select the default value as object 2.

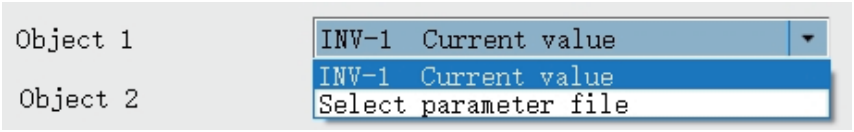



Figure 6-8 Options of object 1

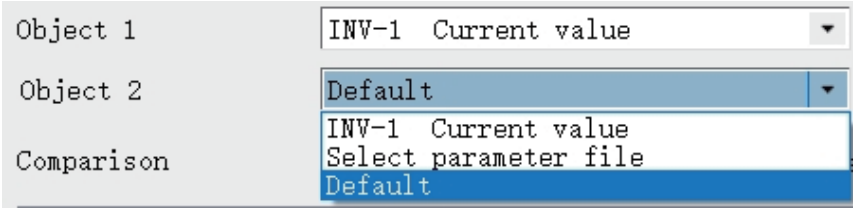



Figure 6-9 Options of object 2

If the comparison object is a parameter file, the following page appears. Select the parameter file with the suffix .inoprm.

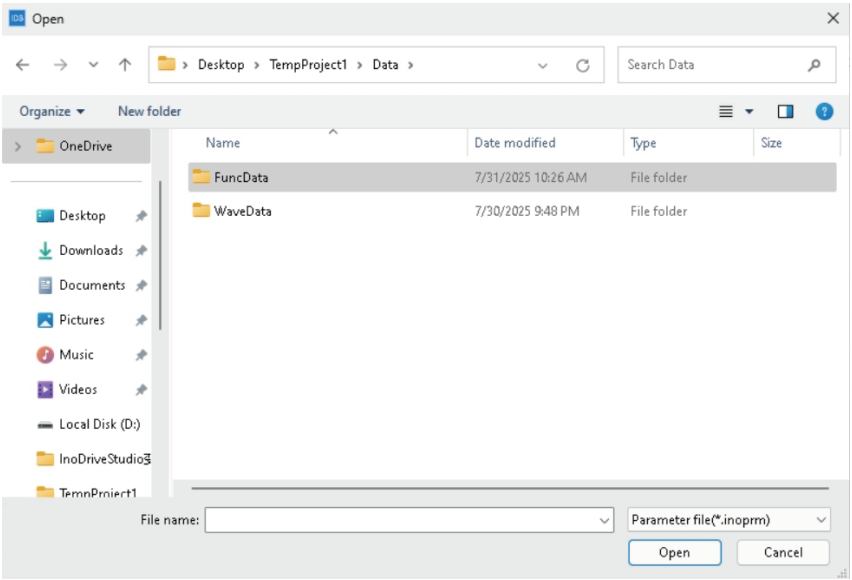


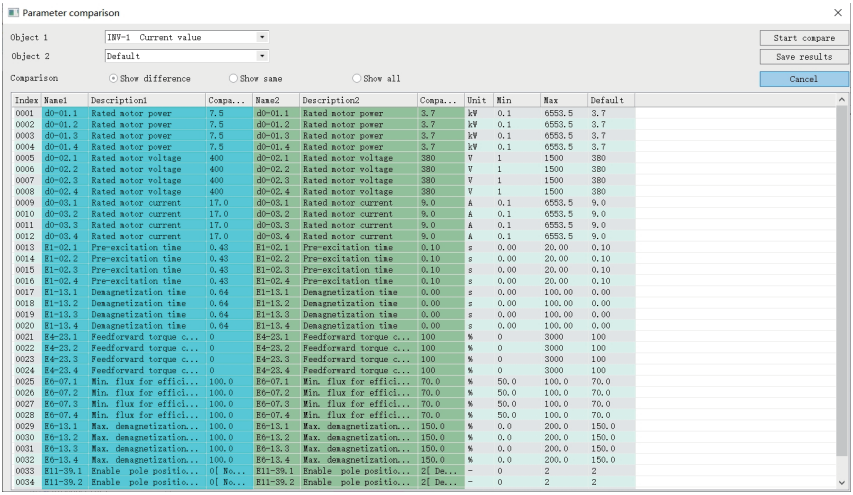

Figure 6-10 Parameter file selected for comparison

Set different comparison conditions for the comparison objects, specifically, “Show difference”, “Show same”, and “Show all”.

Click “Start compare”. If “Upload parameters before comparing” is checked, the current parameters are uploaded before comparison. Otherwise, the current parameters will not be uploaded. Then, the comparison results are displayed on InoDriveStudio.

- Object 1 is displayed in blue on the left, indicating the name, description, and comparison value.
- Object 2 is displayed in green on the right, indicating the name, description, and comparison value.

Additionally, the unit, minimum value, maximum value, and default value of the compared parameter are displayed.




| Index | Name1 | Description1 | Compa... | Name2 | Description2 | Compa... | Unit | Min | Max | Default |
|---|---|---|---|---|---|---|---|---|---|---|
| 0001 | d0-01.1 | Rated motor power | 7.5 | d0-01.1 | Rated motor power | 3.7 | kW | 0.1 | 6553.5 | 3.7 |
| 0002 | d0-01.2 | Rated motor power | 7.5 | d0-01.2 | Rated motor power | 3.7 | kW | 0.1 | 6553.5 | 3.7 |
| 0003 | d0-01.3 | Rated motor power | 7.5 | d0-01.3 | Rated motor power | 3.7 | kW | 0.1 | 6553.5 | 3.7 |
| 0004 | d0-01.4 | Rated motor power | 7.5 | d0-01.4 | Rated motor power | 3.7 | kW | 0.1 | 6553.5 | 3.7 |
| 0005 | d0-02.1 | Rated motor voltage | 400 | d0-02.1 | Rated motor voltage | 380 | V | 1 | 1500 | 380 |
| 0006 | d0-02.2 | Rated motor voltage | 400 | d0-02.2 | Rated motor voltage | 380 | V | 1 | 1500 | 380 |
| 0007 | d0-02.3 | Rated motor voltage | 400 | d0-02.3 | Rated motor voltage | 380 | V | 1 | 1500 | 380 |
| 0008 | d0-02.4 | Rated motor voltage | 400 | d0-02.4 | Rated motor voltage | 380 | V | 1 | 1500 | 380 |
| 0009 | d0-03.1 | Rated motor current | 17.0 | d0-03.1 | Rated motor current | 9.0 | A | 0.1 | 6553.5 | 9.0 |
| 0010 | d0-03.2 | Rated motor current | 17.0 | d0-03.2 | Rated motor current | 9.0 | A | 0.1 | 6553.5 | 9.0 |
| 0011 | d0-03.3 | Rated motor current | 17.0 | d0-03.3 | Rated motor current | 9.0 | A | 0.1 | 6553.5 | 9.0 |
| 0012 | d0-03.4 | Rated motor current | 17.0 | d0-03.4 | Rated motor current | 9.0 | A | 0.1 | 6553.5 | 9.0 |
| 0013 | E1-02.1 | Pre-excitation time | 0.43 | E1-02.1 | Pre-excitation time | 0.10 | s | 0.00 | 20.00 | 0.10 |
| 0014 | E1-02.2 | Pre-excitation time | 0.43 | E1-02.2 | Pre-excitation time | 0.10 | s | 0.00 | 20.00 | 0.10 |
| 0015 | E1-02.3 | Pre-excitation time | 0.43 | E1-02.3 | Pre-excitation time | 0.10 | s | 0.00 | 20.00 | 0.10 |
| 0016 | E1-02.4 | Pre-excitation time | 0.43 | E1-02.4 | Pre-excitation time | 0.10 | s | 0.00 | 20.00 | 0.10 |
| 0017 | E1-13.1 | Demagnetization time | 0.64 | E1-13.1 | Demagnetization time | 0.00 | s | 0.00 | 100.00 | 0.00 |
| 0018 | E1-13.2 | Demagnetization time | 0.64 | E1-13.2 | Demagnetization time | 0.00 | s | 0.00 | 100.00 | 0.00 |
| 0019 | E1-13.3 | Demagnetization time | 0.64 | E1-13.3 | Demagnetization time | 0.00 | s | 0.00 | 100.00 | 0.00 |
| 0020 | E1-13.4 | Demagnetization time | 0.64 | E1-13.4 | Demagnetization time | 0.00 | s | 0.00 | 100.00 | 0.00 |
| 0021 | E4-23.1 | Feedforward torque c... | 0 | E4-23.1 | Feedforward torque c... | 100 | % | 0 | 3000 | 100 |
| 0022 | E4-23.2 | Feedforward torque c... | 0 | E4-23.2 | Feedforward torque c... | 100 | % | 0 | 3000 | 100 |
| 0023 | E4-23.3 | Feedforward torque c... | 0 | E4-23.3 | Feedforward torque c... | 100 | % | 0 | 3000 | 100 |
| 0024 | E4-23.4 | Feedforward torque c... | 0 | E4-23.4 | Feedforward torque c... | 100 | % | 0 | 3000 | 100 |
| 0025 | E6-07.1 | Min. flux for effici... | 100.0 | E6-07.1 | Min. flux for effici... | 70.0 | % | 50.0 | 100.0 | 70.0 |
| 0026 | E6-07.2 | Min. flux for effici... | 100.0 | E6-07.2 | Min. flux for effici... | 70.0 | % | 50.0 | 100.0 | 70.0 |
| 0027 | E6-07.3 | Min. flux for effici... | 100.0 | E6-07.3 | Min. flux for effici... | 70.0 | % | 50.0 | 100.0 | 70.0 |
| 0028 | E6-07.4 | Min. flux for effici... | 100.0 | E6-07.4 | Min. flux for effici... | 70.0 | % | 50.0 | 100.0 | 70.0 |
| 0029 | E6-13.1 | Max. demagnetizatio... | 100.0 | E6-13.1 | Max. demagnetizatio... | 150.0 | % | 0.0 | 200.0 | 150.0 |
| 0030 | E6-13.2 | Max. demagnetizatio... | 100.0 | E6-13.2 | Max. demagnetizatio... | 150.0 | % | 0.0 | 200.0 | 150.0 |
| 0031 | E6-13.3 | Max. demagnetizatio... | 100.0 | E6-13.3 | Max. demagnetizatio... | 150.0 | % | 0.0 | 200.0 | 150.0 |
| 0032 | E6-13.4 | Max. demagnetizatio... | 100.0 | E6-13.4 | Max. demagnetizatio... | 150.0 | % | 0.0 | 200.0 | 150.0 |
| 0033 | E11-39.1 | Enable pole positio... | 0[ No... | E11-39.1 | Enable pole positio... | 2[ De... | - | 0 | 2 | 2 |
| 0034 | E11-39.2 | Enable pole positio... | 0[ No... | E11-39.2 | Enable pole positio... | 2[ De... | - | 0 | 2 | 2 |

Figure 6-11 Parameter comparison results

Click “Save results”, and the following page appears. Select the directory for saving the file and set the file name. Click “Save” to save the file as a csv file.

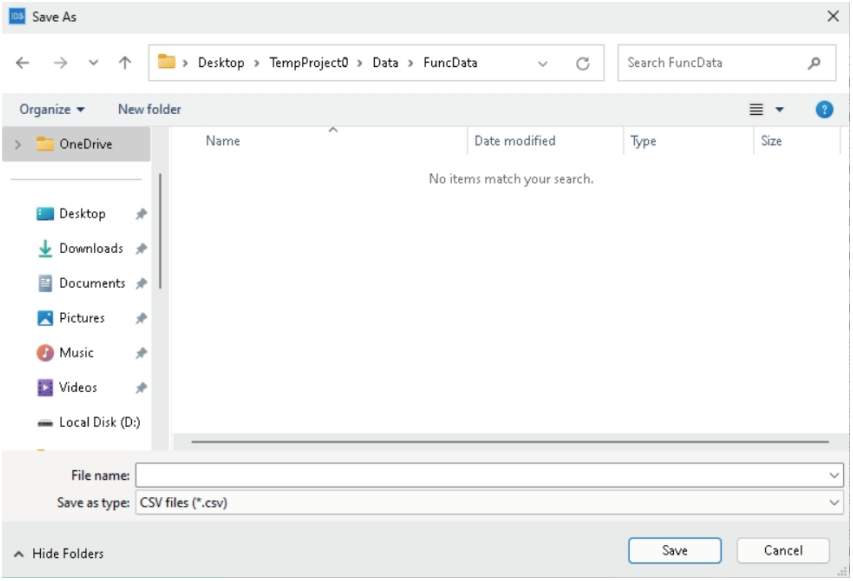



Figure 6-12 Storing comparison results

Click “Cancel” to close the parameter comparison page.

### 6.2.5 Parameter Backup and Download

The parameter list supports parameter backup. You can use InoDriveStudio to back up the parameters to your computer through the “Upload” or “Save as” function. Also, you can restore the backup parameters from your computer to the controller through the “Download” function.

- Backing up parameters through “Upload”
  Click “Upload” to open a file saving dialog box. Select the path and enter the file name. Then, click “Save” to upload and save all controller parameters to the file (.inoprm).

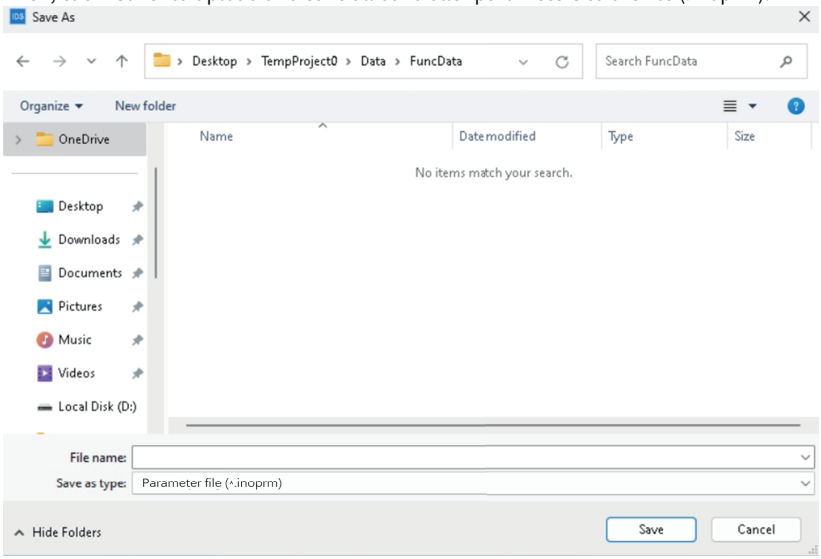



Figure 6-13 Parameter upload

- Backing up parameters through “Save as”
  Click to save the current parameter group as a file.
  - If the current parameter group contains all parameters, all parameters are saved. If the current parameter group is group b, all parameters in group b are saved.
  - If it is group b4, all parameters in group b4 are saved.

  Click “Save as”, and the following page is displayed. You need to customize the name, storage location, and type of the parameter file. You can set the file type as "Parameter file", "Parameter group file", "csv file", or "excel file". If “Upload parameters before saving” is checked, the current parameters are uploaded before being saved. Otherwise, the current parameters will not be uploaded. When you click “Save as” to back up parameters, select “Parameter file” as the file type and check “Upload parameters before saving”.

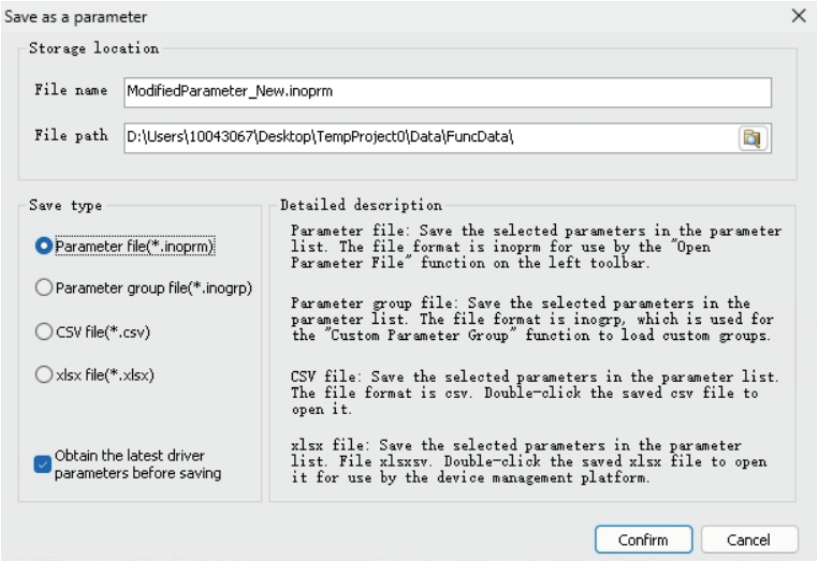



Figure 6-14 Save as

- Restoring parameters through “Download”
  Perform the Download operation in the Parameter List page to display the parameter download selection page. You can download part/all of the parameters.
  - Download part: All parameters are downloaded by default except motor parameters, model parameters, and communication rate and address of SOP-20-880. To download motor parameters, check “Download motor parameter”. Additionally, you can check “Download graphical programming” to download graphical programming. Model parameters cannot be downloaded when “Download part” is selected.
  - Model parameters can be downloaded when “Download all” is selected.

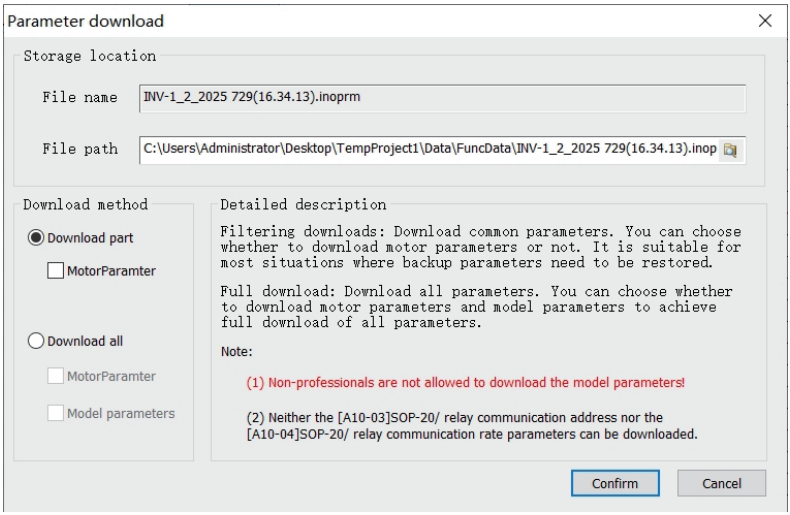



Figure 6-15 Parameter download

After selecting the parameter download mode, click “Confirm” to display a dialog box. Select the file and click “Open” to download the parameters from the file to the controller.

### 6.2.6 Custom Parameter Group

In addition to the default parameter groups, you can also customize the parameter groups as needed. Right-click “Custom parameter” and the following page appears. Then, you can select “New custom group” or “Load custom group” as necessary.

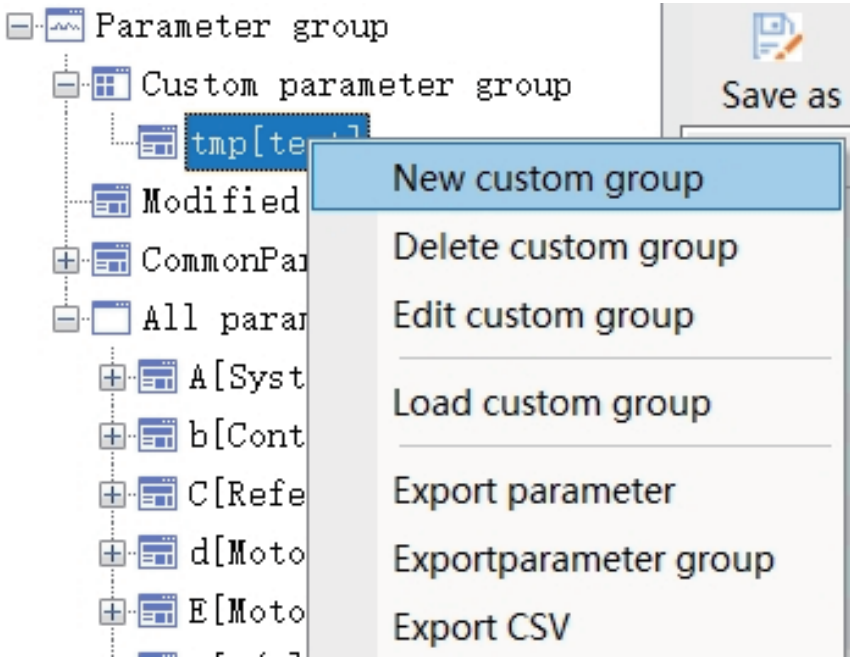



Figure 6-16 Custom parameter group

- If you select “New custom group”, the following page will be displayed.

1. First, input the name and description of the custom parameter group.

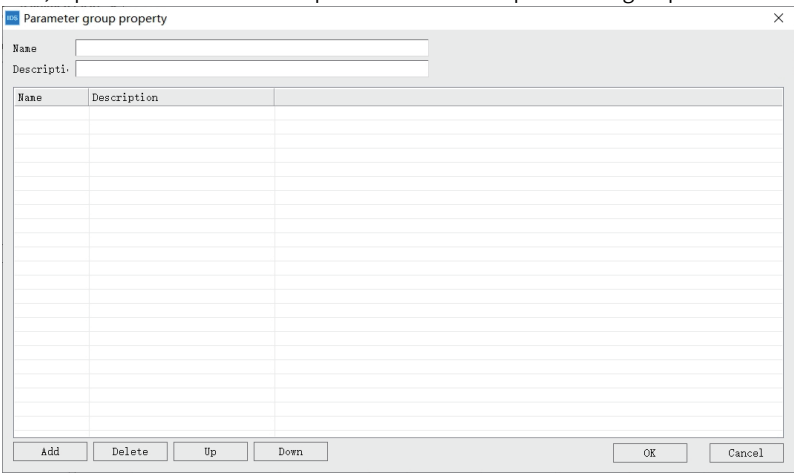



Figure 6-17 New custom group

2. Click “Add” to display the following page. You can double-click a specific parameter to add it, or select the parameter and click “Select” to add it. The added parameter is displayed in the table at the bottom left. To remove a parameter from the table at the bottom left, select the parameter, and then click “Delete”. To remove all selected parameters, click “Delete All”.

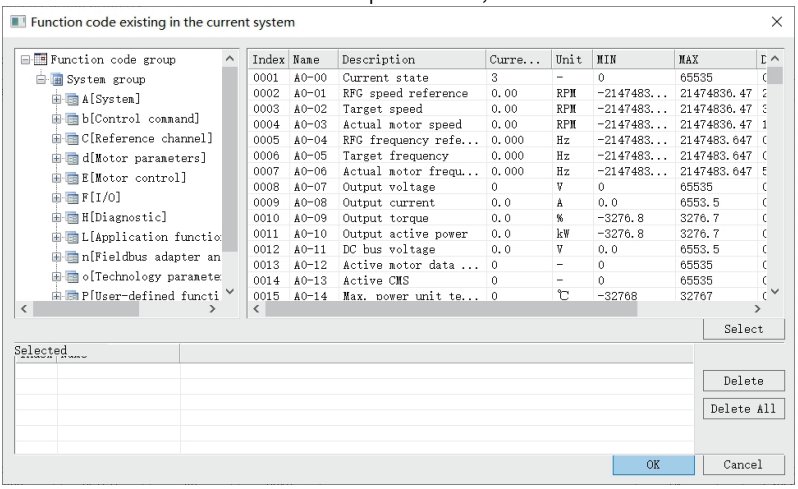



Figure 6-18 Adding a parameter to the custom parameter group

3. After adding the parameters, click “OK” to return to the previous page where you can still click “Delete”, “Up”, or “Down” to adjust parameter position properly.

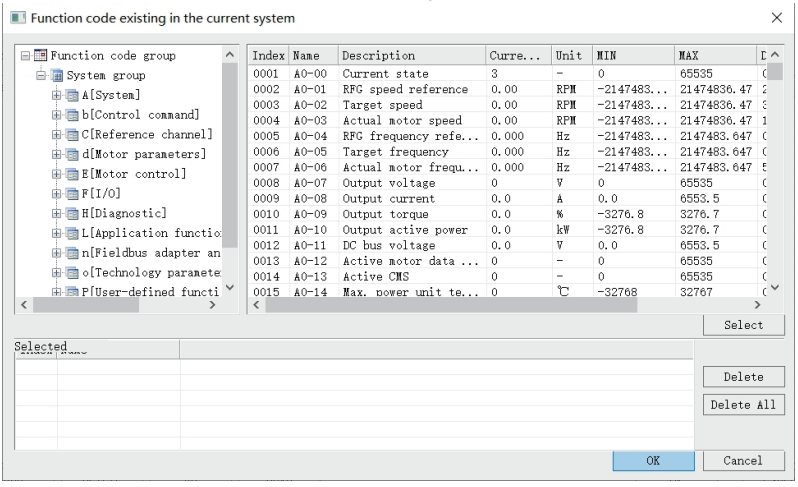



Figure 6-19 Editing custom parameter group

4. Then, click “OK”. The custom parameter group is displayed as “Name [Description]” in the parameter group area, as shown in the following.

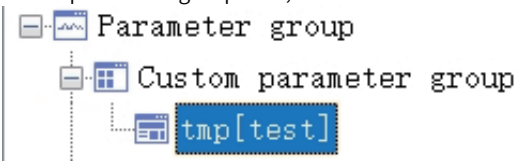



Figure 6-20 Newly created custom parameter group

- To load a saved parameter group file, select “Load custom group”.
  - You can create a custom group under the existing custom group.
  - To remove a custom parameter group, right-click on it and select “Delete custom group”.
  - You can still edit the custom parameter group.
  - You can right click on the custom parameter group to select “Export parameter”, “Export parameter group”, or “Export CSV” as required. Then, the “Save as” page appears. Rename the export file and select the directory for saving the file.

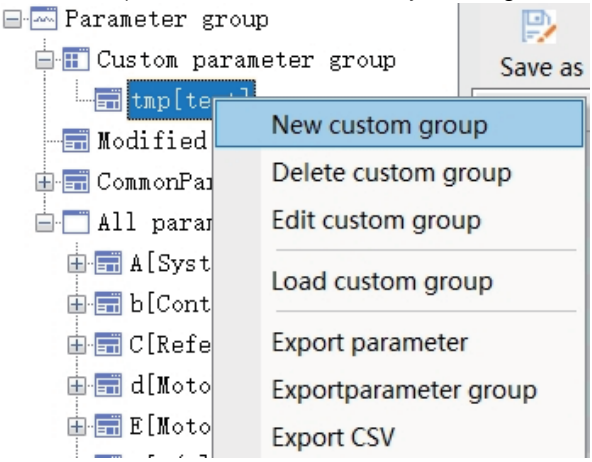



Figure 6-21 Operations on the custom parameter group

### 6.2.7 Common Parameters

No common parameter group is available for the current commissioning software to commission different devices. It still takes much effort to locate and modify parameters in different parameter groups for device commissioning. Therefore, the common parameter group function is added to the current mainstream control module to improve product usability.

Parameters are grouped into the common parameter group by frequency of use and function, which improves commissioning efficiency and enhances product usability.

Control modules that support common parameter groups:

Table 6–2 Control modules that support common parameter group

| Chip type | Object type |
|---|---|
| DSP-2807N | HCU-40 |
| | HCU-20 |
| | HCU-30 |
| | HCU-80 |
| ARM+DSP | MD580-INV |
| ARM-H723 (Unigroup) | HCU-50S/HCU-51S |
| | HCU-40 |
| | HCU-20 |
| | HCU-30 |
| | HCU-80 |
| ARM-H723 (Unigroup) | HCU-50T |

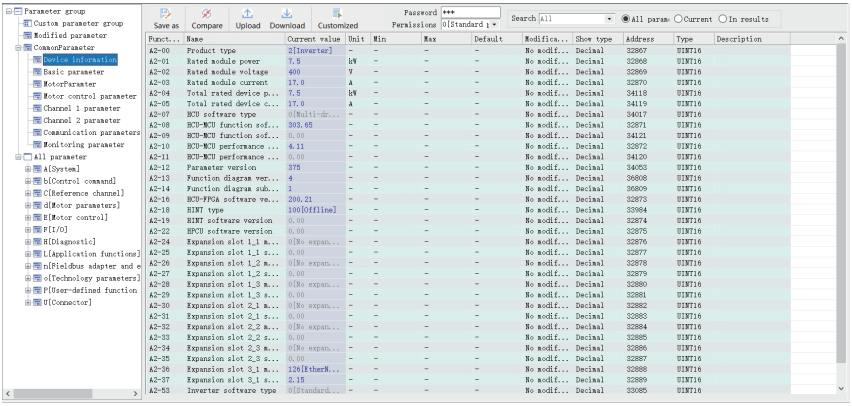



Figure 6-22 Common parameter group

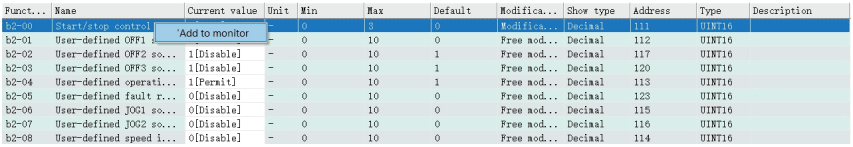
Take a standard inverter as an example. The parameter groups are as follows:

| Group | Meaning |
|---|---|
| Device information | Indicates the rated parameters, software version, and expansion card of the device. |
| Basic parameter | Indicates basic parameter information such as ramp and jog of the device. |
| Motor parameters | Indicates motor nameplate parameters. |

| Group | Meaning |
|---|---|
| Motor control parameter | Indicates parameters related to motor control. |
| Channel 1 parameter | Indicates parameters related to the command/reference source of channel 1. |
| Channel 2 parameter | Indicates parameters related to the command/reference source of channel 2. |
| Monitoring parameter | Indicates the system status parameter information. |

## 6.2.8 Parameter Monitoring List

You can monitor specific parameters easily. Right-click on the parameter to select “Add to monitor”, and the parameter is displayed in the monitoring list.

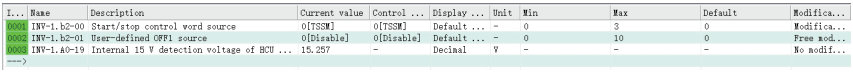



| Funct... | Name | Current value | Unit | Min | Max | Default | Modifica... | Show type | Address | Type | Description |
|---|---|---|---|---|---|---|---|---|---|---|---|
| b2-00 | Start/stop control | | - | 0 | 3 | 0 | Modifica... | Decimal | 111 | UINT16 | |
| b2-01 | User-defined OFF1 | | - | 0 | 10 | 0 | Free mod... | Decimal | 112 | UINT16 | |
| b2-02 | User-defined OFF2 so... | 1[Disable] | - | 0 | 10 | 1 | Free mod... | Decimal | 117 | UINT16 | |
| b2-03 | User-defined OFF3 so... | 1[Disable] | - | 0 | 10 | 1 | Free mod... | Decimal | 120 | UINT16 | |
| b2-04 | User-defined operati... | 1[Permit] | - | 0 | 10 | 1 | Free mod... | Decimal | 113 | UINT16 | |
| b2-05 | User-defined fault r... | 0[Disable] | - | 0 | 10 | 0 | Free mod... | Decimal | 123 | UINT16 | |
| b2-06 | User-defined JOG1 so... | 0[Disable] | - | 0 | 10 | 0 | Free mod... | Decimal | 115 | UINT16 | |
| b2-07 | User-defined JOG2 so... | 0[Disable] | - | 0 | 10 | 0 | Free mod... | Decimal | 116 | UINT16 | |
| b2-08 | User-defined speed i... | 0[Disable] | - | 0 | 10 | 0 | Free mod... | Decimal | 114 | UINT16 | |

Figure 6-23 Adding to the monitoring list

The parameter monitoring list displays the name, description, current value, control value, show type, unit, minimum value, maximum value, default value, and modification mode of parameters monitored The name displayed in the list indicates “Drive object.parameter ID”.

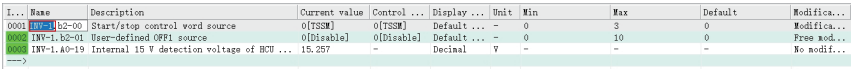
You can select a drive object in the monitoring list. Different drive objects have different monitored parameters. Also, you can select all drive objects in the monitoring list to view all monitored parameters.



| I... | Name | Description | Current value | Control ... | Display ... | Unit | Min | Max | Default | Modifica... |
|---|---|---|---|---|---|---|---|---|---|---|
| 0001 | INV-1.b2-00 | Start/stop control word source | 0[TSSM] | 0[TSSM] | Default ... | - | 0 | 3 | 0 | Modifica... |
| 0002 | INV-1.b2-01 | User-defined OFF1 source | 0[Disable] | 0[Disable] | Default ... | - | 0 | 10 | 0 | Free mod... |
| 0003 | INV-1.A0-19 | Internal 15 V detection voltage of HCU ... | 15.257 | - | Decimal | V | - | - | - | No modif... |
| ---> | | | | | | | | | | |

Figure 6-24 Parameter monitoring list

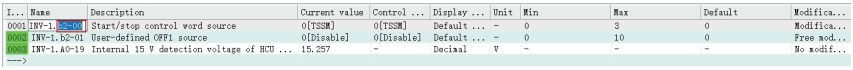
Modify the drive object in the parameter name to change the drive object of the monitored parameter.



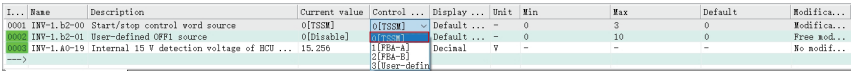
| I... | Name | Description | Current value | Control ... | Display ... | Unit | Min | Max | Default | Modifica... |
|---|---|---|---|---|---|---|---|---|---|---|
| 0001 | INV-1.b2-00 | Start/stop control word source | 0[TSSM] | 0[TSSM] | Default ... | - | 0 | 3 | 0 | Modifica... |
| 0002 | INV-1.b2-01 | User-defined OFF1 source | 0[Disable] | 0[Disable] | Default ... | - | 0 | 10 | 0 | Free mod... |
| 0003 | INV-1.A0-19 | Internal 15 V detection voltage of HCU ... | 15.257 | - | Decimal | V | - | - | - | No modif... |
| ---> | | | | | | | | | | |

Figure 6-25 Modifying the drive object of the monitored parameter

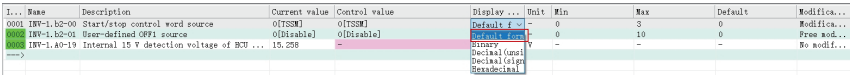
Modify the parameter ID in the parameter name to modify the monitored parameter of specific drive object.




- If the modification mode of the monitored parameter is “Free modification”, the control value of the parameter can be modified.
- If the modification mode of the monitored parameter is “Modification at stop”, the control value of the parameter can be modified only in the stop state.
- If the modification mode of the monitored parameter is “No modification”, the control value of the parameter cannot be modified.




Some monitored parameters can be displayed in multiple formats. You can select different display formats by clicking “Display format”.




Click  in the parameter monitoring list to create a temporary monitoring list. Parameters added to the monitoring list will be displayed in the current temporary monitoring table.

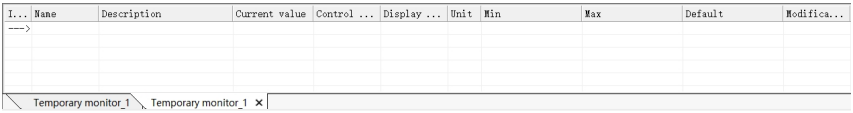



Figure 6-26 Creating a temporary monitoring list

Click in the parameter monitoring list to open a saved parameter monitoring list.

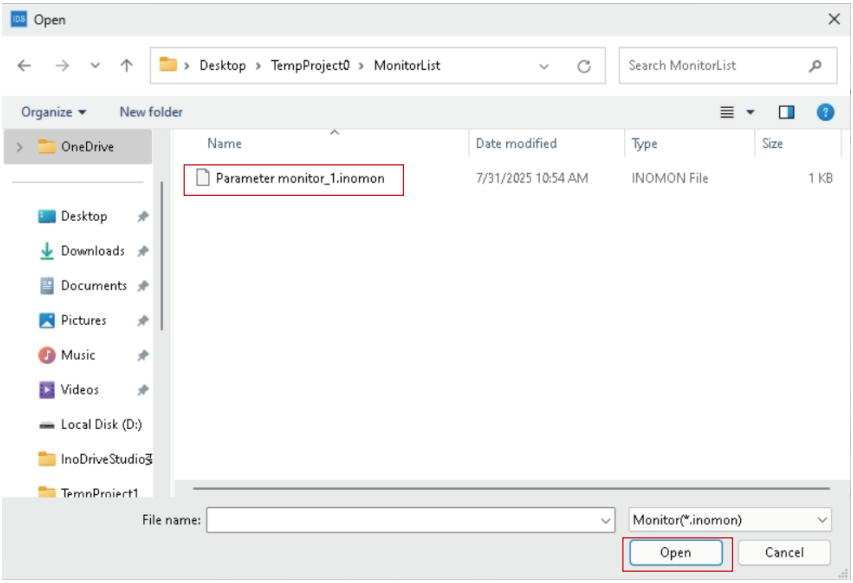



Figure 6-27 Opening the parameter monitoring list

Click  to display the “Save as” page. Set the directory for saving the file and the file name. The save type of the file must be *.inomon.

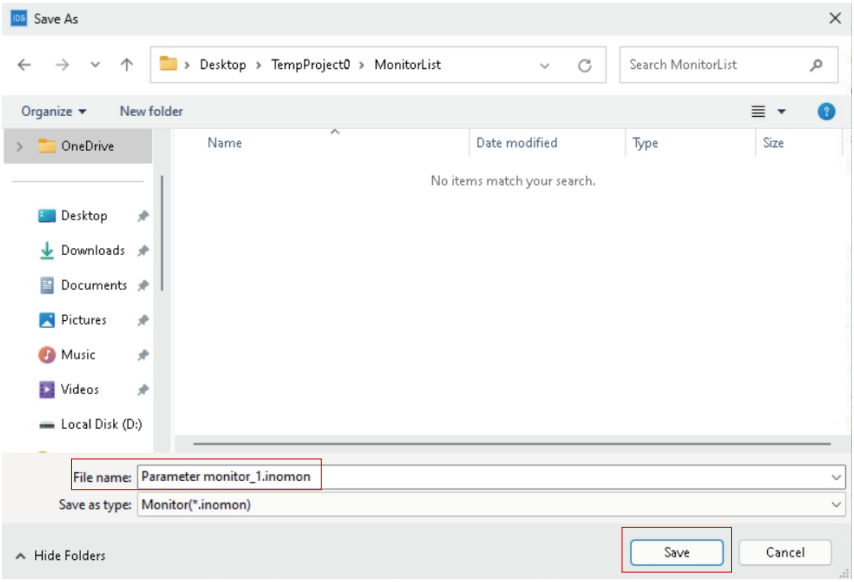



Figure 6-28 Storing the parameter monitoring list

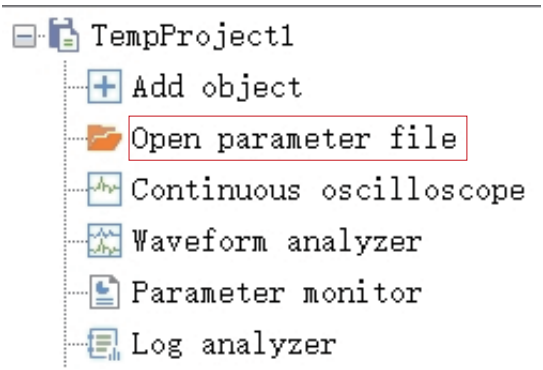
To monitor a specific group of parameters during development, add the parameters to the parameter monitoring list and save the parameter monitoring list. Open the parameter monitoring list when needed.

### 6.2.9 Parameter File

When saving the parameter file, save the current parameter group as a file. If the current parameter group contains all parameters, all parameters are saved. If the current parameter group is group b, all parameters in group b are saved. If it is group b4, all parameters in group b4 are saved. When saving a file, you can select the following file types.

- Parameter file (*.inoprm): The “Save as” files support parameter download. The parameter values in the file can be downloaded to other device.
- Parameter group file (*.inogrp): The “Save as” file is the parameter configuration file that only contains parameter group information, which can be re-loaded to the custom group.
- CSV file (*.csv): The “Save as” file can be opened and viewed directly only for Inovance staff.
- xlsx file (*.xlsx): The “Save as” file can be opened and viewed directly only for Inovance staff.

Double-click “Open parameter file” in the Workspace pane to display the dialog box.




Then, select the parameter file to be opened.

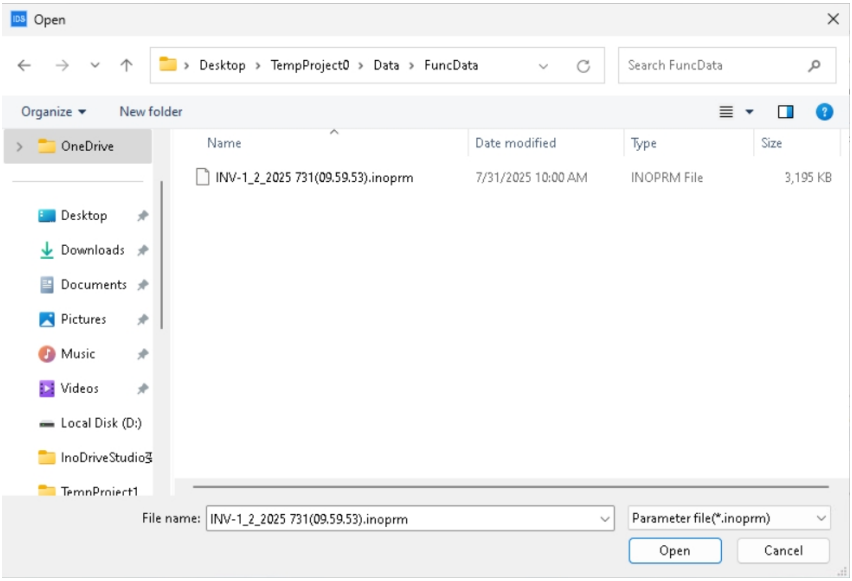
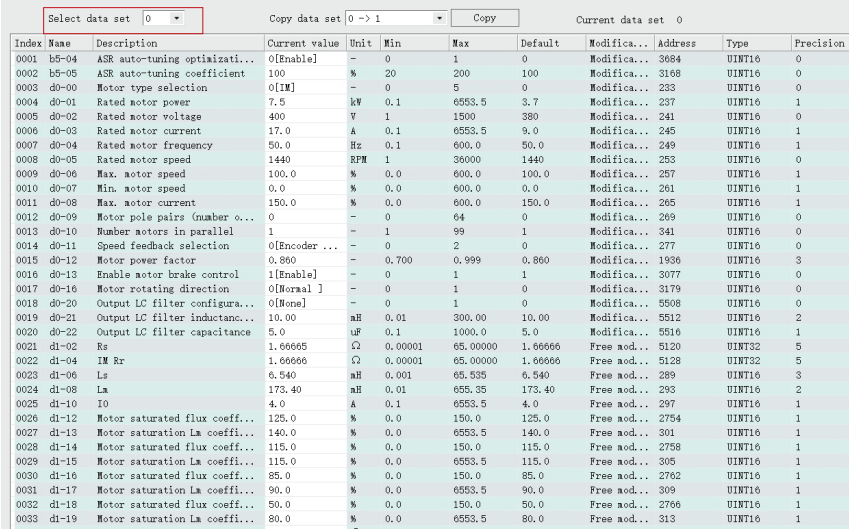



Figure 6-29 Opening the parameter file

## 6.3 Motor Data Set

The MD880 and MD580 control modules can store a maximum of four different motor data sets. Each set contains motor parameters and corresponding motor control parameters. For example, for a MD880 inverter, go to “Parameter list > Motor data set” to open the motor data set page. All parameters related to motor switchover are displayed in the list, as shown in the following figure. When another motor is selected in “Select data set”, parameters in the list are switched to those of the selected motor.

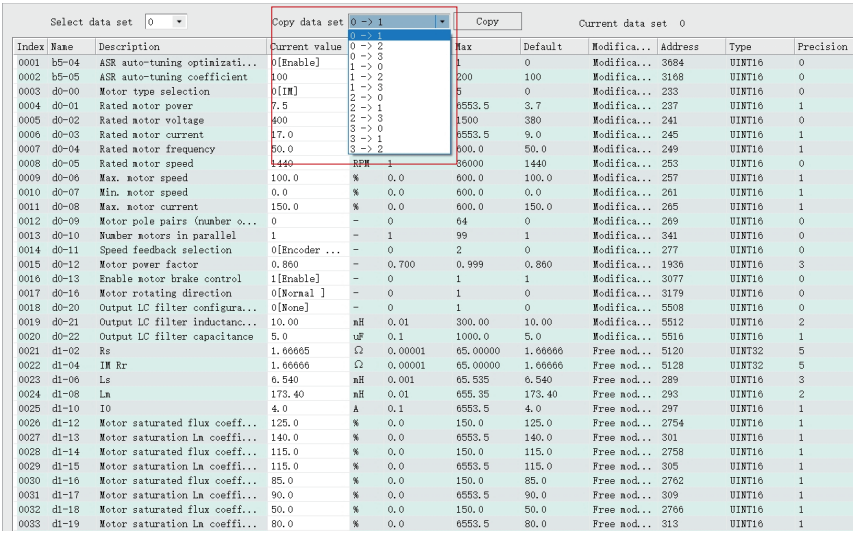


Select data set 0 | Copy data set 0 -> 1 | Copy | Current data set 0

| Index | Name | Description | Current value | Unit | Min | Max | Default | Modifica... | Address | Type | Precision |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0001 | b5-04 | ASR auto-tuning optimizati... | 0[Enable] | - | 0 | 1 | 0 | Modifica... | 3684 | UINT16 | 0 |
| 0002 | b5-05 | ASR auto-tuning coefficient | 100 | % | 20 | 200 | 100 | Modifica... | 3168 | UINT16 | 0 |
| 0003 | d0-00 | Motor type selection | 0[IM] | - | 0 | 5 | 0 | Modifica... | 233 | UINT16 | 0 |
| 0004 | d0-01 | Rated motor power | 7.5 | kW | 0.1 | 6553.5 | 3.7 | Modifica... | 237 | UINT16 | 1 |
| 0005 | d0-02 | Rated motor voltage | 400 | V | 1 | 1500 | 380 | Modifica... | 241 | UINT16 | 0 |
| 0006 | d0-03 | Rated motor current | 17.0 | A | 0.1 | 6553.5 | 9.0 | Modifica... | 245 | UINT16 | 1 |
| 0007 | d0-04 | Rated motor frequency | 50.0 | Hz | 0.1 | 600.0 | 50.0 | Modifica... | 249 | UINT16 | 1 |
| 0008 | d0-05 | Rated motor speed | 1440 | RPM | 1 | 36000 | 1440 | Modifica... | 253 | UINT16 | 0 |
| 0009 | d0-06 | Max. motor speed | 100.0 | % | 0.0 | 600.0 | 100.0 | Modifica... | 257 | UINT16 | 1 |
| 0010 | d0-07 | Min. motor speed | 0.0 | % | 0.0 | 600.0 | 0.0 | Modifica... | 261 | UINT16 | 1 |
| 0011 | d0-08 | Max. motor current | 150.0 | % | 0.0 | 600.0 | 150.0 | Modifica... | 265 | UINT16 | 1 |
| 0012 | d0-09 | Motor pole pairs (number o... | 0 | - | 0 | 64 | 0 | Modifica... | 269 | UINT16 | 0 |
| 0013 | d0-10 | Number motors in parallel | 1 | - | 1 | 99 | 1 | Modifica... | 341 | UINT16 | 0 |
| 0014 | d0-11 | Speed feedback selection | 0[Encoder ... | - | 0 | 2 | 0 | Modifica... | 277 | UINT16 | 0 |
| 0015 | d0-12 | Motor power factor | 0.860 | - | 0.700 | 0.999 | 0.860 | Modifica... | 1936 | UINT16 | 3 |
| 0016 | d0-13 | Enable motor brake control | 1[Enable] | - | 0 | 1 | 1 | Modifica... | 3077 | UINT16 | 0 |
| 0017 | d0-16 | Motor rotating direction | 0[Normal ] | - | 0 | 1 | 0 | Modifica... | 3179 | UINT16 | 0 |
| 0018 | d0-20 | Output LC filter configura... | 0[None] | - | 0 | 1 | 0 | Modifica... | 5508 | UINT16 | 0 |
| 0019 | d0-21 | Output LC filter inductanc... | 10.00 | mH | 0.01 | 300.00 | 10.00 | Modifica... | 5512 | UINT16 | 2 |
| 0020 | d0-22 | Output LC filter capacitance | 5.0 | uF | 0.1 | 1000.0 | 5.0 | Modifica... | 5516 | UINT16 | 1 |
| 0021 | d1-02 | Rs | 1.66665 | Ω | 0.00001 | 65.00000 | 1.66666 | Free mod... | 5120 | UINT32 | 5 |
| 0022 | d1-04 | IM Rr | 1.66666 | Ω | 0.00001 | 65.00000 | 1.66666 | Free mod... | 5128 | UINT32 | 5 |
| 0023 | d1-06 | Ls | 6.540 | mH | 0.001 | 65.535 | 6.540 | Free mod... | 289 | UINT16 | 3 |
| 0024 | d1-08 | Lm | 173.40 | mH | 0.01 | 655.35 | 173.40 | Free mod... | 293 | UINT16 | 2 |
| 0025 | d1-10 | I0 | 4.0 | A | 0.1 | 6553.5 | 4.0 | Free mod... | 297 | UINT16 | 1 |
| 0026 | d1-12 | Motor saturated flux coeff... | 125.0 | % | 0.0 | 150.0 | 125.0 | Free mod... | 2754 | UINT16 | 1 |
| 0027 | d1-13 | Motor saturation Lm coeffi... | 140.0 | % | 0.0 | 6553.5 | 140.0 | Free mod... | 301 | UINT16 | 1 |
| 0028 | d1-14 | Motor saturated flux coeff... | 115.0 | % | 0.0 | 150.0 | 115.0 | Free mod... | 2758 | UINT16 | 1 |
| 0029 | d1-15 | Motor saturation Lm coeffi... | 115.0 | % | 0.0 | 6553.5 | 115.0 | Free mod... | 305 | UINT16 | 1 |
| 0030 | d1-16 | Motor saturated flux coeff... | 85.0 | % | 0.0 | 150.0 | 85.0 | Free mod... | 2762 | UINT16 | 1 |
| 0031 | d1-17 | Motor saturation Lm coeffi... | 90.0 | % | 0.0 | 6553.5 | 90.0 | Free mod... | 309 | UINT16 | 1 |
| 0032 | d1-18 | Motor saturated flux coeff... | 50.0 | % | 0.0 | 150.0 | 50.0 | Free mod... | 2766 | UINT16 | 1 |
| 0033 | d1-19 | Motor saturation Lm coeffi... | 80.0 | % | 0.0 | 6553.5 | 80.0 | Free mod... | 313 | UINT16 | 1 |

Figure 6-30 Motor parameter

To have two same sets of motor parameters, select the desired mode in “Copy data set”, and click “Copy”, as shown in the following figure.



Select data set 0 | Copy data set 0 -> 1 | Copy | Current data set 0

0 -> 1
0 -> 2
0 -> 3
1 -> 0
1 -> 2
1 -> 3
2 -> 0
2 -> 1
2 -> 3
3 -> 0
3 -> 1
3 -> 2

| Index | Name | Description | Current value | Unit | Min | Max | Default | Modifica... | Address | Type | Precision |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0001 | b5-04 | ASR auto-tuning optimizati... | 0[Enable] | - | 0 | 1 | 0 | Modifica... | 3684 | UINT16 | 0 |
| 0002 | b5-05 | ASR auto-tuning coefficient | 100 | % | 20 | 200 | 100 | Modifica... | 3168 | UINT16 | 0 |
| 0003 | d0-00 | Motor type selection | 0[IM] | - | 0 | 5 | 0 | Modifica... | 233 | UINT16 | 0 |
| 0004 | d0-01 | Rated motor power | 7.5 | kW | 0.1 | 6553.5 | 3.7 | Modifica... | 237 | UINT16 | 1 |
| 0005 | d0-02 | Rated motor voltage | 400 | V | 1 | 1500 | 380 | Modifica... | 241 | UINT16 | 0 |
| 0006 | d0-03 | Rated motor current | 17.0 | A | 0.1 | 6553.5 | 9.0 | Modifica... | 245 | UINT16 | 1 |
| 0007 | d0-04 | Rated motor frequency | 50.0 | Hz | 0.1 | 600.0 | 50.0 | Modifica... | 249 | UINT16 | 1 |
| 0008 | d0-05 | Rated motor speed | 1440 | RPM | 1 | 36000 | 1440 | Modifica... | 253 | UINT16 | 0 |
| 0009 | d0-06 | Max. motor speed | 100.0 | % | 0.0 | 600.0 | 100.0 | Modifica... | 257 | UINT16 | 1 |
| 0010 | d0-07 | Min. motor speed | 0.0 | % | 0.0 | 600.0 | 0.0 | Modifica... | 261 | UINT16 | 1 |
| 0011 | d0-08 | Max. motor current | 150.0 | % | 0.0 | 600.0 | 150.0 | Modifica... | 265 | UINT16 | 1 |
| 0012 | d0-09 | Motor pole pairs (number o... | 0 | - | 0 | 64 | 0 | Modifica... | 269 | UINT16 | 0 |
| 0013 | d0-10 | Number motors in parallel | 1 | - | 1 | 99 | 1 | Modifica... | 341 | UINT16 | 0 |
| 0014 | d0-11 | Speed feedback selection | 0[Encoder ... | - | 0 | 2 | 0 | Modifica... | 277 | UINT16 | 0 |
| 0015 | d0-12 | Motor power factor | 0.860 | - | 0.700 | 0.999 | 0.860 | Modifica... | 1936 | UINT16 | 3 |
| 0016 | d0-13 | Enable motor brake control | 1[Enable] | - | 0 | 1 | 1 | Modifica... | 3077 | UINT16 | 0 |
| 0017 | d0-16 | Motor rotating direction | 0[Normal ] | - | 0 | 1 | 0 | Modifica... | 3179 | UINT16 | 0 |
| 0018 | d0-20 | Output LC filter configura... | 0[None] | - | 0 | 1 | 0 | Modifica... | 5508 | UINT16 | 0 |
| 0019 | d0-21 | Output LC filter inductanc... | 10.00 | mH | 0.01 | 300.00 | 10.00 | Modifica... | 5512 | UINT16 | 2 |
| 0020 | d0-22 | Output LC filter capacitance | 5.0 | uF | 0.1 | 1000.0 | 5.0 | Modifica... | 5516 | UINT16 | 1 |
| 0021 | d1-02 | Rs | 1.66665 | Ω | 0.00001 | 65.00000 | 1.66666 | Free mod... | 5120 | UINT32 | 5 |
| 0022 | d1-04 | IM Rr | 1.66666 | Ω | 0.00001 | 65.00000 | 1.66666 | Free mod... | 5128 | UINT32 | 5 |
| 0023 | d1-06 | Ls | 6.540 | mH | 0.001 | 65.535 | 6.540 | Free mod... | 289 | UINT16 | 3 |
| 0024 | d1-08 | Lm | 173.40 | mH | 0.01 | 655.35 | 173.40 | Free mod... | 293 | UINT16 | 2 |
| 0025 | d1-10 | I0 | 4.0 | A | 0.1 | 6553.5 | 4.0 | Free mod... | 297 | UINT16 | 1 |
| 0026 | d1-12 | Motor saturated flux coeff... | 125.0 | % | 0.0 | 150.0 | 125.0 | Free mod... | 2754 | UINT16 | 1 |
| 0027 | d1-13 | Motor saturation Lm coeffi... | 140.0 | % | 0.0 | 6553.5 | 140.0 | Free mod... | 301 | UINT16 | 1 |
| 0028 | d1-14 | Motor saturated flux coeff... | 115.0 | % | 0.0 | 150.0 | 115.0 | Free mod... | 2758 | UINT16 | 1 |
| 0029 | d1-15 | Motor saturation Lm coeffi... | 115.0 | % | 0.0 | 6553.5 | 115.0 | Free mod... | 305 | UINT16 | 1 |
| 0030 | d1-16 | Motor saturated flux coeff... | 85.0 | % | 0.0 | 150.0 | 85.0 | Free mod... | 2762 | UINT16 | 1 |
| 0031 | d1-17 | Motor saturation Lm coeffi... | 90.0 | % | 0.0 | 6553.5 | 90.0 | Free mod... | 309 | UINT16 | 1 |
| 0032 | d1-18 | Motor saturated flux coeff... | 50.0 | % | 0.0 | 150.0 | 50.0 | Free mod... | 2766 | UINT16 | 1 |
| 0033 | d1-19 | Motor saturation Lm coeffi... | 80.0 | % | 0.0 | 6553.5 | 80.0 | Free mod... | 313 | UINT16 | 1 |

Figure 6-31 Copying motor data set

## 6.4 Configuring the Drive Object

Choose “Config > Drive config” to access the drive configuration interface. Take the MD880 standard inverter as an example. The drive configuration interface supports the following functions.

1. You can call the device in the drive configuration interface, as shown in the following figure.

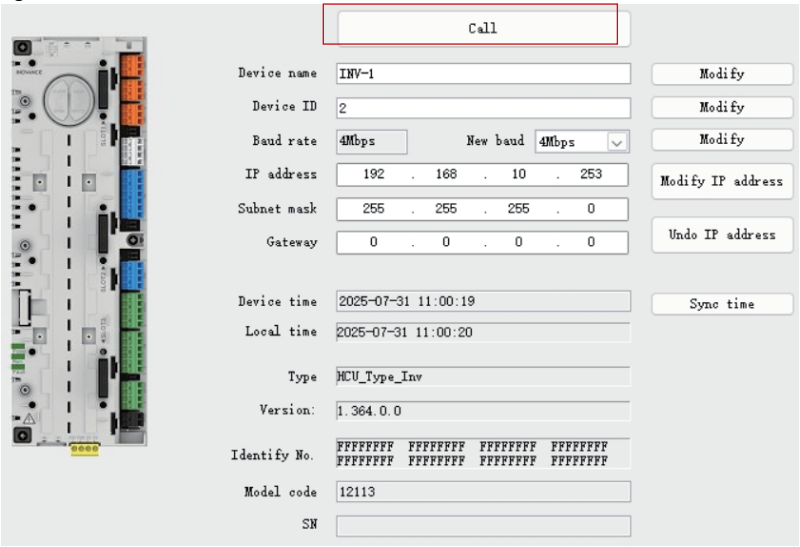



Figure 6-32 Calling the device

The RUN and FAULT indicators at the bottom left corner of the device keep flashing.




Figure 6-33 Status indicators of the device

2. Modify the device name directly in the drive configuration interface, as shown in the following figure.

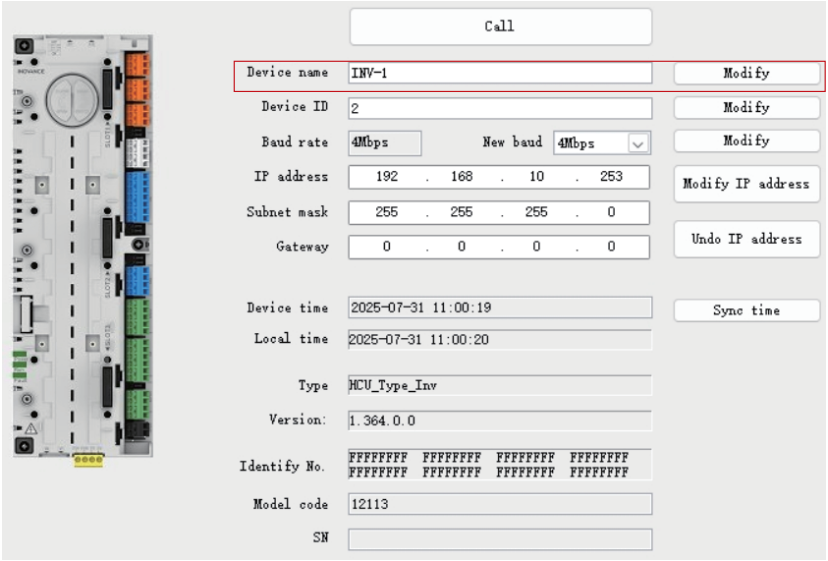



Figure 6-34 Modifying the device name

3. Modify the device ID and baud rate directly in the drive configuration interface, as shown in the following figure. The device ID and baud rate correspond to A10-03 (SOP-20/

repeater communication address) and A10-04 (SOP-20/repeater communication rate) respectively.

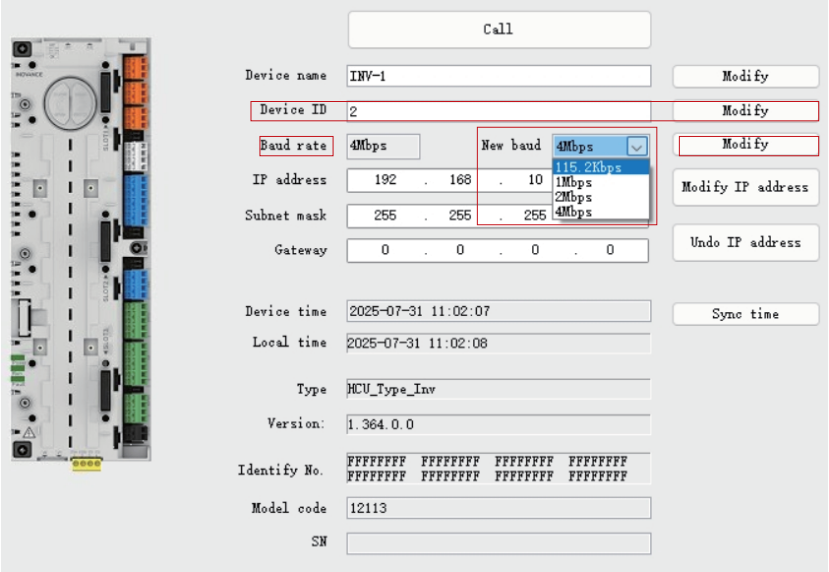



Figure 6-35 Modifying the device ID and baud rate

4. You can directly change the IP address, subnet mask, and gateway of the device in the drive configuration interface. If the input IP address, subnet mask, and gateway are incorrect and “Modify IP address” is not selected, click “Undo IP address” to restore them. The IP address, subnet mask, and gateway correspond to n13-03 to n13-14 in the Ethernet parameter group respectively.

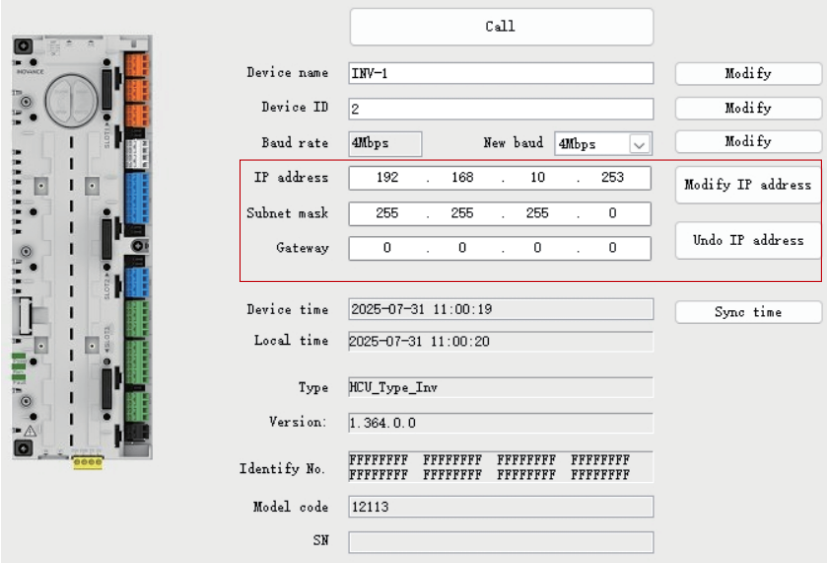



Figure 6-36 Modifying the device IP

5. View the system time (object time) and PC time (local time) in the drive configuration interface, and click "Sync time" to synchronize the PC time to the controller.

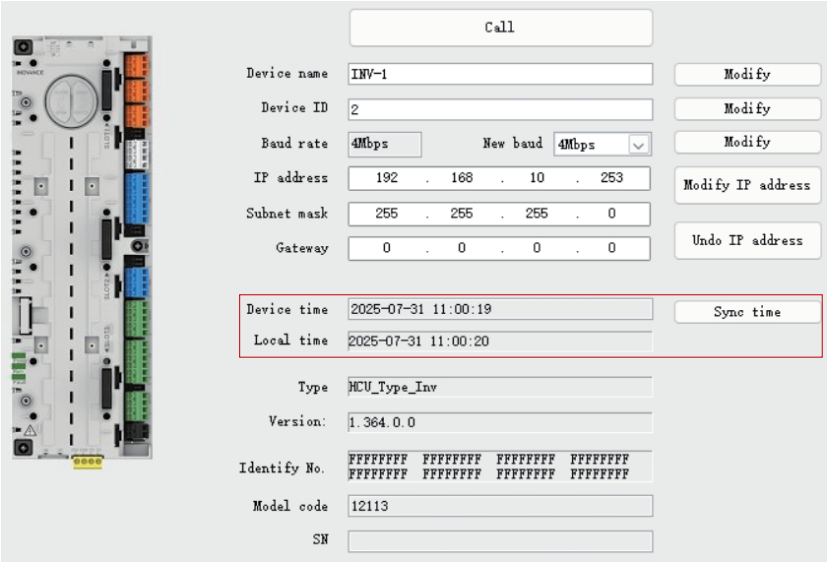



Figure 6-37 Modifying the device time

## 6.5 Process Data Configuration

1. Choose "Config > Process data config" to access the process data configuration interface, as shown in the following figure.

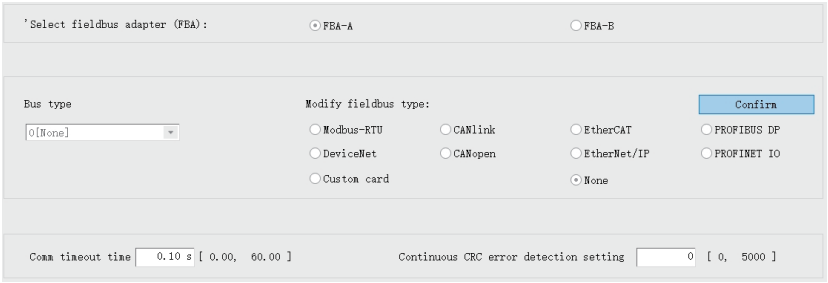



Figure 6-38 Process data configuration page

2. You can select bus adapter A or bus adapter B as the fieldbus adapter. The corresponding bus type, communication timeout time, and continuous CRC error detection setting are displayed on the lower part of the page.




Figure 6-39 Fieldbus adapter

3. Select the bus type of the bus adapter. Select the bus type as needed under “Modify fieldbus type”, and click “Confirm”. The selected bus type is displayed in the drop-down box of “Bus type” on the left.

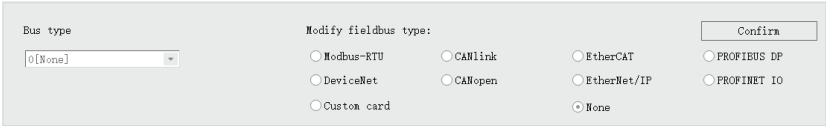



Figure 6-40 Modifying fieldbus type

4. The communication timeout time of the bus adapter can be set from 0.00s to 60.00s. An alarm is reported if the set communication timeout time is exceeded.

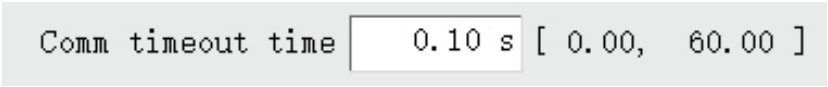



Figure 6-41 Communication timeout time

5. The number of communication CRC check errors of the bus adapter can be set from 0 to 5000. When it is set to 0, the setting is not active. If actual number of communication CRC check errors exceeds the setpoint, a CRC error is triggered in the data received or transmitted.

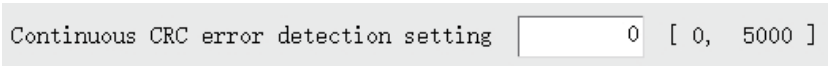



Figure 6-42 Continuous CRC error detection setting

## 6.6 Waveform Recording and Analysis

### 6.6.1 Overview

Real-time analysis of data curves is key for commissioning performance. InoDriveStudio provides continuous oscilloscope, waveform analyzer, trigger oscilloscope, and black box for online real-time recording of data curves, conditional recording of data curves, and offline view of waveforms.

### 6.6.2 Continuous Oscilloscope

The operation status of the equipment needs to be monitored in real time during on-site commissioning. The continuous oscilloscopes in InoDriveStudio can be used to monitor and record relevant data or status of the equipment in real time. Click “Continuous oscilloscope” in the Workspace pane to open the oscilloscope. The oscilloscope consists of the channel selection area, waveform display area, waveform configuration area, and toolbar, as shown in the following figure.

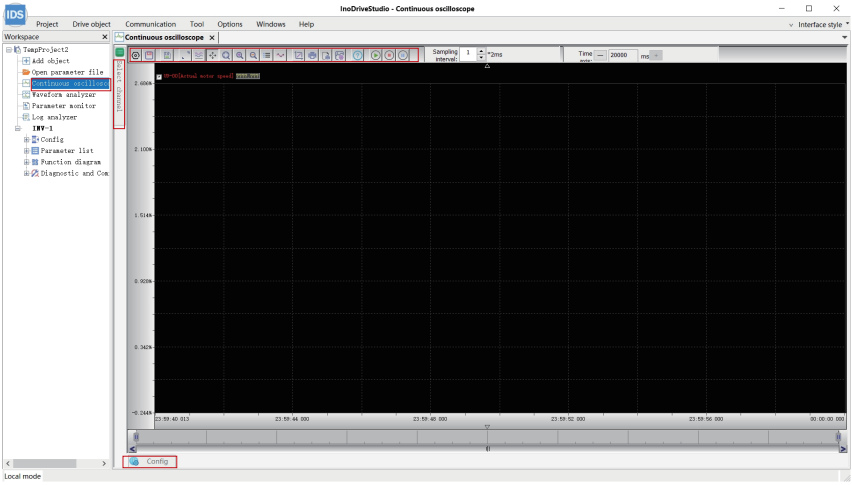



Figure 6-43 Continuous oscilloscope interface

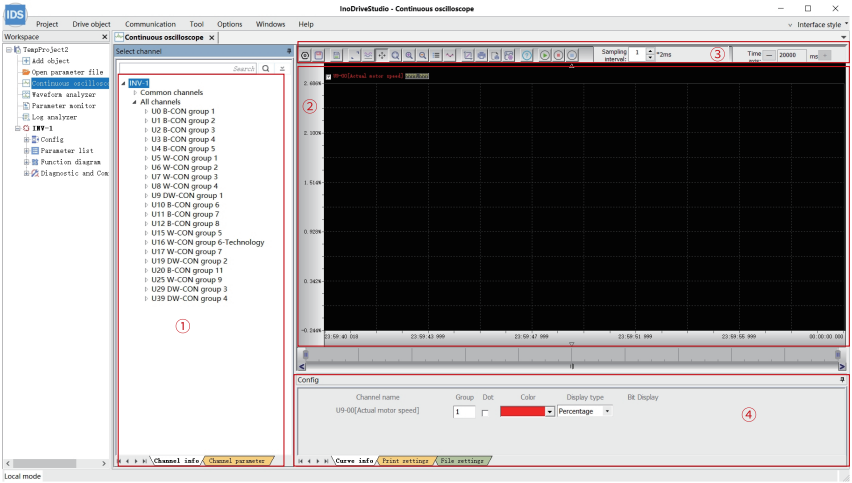



Figure 6-44 Continuous oscilloscope area

Only one continuous oscilloscope can be opened for each project. The oscilloscope is used to record and analyze waveform of all equipment in the current project.

Table 6–3 Descriptions of continuous oscilloscope interface

| No. | Name | Function description |
|---|---|---|
| ① | Channel selection | - |
| ② | Main screen for waveform display | - |
| ③ | Toolbar | You can start, stop, pause, and zoom in/out the toolbar. To delete the selected channel, click the Stop button and then select “Channel parameter”. |
| ④ | Waveform configuration | Set the group number to the same value to show the connectors with the same physical meanings in the same coordinate system. |

- In the “Select channel” pane, customize the data channel to be monitored from “Common channels” and “All channels”. The common channels are channels selected from “All channels” and commonly used for oscilloscope monitoring, which allows users to select the channel directly from the list. The common channels are supported by the following devices.
  - Engineering Drive[MD580 Series]/MD580S-INV
  - Engineering Drive[MD880 SG(E0)]/HCU_Type_Inv
  - Engineering Drive[MD880 HS(E1)]/HCU_Type_Inv_HS
  - Engineering Drive[MD880 SG(E0)]/HCU_Type_AFE

- Engineering Drive[MD880 SG(E0)]/HCU_Type_SMART
- Engineering Drive[MD880 SG(E0)]/HCU_Type_T2
- Engineering Drive[MD880 SG(E0)]/HCU_Type_DC-DC
- Engineering Drive[MD880 SG Series]/HCU_Type_AFE
- Engineering Drive[MD880 SG Series]/HCU_Type_SMART
- Engineering Drive[MD880 SG Series]/HCU_Type_T2
- Engineering Drive[MD880 SG Series]/HCU_Type_DC-DC

All channels consists of all parameters in group U which can be used as the data source to record curves. The parameters in group U can be classified into:

- A single word connector is of 16-bit data, with each data occupying one recording channel.
- A double word connector is of 32-bit data. Single-word recording is used by default, with each data occupying one recording channel. If you want to obtain more accurate waveform, you can modify the configuration to double-word recording in “Channel parameter”, with each data occupying two recording channels.
- Bit connectors are digital values. Up to eight digital values in one device can be recorded. All digital waveforms in a device only occupy one recording channel. The number of channels is related to the communication baud rate and sampling interval, as shown in the following table:

Table 6–4 Baud rate and sampling interval related to quantity of channels

| Baud rate | Sampling interval | Max. number of channels | Sampling interval | Max. number of channels | Sampling interval | Max. number of channels |
|---|---|---|---|---|---|---|
| 115200bps | 2 ms | 4 | 4 ms | 7 | 4 ms | 8 |
| 1Mbps | 2 ms | 8 | 4 ms | 8 | 4 ms | 8 |
| 2Mbps | 2 ms | 8 | 4 ms | 8 | 4 ms | 8 |
| 4Mbps | 2 ms | 8 | 4 ms | 8 | 4 ms | 8 |

In the lower part of the “Select channel” pane, click the “Channel info” tab to select a device and configure the oscilloscope channel for the device. Click the “Channel parameter” tab to show the current and configured oscilloscope channels. You can also select the recording accuracy of the double word connector. (Select DWord to perform 32-bit recording which occupies two oscilloscope channels. Select Word to perform 16-bit recording which occupies one oscilloscope channel.)

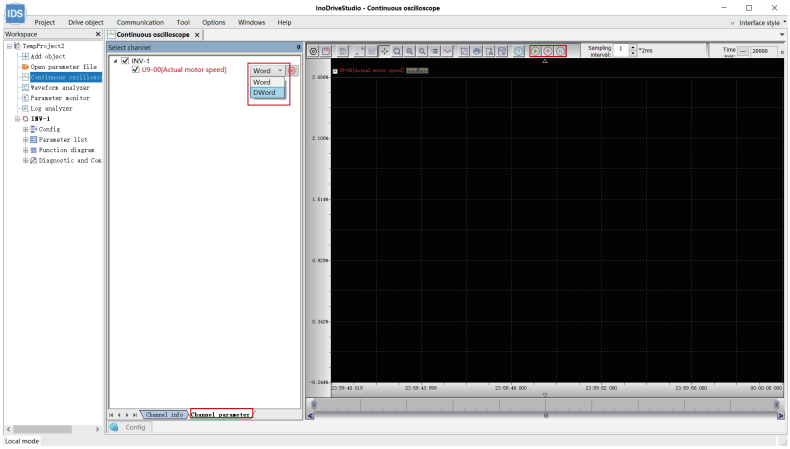



Figure 6-45 Word and double word switchover, double word connector of continuous oscilloscope

Click  to delete the channels on the “Channel parameter” interface.

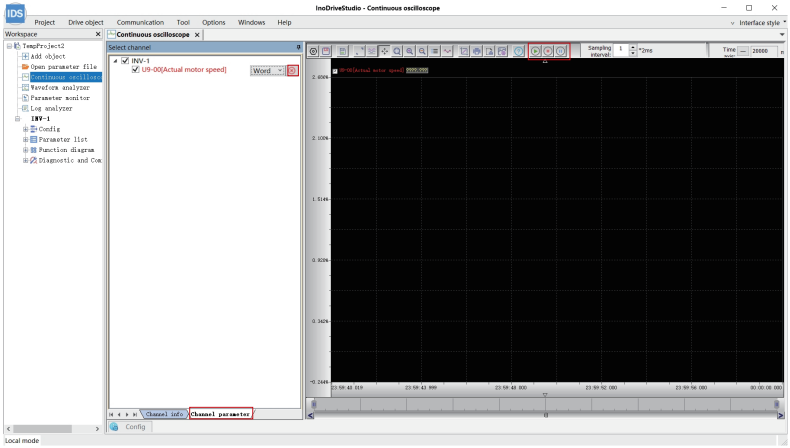



Figure 6-46 Deleting channels from the continuous oscilloscope

## *Note*

You can delete the channel and switch the recording accuracy of the double word connector channel only when the continuous oscilloscope stops recording.

- The waveform display area supports up to eight curves simultaneously. You can switch the curves for display through channel parameters. Descriptions of common shortcut keys in the waveform display area

Table 6–5 Common shortcut keys in the waveform display area

| Shortcut key | Function description |
|---|---|
| Right button of the mouse | Click the right button of the mouse to scale the coordinates of all curves. |
| Mouse wheel | Used to zoom in or out the curve. In the waveform area, the mouse wheel can be used to zoom in or out the coordinates. In the coordinate area, the mouse wheel can be used only to zoom in or out the current coordinate.<br>When the y-coordinate range of the current curve changes, the timeline of all curves changes simultaneously. |
| Ctrl+mouse wheel | Used to pan the curve. In the waveform area, pressing the Ctrl key+mouse wheel can be used to pan the coordinates. In the coordinate area, pressing the Ctrl key+mouse wheel can be used only to pan the current coordinate.<br>When the y-coordinate range of the current curve changes, the timeline of all curves changes simultaneously. |
| Up and down arrows (↑ ↓) | Used to pan the current curve up and down. |
| Alt | Used to perform operations on all curves forcibly. For example, pressing the Alt key+up arrow can move all curves up. |
| Shift | Used to force the operation to zooming. For example, pressing the Shift key+up/down arrows ((↑ ↓) can zoom in or out the y-coordinate of the current curve. |
| Ctrl | Used to force the operation to panning. For example, pressing the Ctrl key+mouse wheel can translate the curve. |

- The waveform configuration area contains three sub-interfaces, including curve information, print settings, and file settings. You can view the basic information of the waveform file or the sampling time of the waveform channel in the curve information sub-interface. You can also configure a same group number in the curve information sub-interface to achieve simultaneous scaling of multiple curves.
  Configure the color of each waveform curve in the curve information sub-interface. After you check the curve point, each sampling point of the curve is displayed in bold. When the group numbers of the two curves are set to the same value, these two curves share the same set of y-coordinate, which will be zoomed simultaneously. The display type of certain signals can be changed. For example, the speed can be displayed as a per unit value by percentage, frequency, or speed unit. If the display type of a signal is set to bit, you can view the bit value of the signal.

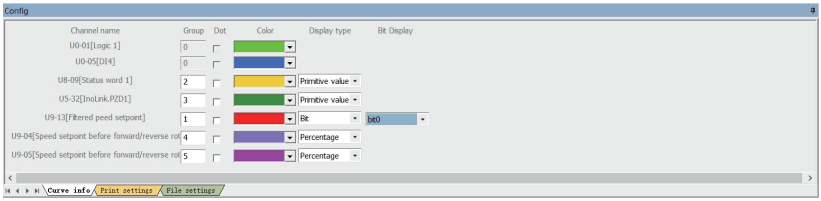
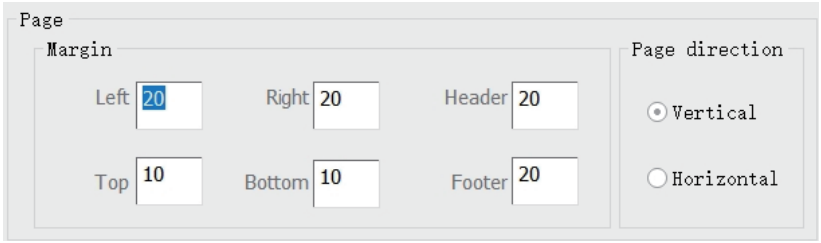
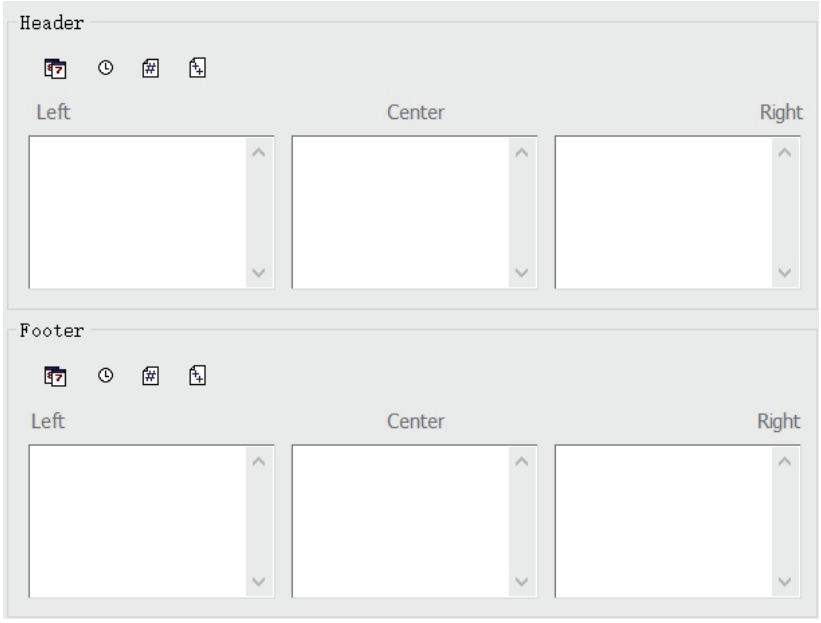



Figure 6-47 Waveform configuration area

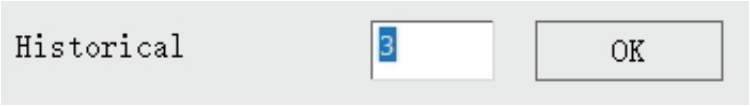
In the Print settings sub-interface, set parameters related to page printing, such as page margins and orientation.




Click in the edit box of the header and foot. Then, click , , , and in sequence to display and edit the header/footer date, time, page number, and total page count.



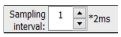

You can set the size of historical waveforms in the File settings sub-interface.




- Functions of the buttons on the menu bar:

Table 6–6 Toolbar options of continuous oscilloscope

| Button | Function |
|---|---|
|  | Used to open the saved configuration file which indicates channel parameters of the oscilloscope. |
|  | Used to save the current configuration file which indicates current channel parameter. |
|  | Used to save the waveform. To save the currently recorded waveform to a continuous data file (*.inocwv), select “All waveforms” or “Current window waveforms”. You can save the file in *.csv format to easily open it with Excel for analysis. In addition, the waveform file is automatically saved every 10 minutes in the engineering directory /Data/WaveData/Auto/. |
|  | Used to scale the y-coordinate. Used to scale the y-coordinate of all curves based on the displayed value to ensure that all curve points are displayed. |
|  | Used to separate multiple waveforms that are superposed. |
|  | Translate button Used to translate the current curve by the left mouse button. |
|  | Zoom-out selection button Used to select a section of the window to zoom in/out on the waveform. |
|  | Zoom-out button Used to zoom in or out. When the y-coordinate range of the current curve changes, the timeline of all curves changes simultaneously. |
|  | Used to show or hide the cursor. Measurement of curve data can be achieved using two cursors. |
|  | Used to determine whether to display the sampling point. |

| Button | Function |
| --- | --- |
|  | Click this button to take a screenshot. |
|  | Used to print the current waveform. |
|  | Print preview |
|  | Used to set the background of the continuous oscilloscope. |
|  | Click the button to display the help manual of the continuous oscilloscope. |
|  | Start button; Click the button to start recording the waveform. |
|  | Stop button; Click the button to stop recording the waveform. |
|  | Pause button; Click the button to pause waveform recording. |
|   | Sampling interval; Indicates the sampling interval. |
|   | Timeline |

## 6.6.3 Trigger Oscilloscope

You can use trigger oscilloscope function when waveform recording must be triggered upon alarms, faults, and other conditions. To use trigger oscilloscope, do as follows:

1. Open the trigger oscilloscope interface.
   Choose “Diagnostic and Commissioning > Diagnostic > Trigger oscilloscope” to enable the trigger oscilloscope.

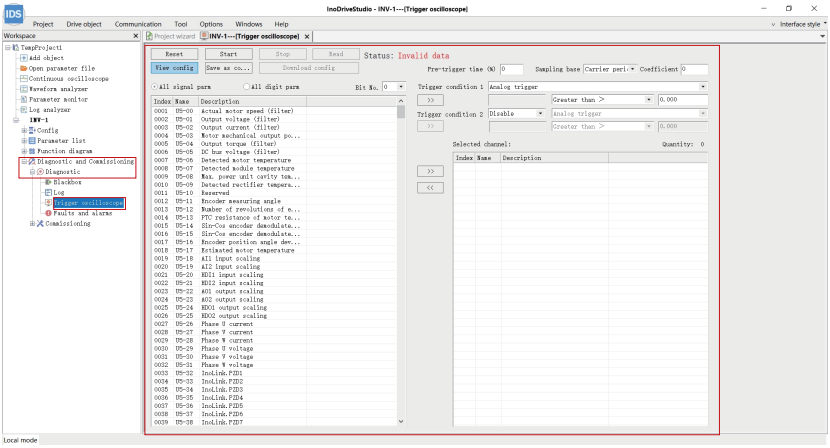


Figure 6-48 Trigger oscilloscope

2. Select the parameters as needed.
   The parameters can be classified into signal parameters and digital parameters. Select the parameter to be read and click to add it to the selected channel on the right.

   You can also double-click the selected parameter to directly add it to the “Selected channel”. To remove a parameter from the selected channel, double-click the parameter to be removed or select the parameter and click .

3. Perform the trigger settings.
   The trigger settings include:

   - Sampling base value, which can be set to “Carrier period” or a multiple of 2 ms (including 2 ms).
   - Pre-trigger time, which indicates the time when the trigger is about to get started. When it is set to 50%, the triggered waveform is recorded in the middle of the entire waveform timeline for storage.
   - Trigger condition and trigger value You can also set two trigger conditions with trigger condition 2 set to “Disable”, “AND”, “OR”, or “XOR”. The trigger oscilloscope is triggered only when both conditions are met. When only one condition is used, set trigger condition 2 to “Disable”. The trigger conditions are as follows:

Table 6–7 Trigger conditions of the trigger oscilloscope

| Trigger condition | Description |
|---|---|
| Analog trigger | When the analog is greater/lower than or equal to the setpoint, the oscilloscope is triggered. |
| Analog bit trigger | Used to determine whether to trigger the oscilloscope at the rising/ falling edge, edge, or high/low level, and monitor. Select the analog and bit number to achieve the analog bit trigger. |

| Trigger condition | Description |
| --- | --- |
| Digit trigger | Used to determine whether to trigger the oscilloscope at the rising/ falling edge, edge, or high/low level, |
| State machine-based triggering | When the value of A0-00 (state machine) is greater/lower than or equal to the setpoint, the oscilloscope is triggered. |
| Fault trigger | Indicates that the oscilloscope is triggered upon fault. |
| Minor fault trigger | Used to set the rated motor voltage which can be obtained through the motor nameplate. |
| Alarm trigger | Used to set the rated motor current which can be obtained through the motor nameplate. |

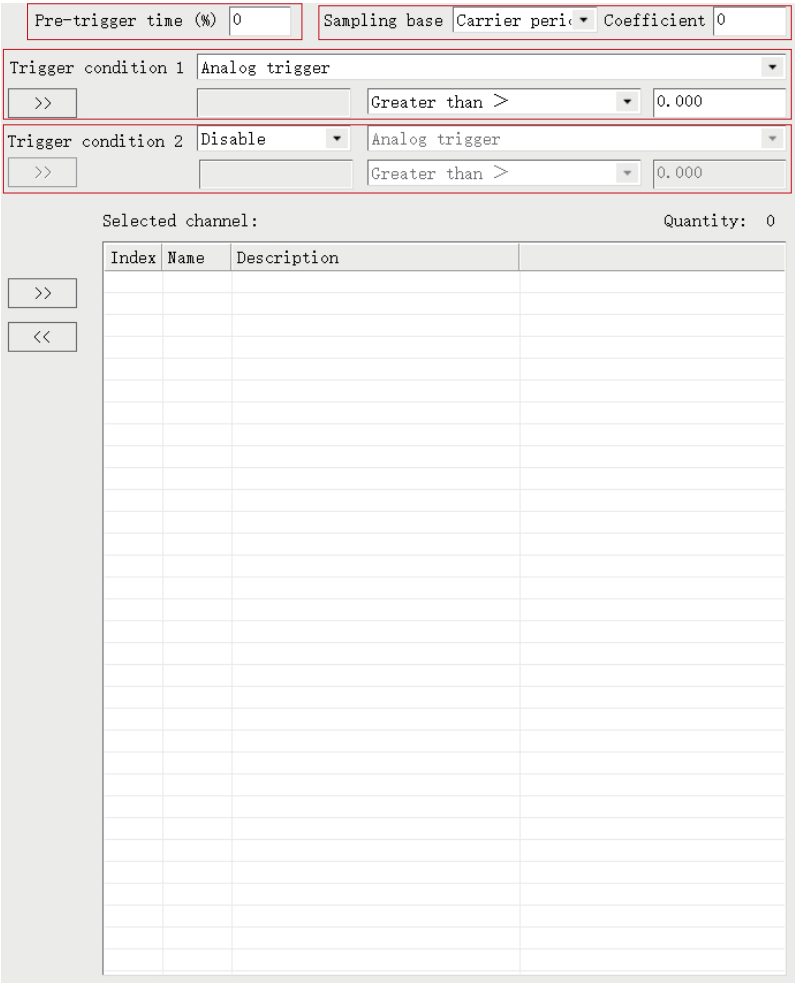



Figure 6-49 Trigger settings

After all settings (including parameter selection and trigger settings) are completed, click “Save as config” to save the trigger settings as a file which can be downloaded directly for next-time use.

4. Start the trigger oscilloscope.
   After the settings are completed, click “Start”. When the status is “Ready”, click “Read”, and the waveform file is saved as a file with the suffix .inotwv. Then, InoDriveStudio automatically opens the waveform that has been saved. Select the channel to be viewed.

   Click “Reset” to reset all settings to default. Click “Stop” to change the status from “Launched” to “Invalid data”. Click “Save as config” to save the trigger conditions. Click

"Download config" to download the saved configuration file. The trigger oscilloscope status include "Invalid data", "Launched", "Triggered" and "Ready".

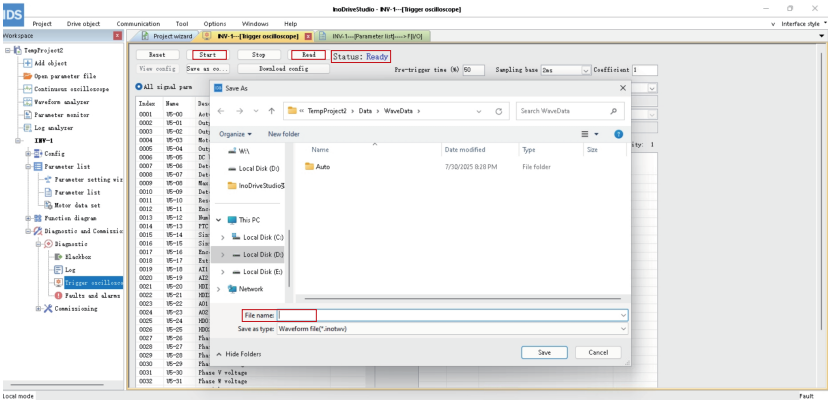


Figure 6-50 Saving the waveform file

Then, InoDriveStudio automatically opens the waveform that has been saved. Select the channel to be viewed.

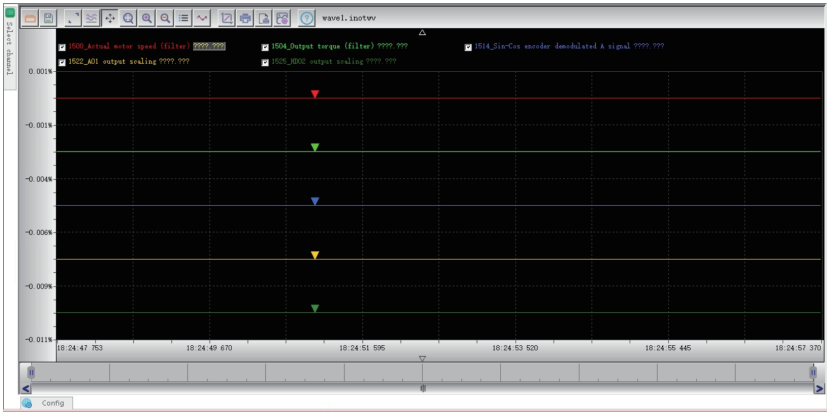


Figure 6-51 Trigger oscilloscope waveform display

## 6.6.4 Black Box

When a fault occurs, the controller collects data upon fault occurrence. For example, when a fault occurs, the MD880 controller collects the data generated 1.5 seconds before the fault and 0.5 seconds after the fault. The data includes 16 entries of ADC internal interruption data, 48 entries of internal data collected at a cycle of 2 ms, and 16 entries of customized data collected at a cycle of 2 ms. The data collected will be automatically saved to the SD of the controller. Up to 1000 groups of fault data can be saved.

The black box records when a fault occurs or when user-defined conditions are met.

- Automatic fault trigger condition: When the inverter module enters the fault state, black box record will be triggered once automatically.
- Customized command trigger condition: You can set H0-06 to trigger the black box record once at the rising edge. Use H0-40 to determine whether the black box records faults occurred during operation or at any time.

Table 6–8 Customized command trigger condition

| Parameter | Name | Setpoint |
|---|---|---|
| H0-06 | Custom black box trigger command source | 0: Inactive<br>Other: B connector |
| H0-40 | Exception detection enable selection 1 | Ones-: OFF2/OFF3 activation alarm<br>0: Disable<br>1: Enable<br>Tens-: HCU RTC battery voltage too low<br>0: Disable<br>1: Enable<br>Hundreds-: EX-FLASH read-write error alarm<br>0: Disable<br>1: Enable<br>Thousands-: SD card offline/error alarm<br>0: Disable<br>1: Enable<br>Ten thousands-: Conditions for SD card black box fault recording<br>0: Fault during operation<br>1: Fault that occurs at any time |

1. Go to “Diagnostic and Commissioning > Diagnostic > Black box” to display the black box interface. Click “Refresh” to view the historical faults and time upon fault occurrence.

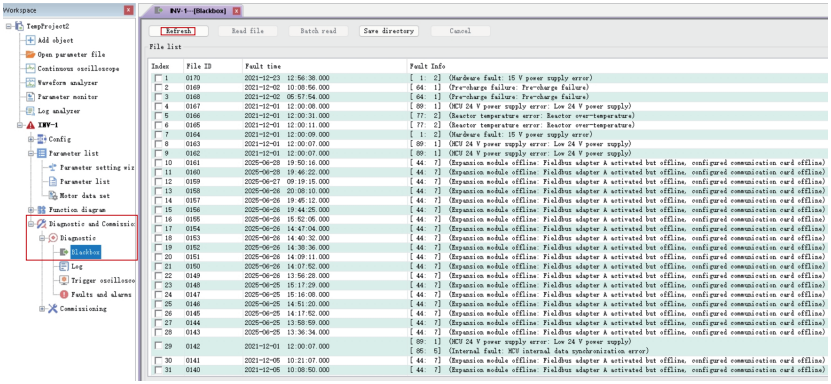


Figure 6-52 Black box interface

2. Select one of the faults, such as fault 4, select the file to be read, and save it. You can also select multiple files at the same time, click “Batch read” and save the files as waveform files with the suffix (*.inotwv). By default, the file is named after the fault information.

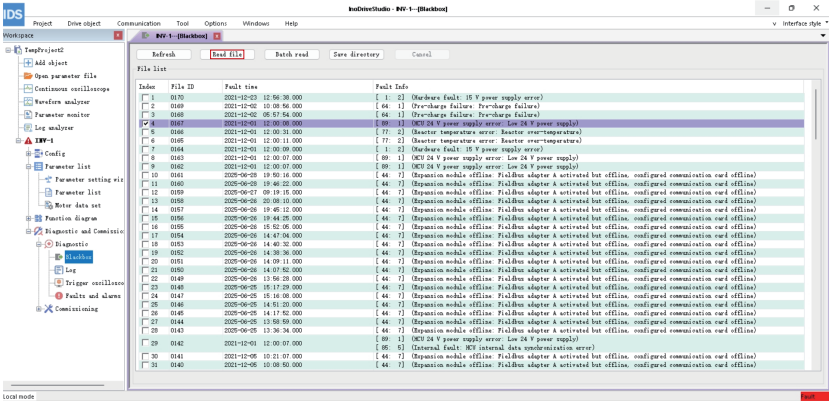


Figure 6-53 Reading file

3. After you click Save, InoDriveStudio automatically opens the waveform that has been saved. Select the channel to be viewed, and the corresponding waveform will be shown.



Figure 6-54 Reading waveform

## *Note*

Click “Save directory” to save the directories recorded by the black box to a csv file.

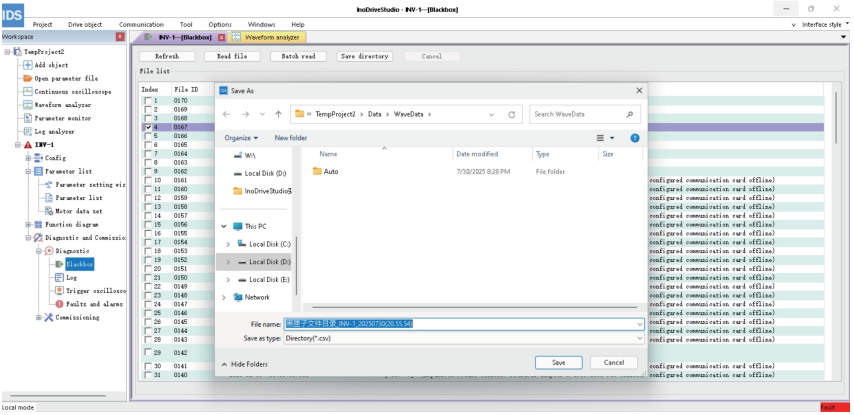


Figure 6-55 Saving directory

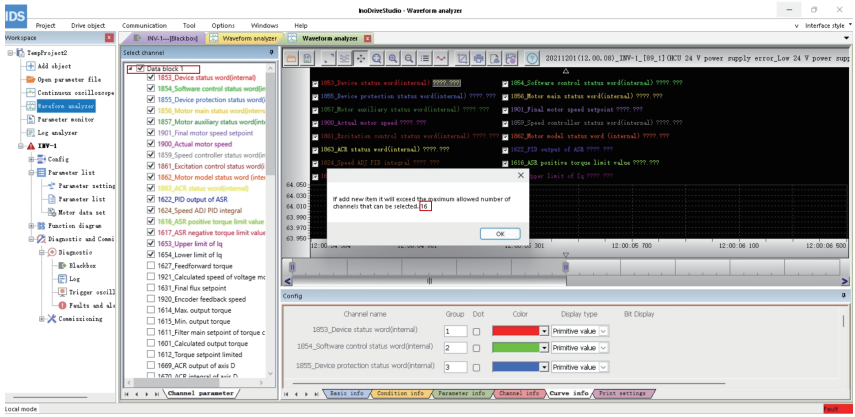
### 6.6.5 Waveform Analyzer

You can use the waveform analyzer to open the recorded waveform file. The following table shows the waveform file types supported by the waveform analyzer. Double-click “Waveform analyzer” in the Workspace pane to access the waveform analyzer. The waveform analyzer consists of the channel selection area, waveform display area, waveform configuration area, and toolbar.

Table 6–9 Waveform files supported

| Waveform file | Suffix |
|---|---|
| Continuous oscilloscope file | *.inotrc |
| Trigger oscilloscope file | *.inotwv |
| Black box file | *.inotwv |

You can click “Data block 1” in “Select channel” area to select/unselect all channels (up to 16 channels that can be selected at the same time). When the opened waveform file contains no more than 16 channels, all channels are selected automatically by the waveform analyzer.




The waveform display area and toolbar are consistent with that of the continuous oscilloscope. For details, see the section “Continuous Oscilloscope”.

Compared with continuous oscilloscope, the waveform analyzer presents more options in the configuration area, including basic information, condition information, parameter information, and channel information.

- The “Basic info” interface contains basic information of the waveform and the AC drive.

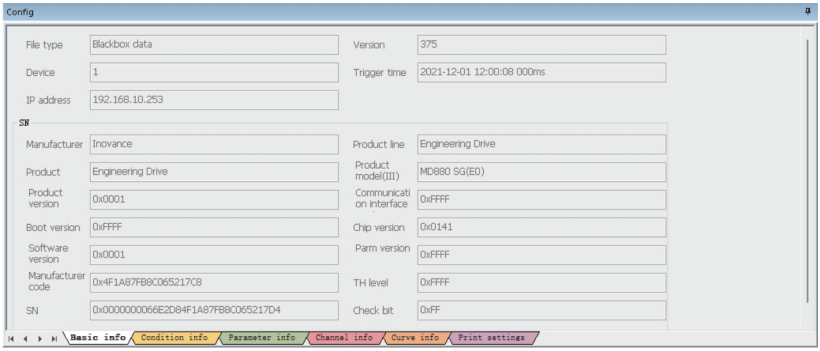



Figure 6-56 Basic information interface

- The “Condition info” interface contains waveform trigger conditions and is available only when the waveform file is generated by the trigger oscilloscope or black box.

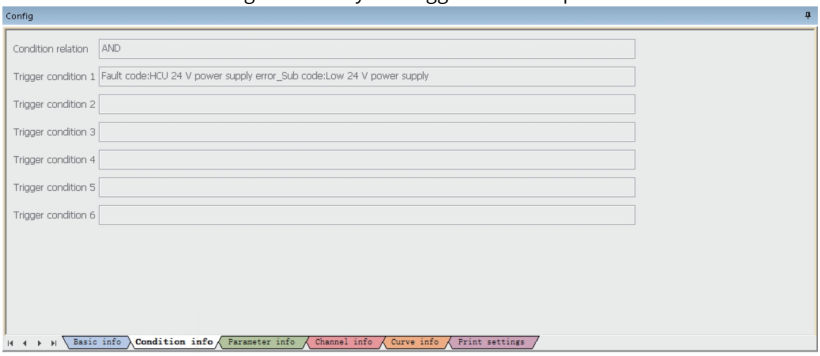



Figure 6-57 Condition information interface

- The parameter information interface contains information of basic operating parameters and faults and is available only when the waveform file is generated by the trigger oscilloscope or black box.

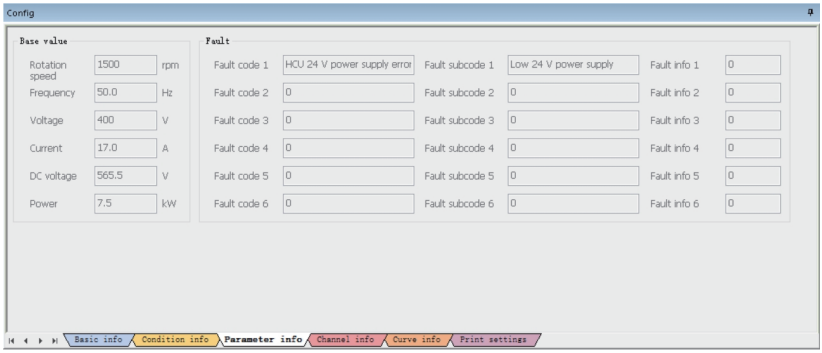



Figure 6-58 Parameter information interface

- You can find information of all channels in the data area of the channel information interface.

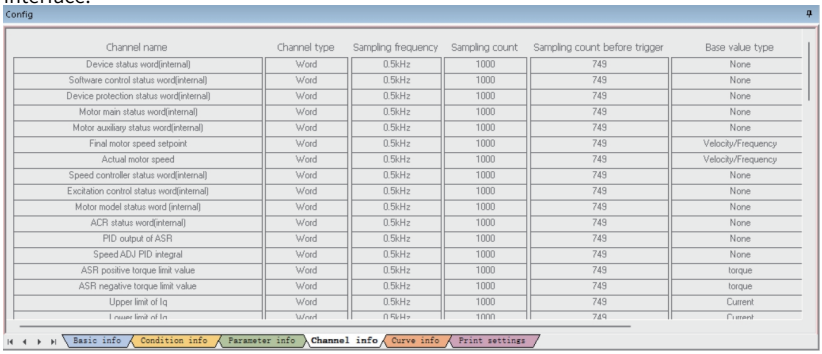



Figure 6-59 Channel information interface

## 6.7 Diagnosis and Commissioning

### 6.7.1 Overview

Diagnosis and commissioning is one of the major functions of InoDriveStudio. When a fault occurs, you can use this module for commissioning, analysis, and modification.

### 6.7.2 Log

Log is an important way of recording and analyzing status changes and faults. Go to “Diagnostic and Commissioning > Diagnostic > Log” to open the log interface. Click “Refresh” to display all refreshed logs.

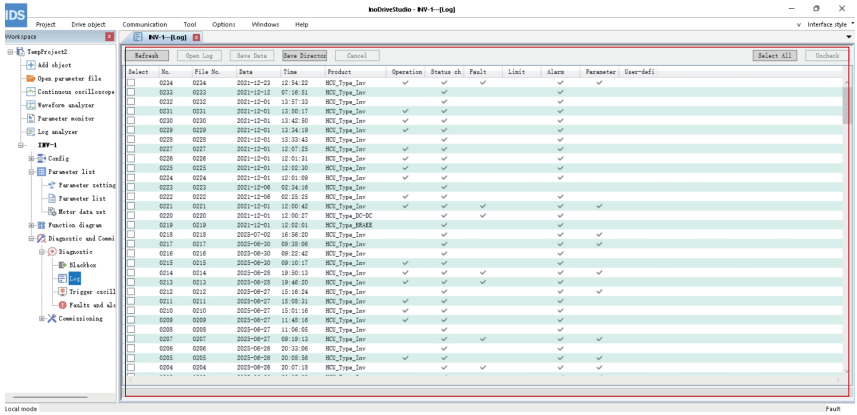


Figure 6-60 Log

Check the box in front of a log record and click “Open Log”. The “Log Data” window pops up which presents the log records and detailed device information. Each entry of log data indicates the control word, status word, terminal voltage, and internal voltage of the current state machine.

The log records the data upon fault/minor fault, alarm, power-on/off, fault reset, control mode switchover, default restoration, or when the control panel obtains or releases the control permission. The file name can be set by default or user-defined.

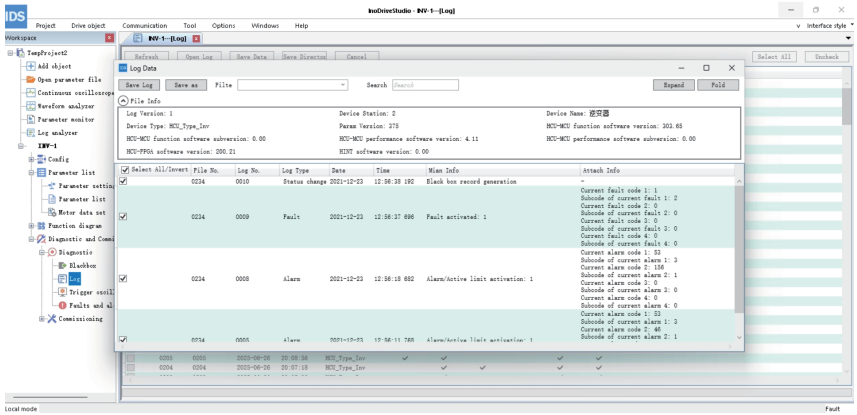


Figure 6-61 Log details

Click “Save Directory” to save the directory of the log.

You can also double-click “Log analyzer” in the Workspace pane to pop up an “Open Log” window.

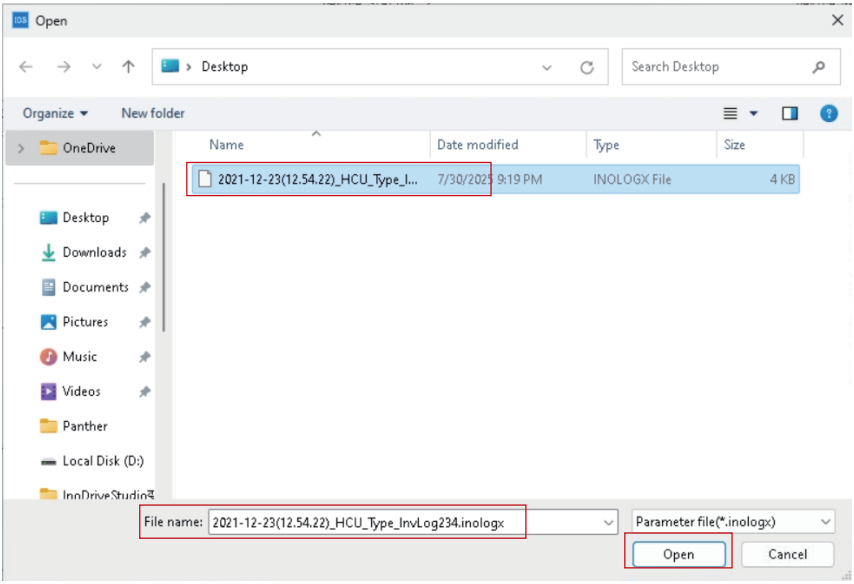



Figure 6-62 Opening a log file

Select the log parameter file to be opened and click “Open”.

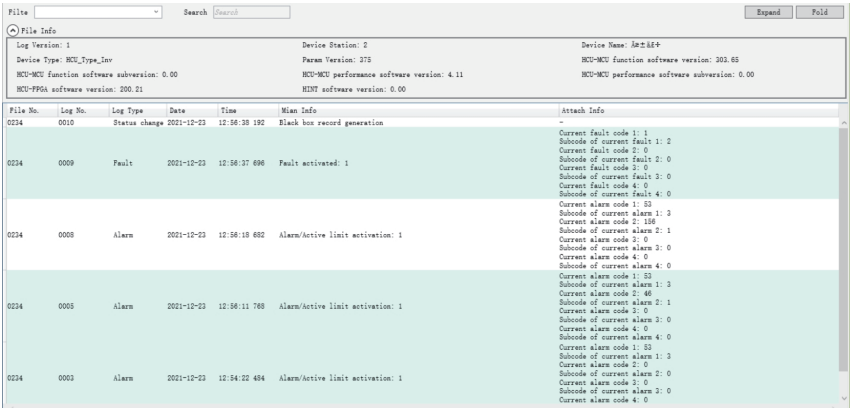


Figure 6-63 Log file

You can filter the log records by the log type in the log analyzer.

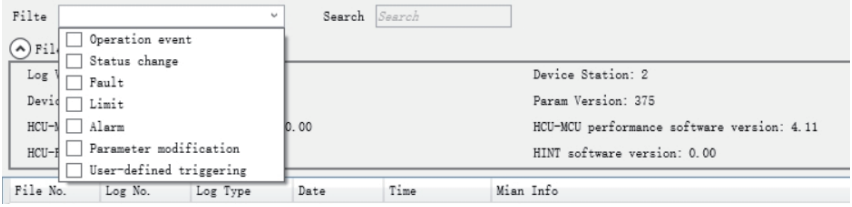



Figure 6-64 Filter by log type

You can enter a byte string to search for all logs, but search based on file number and log number is not supported.

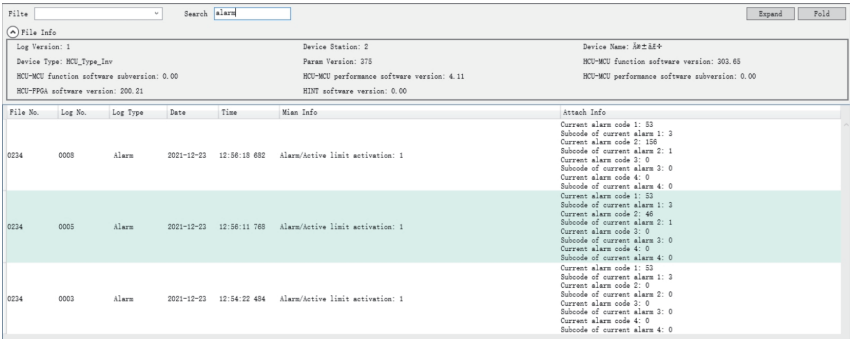



Figure 6-65 Global search

Click “Expand” or “Fold” to expand or fold the file information.

## 6.7.3 Faults and Alarms

There are two ways to view faults through InoDriveStudio.

- Method 1: View the fault parameter group through the parameter list.
- Method 2: Go to “Diagnostic and Commissioning > Diagnostic > Faults and alarms”.

There are two sub-interfaces including “Current fault” and “History fault”, indicating activated unreset faults/alarms and all faults/alarms occurred (including current faults) respectively.

### 6.7.3.1 Current Faults

Go to “Diagnostic and Commissioning > Diagnostic > Faults and alarms > Current fault” to open the current fault interface.

When multiple devices are connected to InoDriveStudio, select a specific drive object or all drive objects in the fault/alarm list as required.

You can select the fault display type, such as fault, minor fault, alarm, or all faults, in the fault/alarm list.

When a certain fault in the fault/alarm list occurs, manually click “Reset current fault” to reset the fault.

For a current fault, you can also click “Show details” to view the speed, current, bus voltage, output torque, control word 1, control word 2, status word, and state machine upon fault occurrence. Click “Hide details” to hide the expanded details.

Click “Refresh” to forcibly read the faults of all devices again.

After selecting the fault, click “Help” or double-click the fault log to pop up the help file where details of the fault can be found.

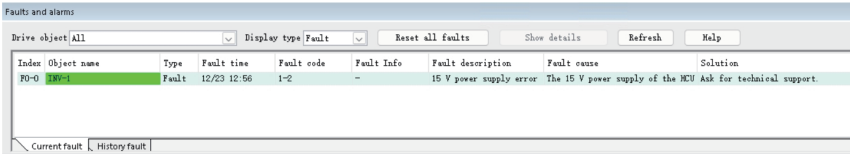



Figure 6-66 Current faults

The meaning of each field for a fault record is as follows.

| Field | Meaning |
|---|---|
| Index | Indicates the fault record number. If the index begins with an F, a fault occurs; if it begins with an L, a minor fault occurs; if it begins with an A, an alarm is reported. |
| Object name | Indicates the drive object of the current fault. |
| Type | Indicates the type of the current fault. |
| Fault time | Indicates the time upon fault occurrence, |
| Fault code | Indicates the fault code of the fault. |
| Fault information | Indicates the meaning of the fault code. |
| Fault description | Indicates the meaning of the fault subcode. |
| Fault cause | Indicates the fault cause. |
| Solution | Indicates the solution that may help clear the fault. |
| Speed | Click “Show details” to view the running frequency upon fault occurrence. |
| Current | Click “Show details” to view the current upon fault occurrence. |
| Bus voltage | Click “Show details” to view the bus voltage upon fault occurrence. |
| Output torque | Click “Show details” to view the output torque upon fault occurrence. |
| Control word 1 | Click “Show details” to view the system control word 1 upon fault occurrence. |
| Control word 2 | Click “Show details” to view the system control word 2 upon fault occurrence. |

| Field | Meaning |
|---|---|
| State word | Click “Show details” to view the state word upon fault occurrence. |
| State machine | Click “Show details” to view the state machine upon fault occurrence. |

#### 6.7.3.2 History Faults

Go to “Diagnostic and Commissioning > Diagnostic > Faults and alarms > History fault” to open the history fault interface. The number of recorded history faults vary with device.

In the history fault interface, all faults can be reset, but details of each fault record cannot be accessed.

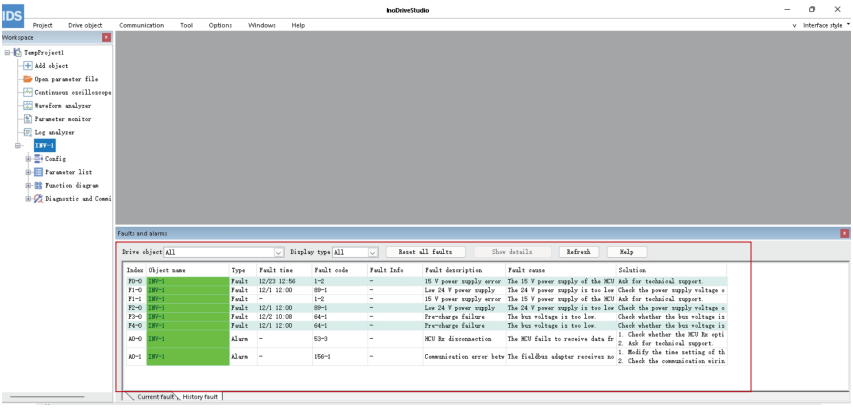



Figure 6-67 History faults

## 6.7.4 Control Panel

You can use the control panel of InoDriveStudio to start and stop the drive, reset faults, and so on. Go to “Diagnostic and debug > Debug > Control panel” to open the control panel, as shown in the following figure.

#### 6.7.4.1 Default Control Panel

You can start or stop the device and monitor the device status on the control panel which may vary slightly according to devices. For example, the control panel of the MD880 inverter has the following features:

- When multiple devices are connected to InoDriveStudio, you can select a specific drive object in the control panel for control operations.
- Before controlling a device through the control panel, click "Request control" to gain control permission of the device.

- After you obtain control permission, you can click “Start” or “Stop” to start or stop the device.
- After the “Control enable” is checked, click “OFF2”, “OFF3”, or “Enable” to switch the control word directly, achieving control of the device.
- You can set the speed reference, switch the unit of speed reference, and invert the speed through the control panel.
- Click “Reset” on the control panel to reset the fault.
- Clicking the space key for three consecutive times will automatically trigger the OFF2 stop command.
- View the operating speed, state machine, alarm signal, output current, output voltage, output torque, bus voltage, current command group, and current motor group through the control panel. Actual control panels may vary according to product type.

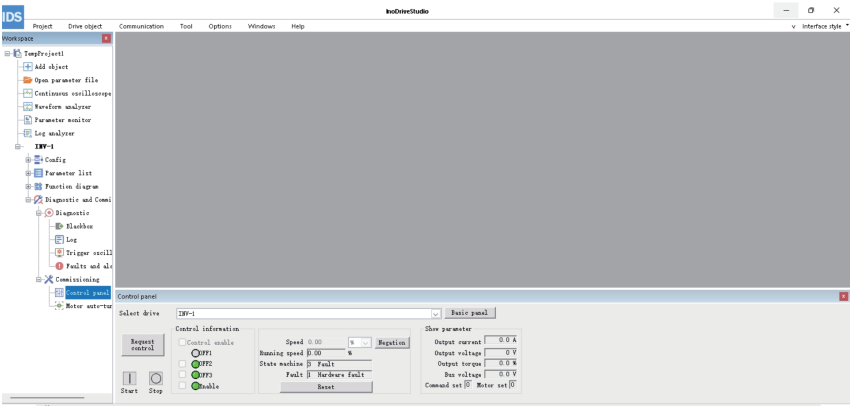


Figure 6-68 Default control panel of MD880 inverter

### 6.7.4.2 Basic Control Panel

The basic panel is a simplified representation of the control panel. It displays only the most essential information and leaves out output current, output voltage, output torque, and bus voltage. The following figure shows the basic panel of an MD880 inverter.




Figure 6-69 Basic control panel

## 6.7.5 Motor Auto-tuning

Motor auto-tuning is the process through which the AC drive obtains the parameters of the controlled motor. Go to “Diagnostic and Commissioning > Commissioning > Motor auto-

tuning". Double-click "Motor auto-tuning" to display the motor auto-tuning interface. The motor parameter group currently selected is displayed at the top of the interface.

Basic parameters are parameters that must be set properly before auto-tuning and determine the reliability of motor auto-tuning results. The basic parameters are described as follows.

Table 6–10 Basic parameters for motor auto-tuning

| No. | Name | Description |
|---|---|---|
| 1 | Motor type | Used to set the motor type. |
| 2 | Speed feedback selection | Used to set the speed feedback source. Sources available: encoder detection module 1/2/3. |
| 3 | Motor phase sequence | Used to set the motor phase sequence, which determines the motor running direction of forward rotation. If the encoder speed is opposite to the selected motor direction, modify this parameter to adjust the speed measurement direction. |
| 4 | Rated motor power | Used to set the rated motor power which can be obtained through the motor nameplate. |
| 5 | Rated motor frequency | Used to set the rated motor frequency which can be obtained through the motor nameplate. |
| 6 | Rated motor voltage | Used to set the rated motor voltage which can be obtained through the motor nameplate. |
| 7 | Rated motor current | Used to set the rated motor current which can be obtained through the motor nameplate. |
| 8 | Rated motor speed | Used to set the rated motor speed which can be obtained through the motor nameplate. |
| 9 | Motor pole pairs | Indicates the number of pole pairs of the motor. If you are uncertain, input the value 0, and the number of pole pairs will be obtained automatically during motor auto-tuning. |
| 10 | Rated motor power factor | Indicates the power factor of the motor which can be obtained from the motor nameplate. |
| 11 | Maximum speed | Indicates the maximum motor speed which is set based on a percentage of the rated synchronous speed of the motor. |
| 12 | Minimum speed | Indicates the minimum motor speed. This parameter is not required for the motors that do not support low-speed operation. |
| 13 | Maximum current | Indicates the maximum motor current which is set based on a percentage of the rated motor current. |

The auto-tuning results refer to parameters that are modified after motor auto-tuning, as described in the following table.

Table 6–11 Motor auto-tuning results

| No. | Name | Description |
|---|---|---|
| 1 | Moment of inertia | Indicates the moment of inertia during motor motion. |
| 2 | Moment of inertia ratio | Indicates the ratio of load inertia to motor inertia. |
| 3 | Number of motor pole pairs | Indicates the number of pole pairs of the motor. |
| 4 | Stator resistance | Indicates the resistance of the motor stator. |
| 5 | Back EMF | Indicates the voltage that opposes the change in current that induced it. |
| 6 | Friction torque | Indicates the torque generated by friction during motor motion. |
| 7 | Hot-cold resistance ratio | Indicates the ratio of motor winding resistance in a cold state (namely, at room temperature) and resistance in a hot state (stable temperature after running for a period of time). |
| 8 | Electromechanical time constant | Indicates the time elapsed when the motor accelerates from a standstill to a speed 63.2% of its no-load speed. |
| 9 | D axis inductance | Indicates the inductance of D axis. |
| 10 | Q axis inductance | Indicates the inductance of Q axis. |

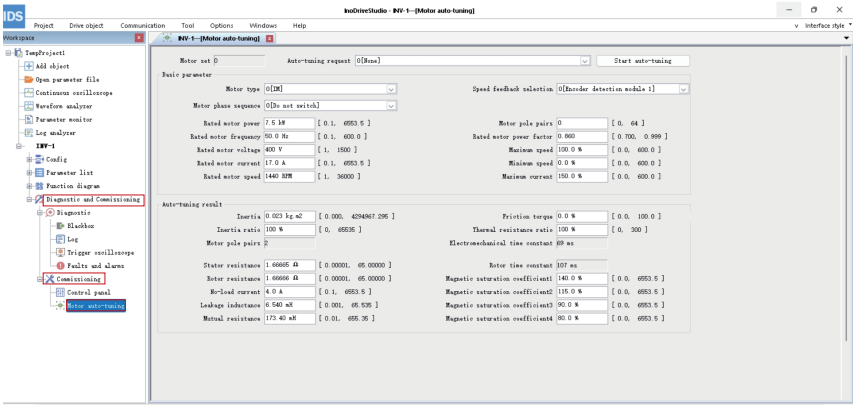
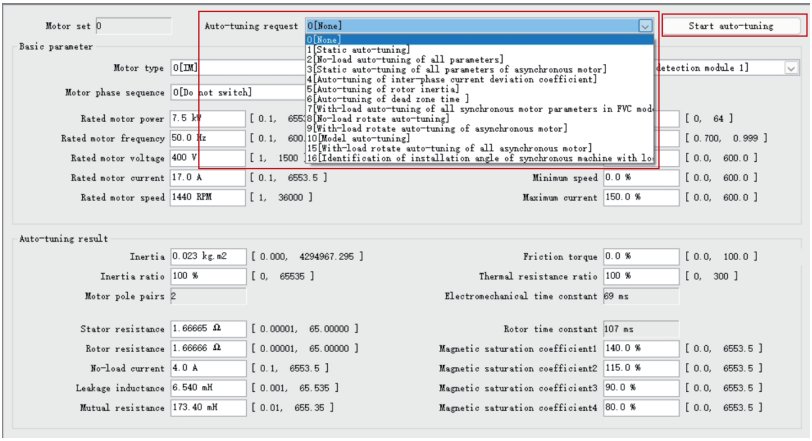
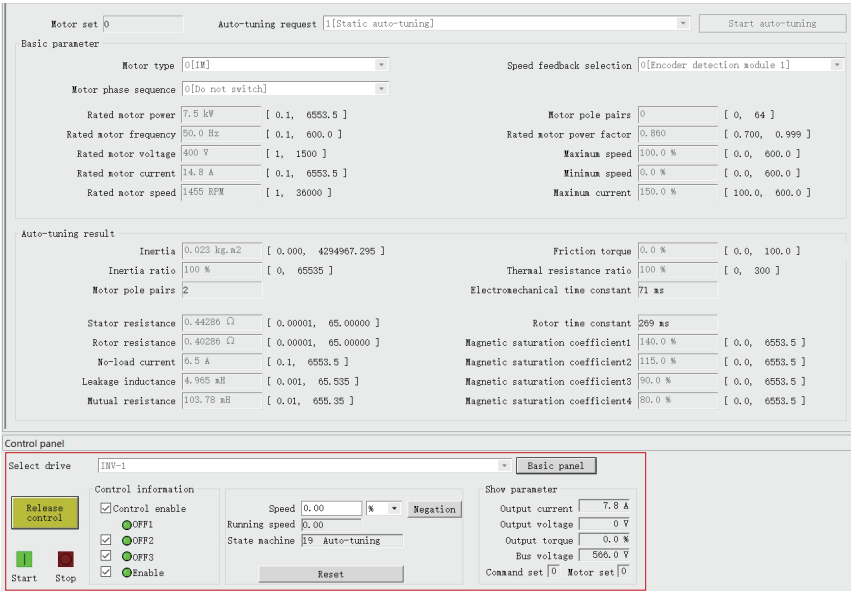



Figure 6-70 Motor auto-tuning interface

After setting the auto-tuning request properly, click "Start auto-tuning" to start auto-tuning. If no auto-tuning operation is performed within a period of time after the request is selected, the “Auto-tuning request” is reset to “0 [None]”.




Click “Start auto-tuning”, and the control panel automatically pops up. Meanwhile, all parameters in the auto-tuning interface turn grey and cannot be edited.




After auto-tuning is completed, parameters in the auto-tuning interface are restored to normal.

## 6.8 Device Management

### 6.8.1 Overview

You can manage multiple devices easily on InoDriveStudio, mainly in terms of object addition and device renaming.

### 6.8.2 Adding an Object

1. Double-click “Add object” under the project to add an offline or online device.

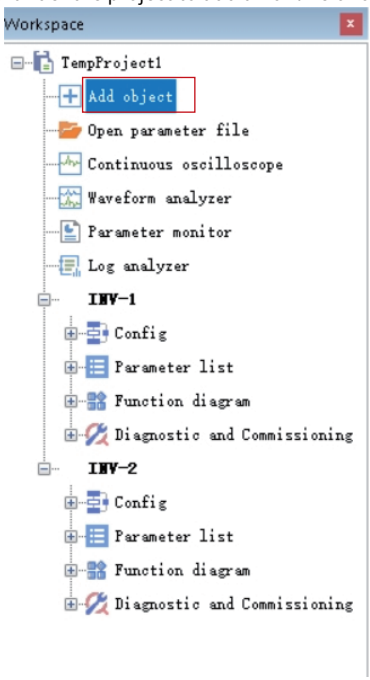



Figure 6-71 Adding a device

2. The “Add object” interface pops up. During object addition, if an object is found connected and online, the connection mode and baud rate then cannot be modified. If an object is found connected but offline, the baud rate can be modified. Set the connection mode properly for drive connection. For other configuration items, see *" Connection" on page 41*.

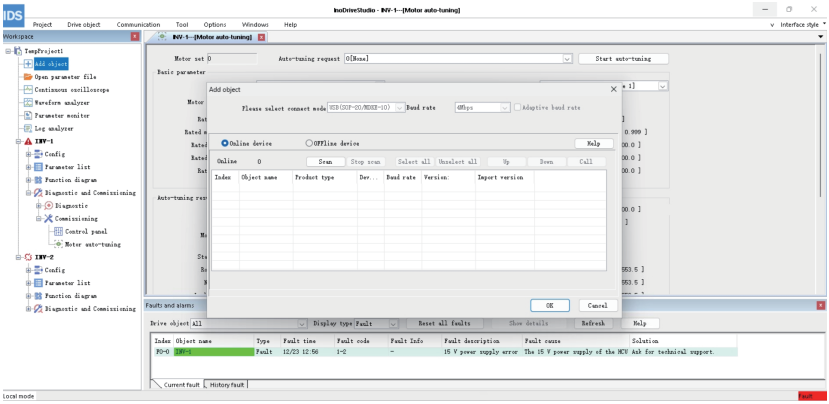


Figure 6-72 Scanning the object

## 6.8.3 Context Menu

- Connect with the device.
  InoDriveStudio supports easy connection with the device. Right-click the device name, and the following interface pops up. Select “Connect” to connect the device directly. If the device is not connected successfully, the following alarm pops up. You need to check the device connection carefully. For example, check whether the device is powered on or connected to the network cable/PC properly.




Figure 6-73 Connection failed

- Disconnect with the device.
  InoDriveStudio supports easy disconnection with the device. Right-click on the device name, and the following interface pops up. Select “Disconnect” to disconnect the device directly.

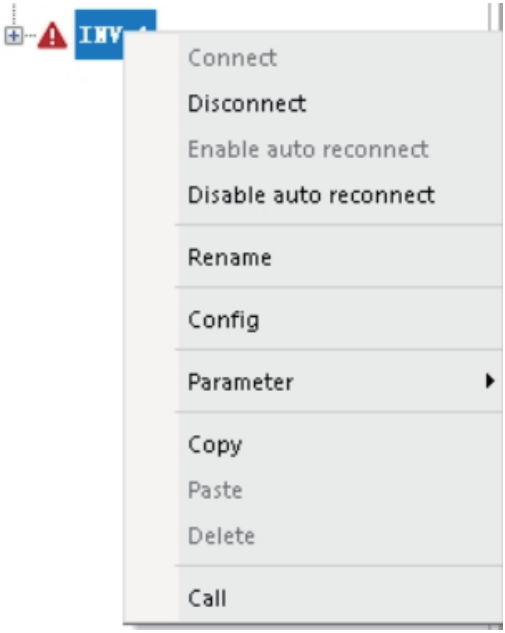



Figure 6-74 Disconnecting with the device

- Enable automatic reconnection.
  InoDriveStudio supports easy reconnection with the device. When the device is disconnected with the software accidentally, right-click the device name, and the following interface pops up. Select “Enable auto reconnect”. When the device restores to normal, the software automatically connects the device, sparing efforts for manual connection.

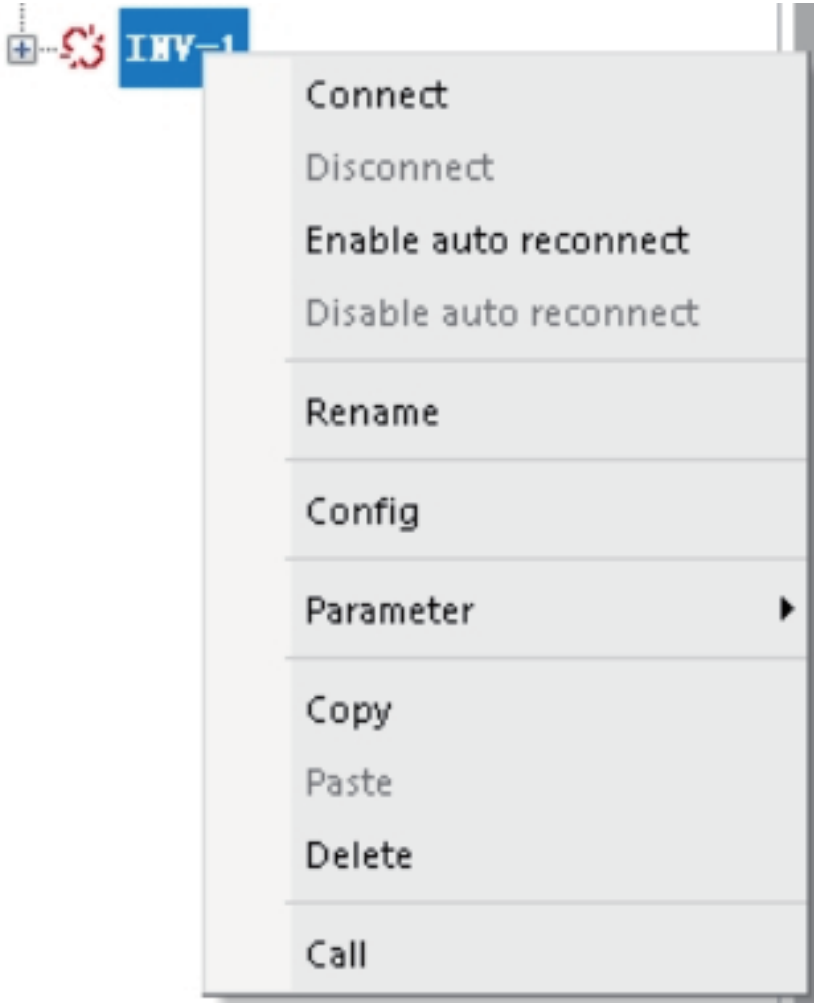



Figure 6-75 Enabling automatic reconnection

- Disable automatic reconnection.
  InoDriveStudio supports easy automatic disconnection with the device. Right-click on the device name, and the following interface pops up. Select “Disable auto reconnect” to automatically disconnect the device directly. When multiple devices are connected to the software, you can select “Disable auto reconnect” to disconnect a certain device. When multiple software are connected to a device, you can select “Disable auto reconnect” to disconnect certain software.

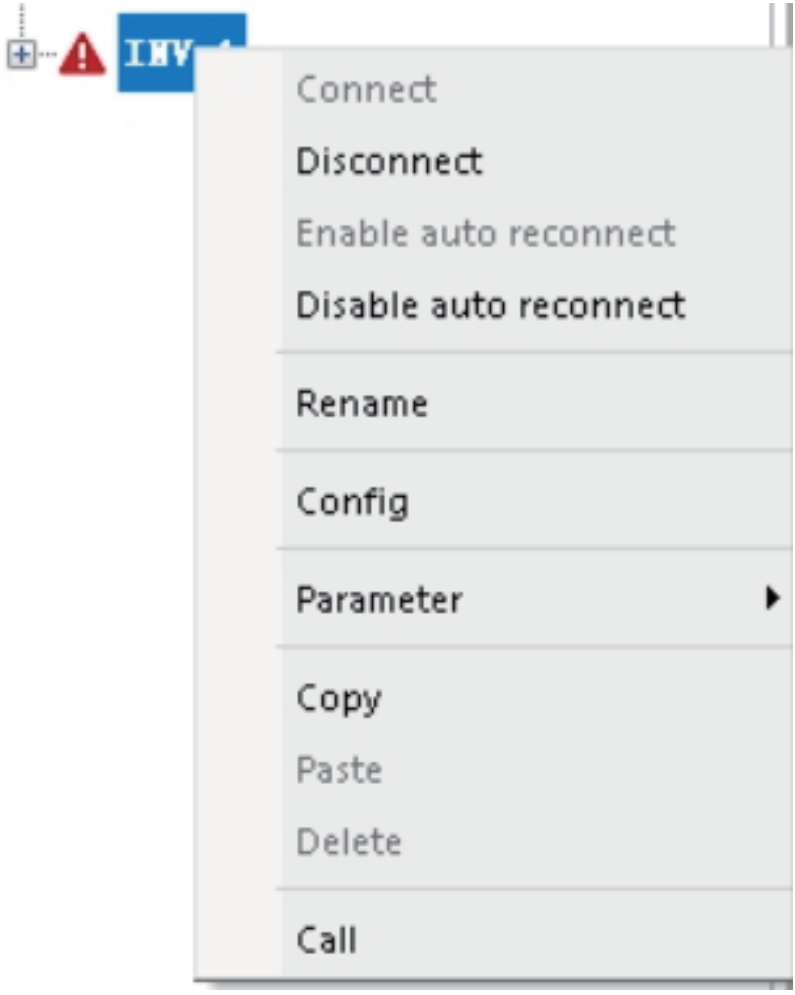



Figure 6-76 Disabling automatic reconnection

- Rename the device.
  You can easily rename an online or offline device on InoDriveStudio. Right-click on the device name, and the following interface pops up. Select “Rename” to rename the device.

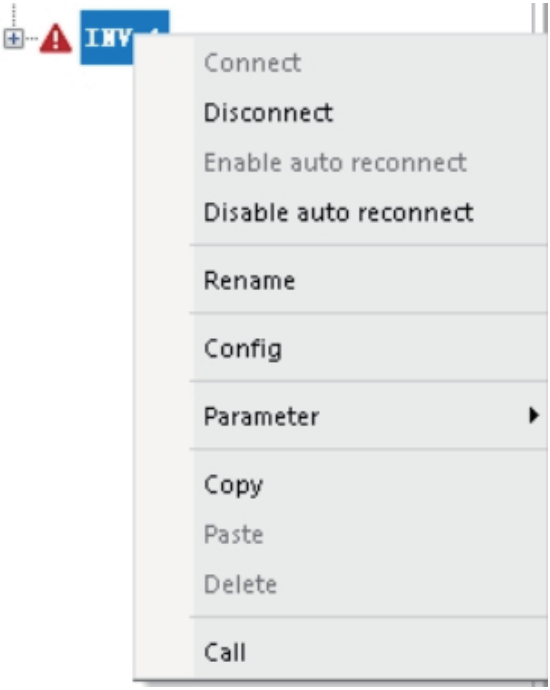



Figure 6-77 Renaming the project

- Configure the drive object.
  Click "Configure", and InoDriveStudio jumps directly to the drive object configuration interface for configuration.

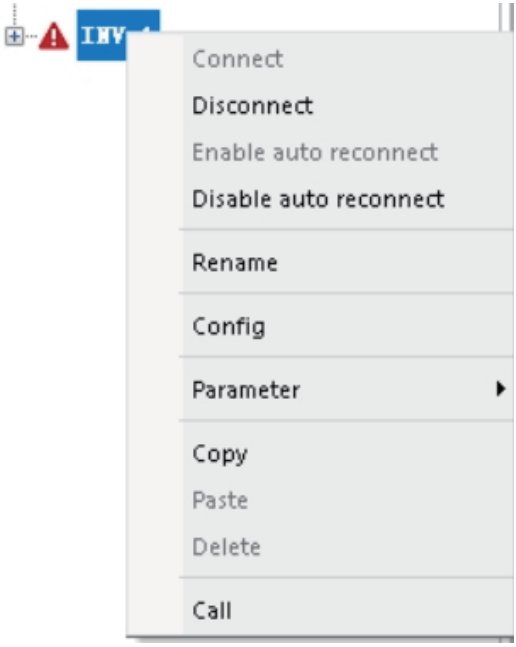



Figure 6-78 Configuring the drive object

- Parameter
  Click "Parameter", and you can save, upload, download, and compare all parameters on InoDriveStudio.

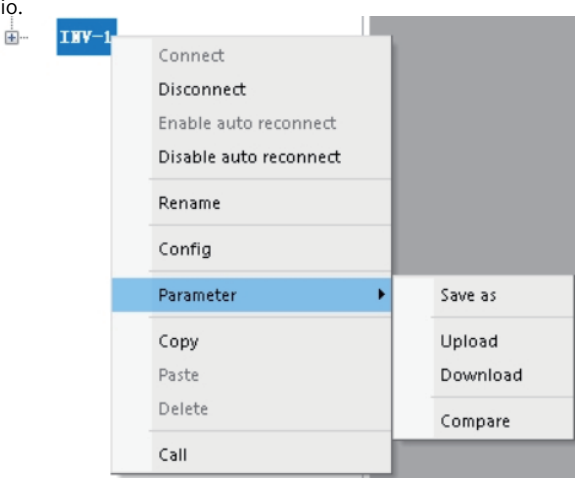



Figure 6-79 Device parameter configuration

- Copy a device.
  You can easily copy a controller on InoDriveStudio. Right-click on the device name, and the following interface pops up. Select “Copy” to copy the device.

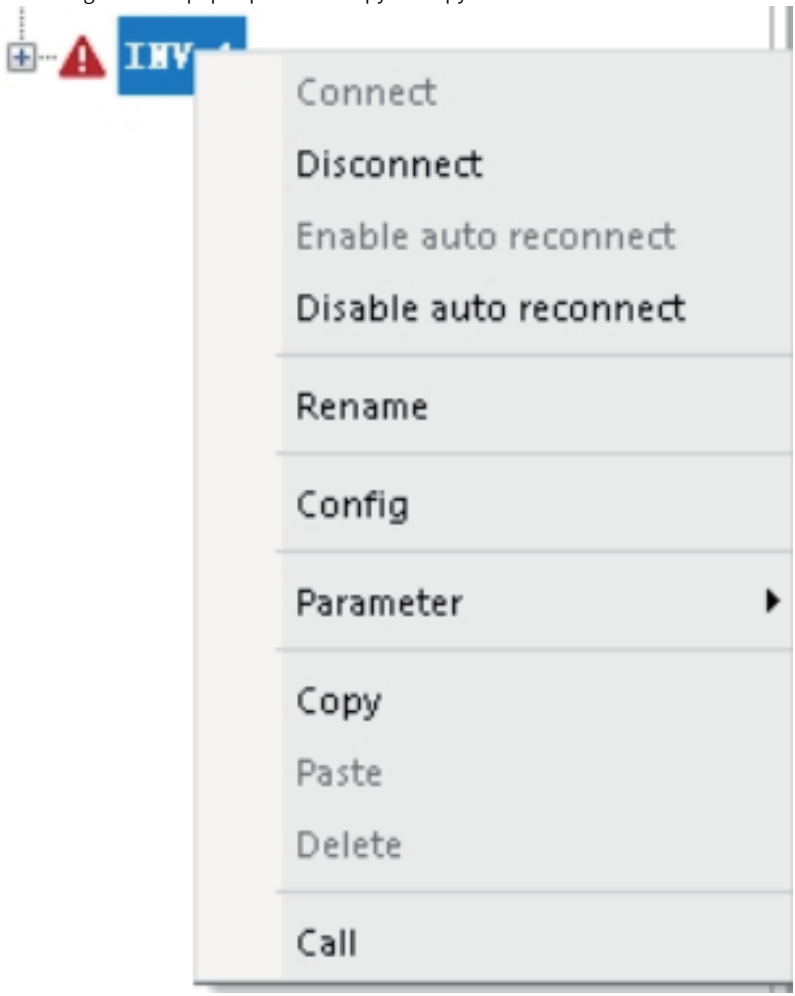



Figure 6-80 Copying a device

- Paste the device.
  You can easily create a same controller on InoDriveStudio. Right-click on the device name, and the following interface pops up. Select “Paste” to paste the controller to the project.

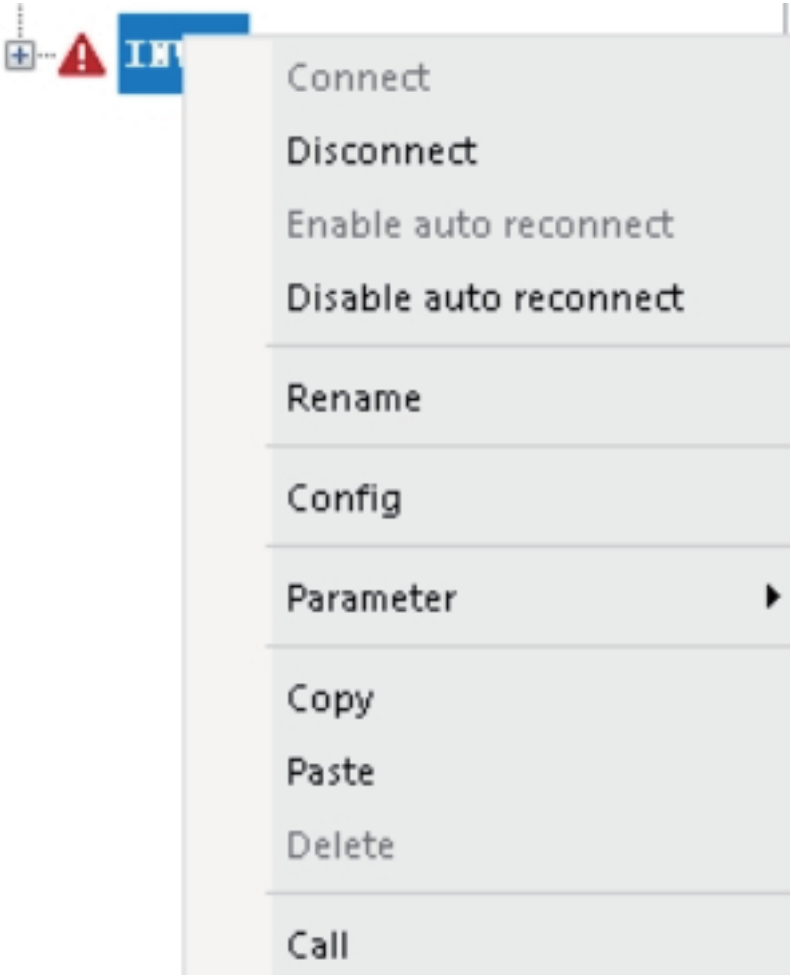



Figure 6-81 Pasting the device

- **Delete the device.**
  You can easily delete a specific device on InoDriveStudio. Right-click on the device name, and the following interface pops up. Select “Delete” to delete the device.

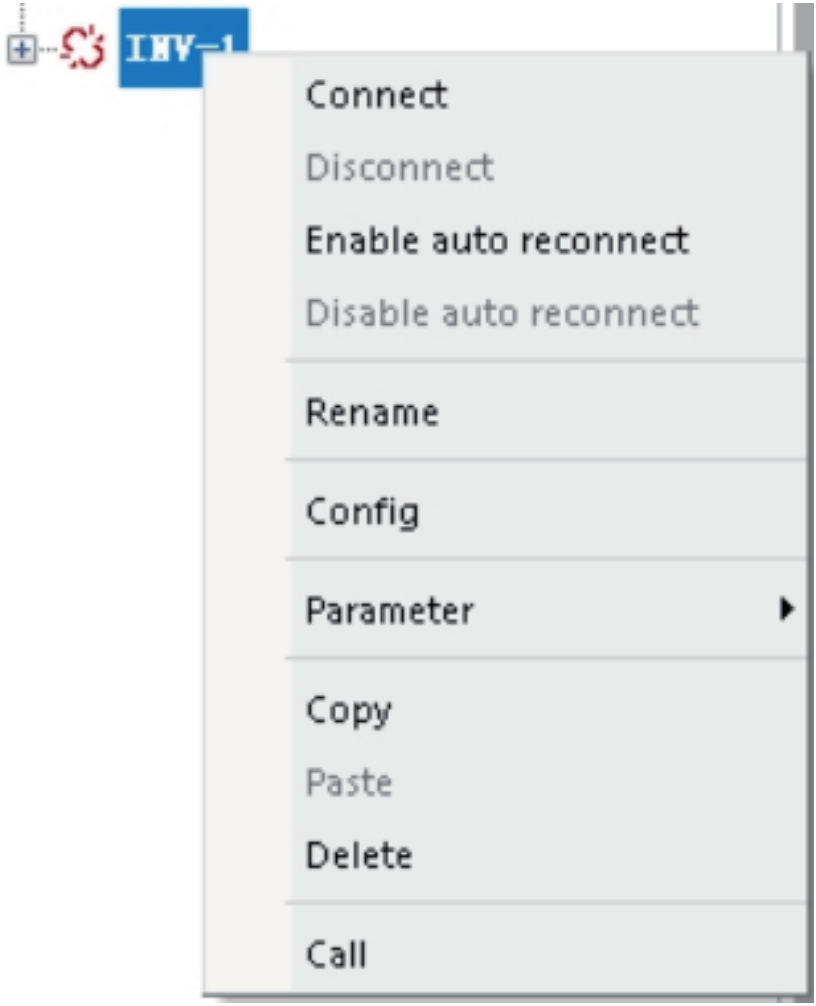



Figure 6-82 Deleting the device

- Call the controller.
  Use InoDriveStudio to call different controllers. Right-click on the device name, and the following interface pops up. Select “Call” to call the controller. You can easily find the flashing controller being called among a bunch of scattered controllers.

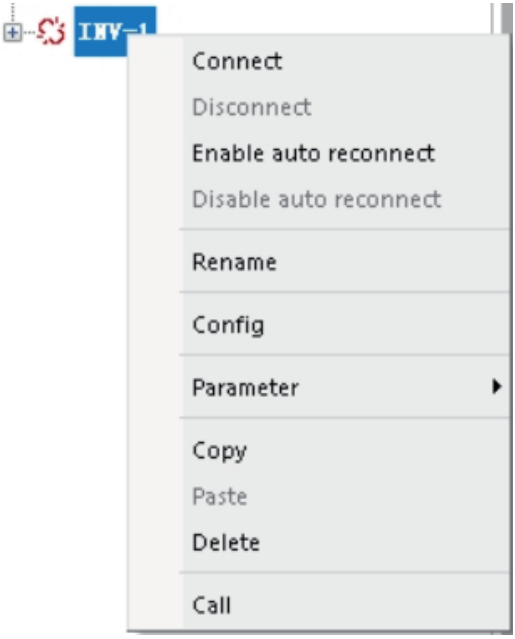



Figure 6-83 Calling the device

## 6.9 Function Diagram

### 6.9.1 Overview

The function diagrams reveal the relationship among function parameters in data flows, thus quickly familiarizing users with the use of AC drives. They are specific to the device and thus may not be supported by some devices.

### 6.9.2 Interfaces and Functions

Take the MD880 inverter as an example. The following figure shows the structure tree and home page of the function diagram. Multiple modules with sub-interfaces are located on the lower part of the home page.

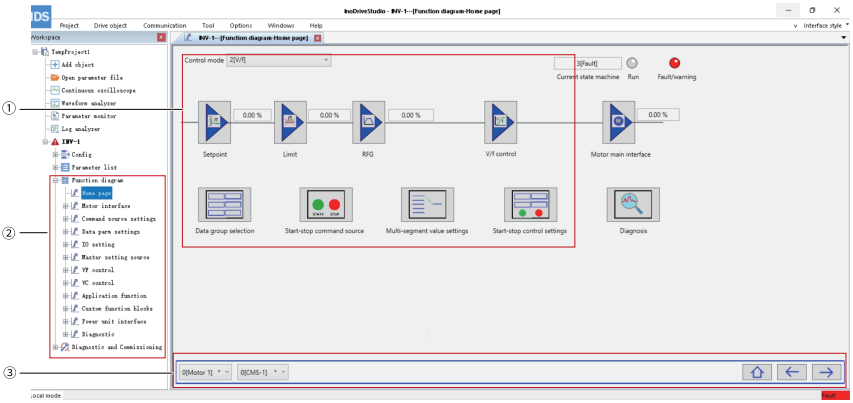
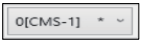



Figure 6-84 Function diagram of MD880 inverter

| No. | Name |
|---|---|
| ① | Function diagram |
| ② | Structure tree |
| ③ | Navigation bar |

The navigation bar sits at the bottom of every function diagram interface.

Table 6–12 Descriptions of navigation bar options

| Shortcut key | Function description |
|---|---|
|  | Homepage button Click this button to return to the home page. |
|  | Back button Click this button to return to the previous page. If the current page is the first page opened, this button is inactive. |
|  | Forward button. Click this button to jump to the next page that you clicked before. If the current page is the first page opened, this button is inactive. |
|  | This drop-down box is optional and is only visible in the inverter module. If motor 1 is selected, an asterisk ("*") is marked after it. You can use this drop-down box to switch the motor and view related interface parameters of different motors. |
|  | This drop-down box is optional and is only visible in the inverter module. If reference channel 1 is selected, an asterisk ("*") is marked after it. You can use this drop-down box to switch the reference channel and view related interface parameters of different references. |

The following table lists the models that support function diagrams.

| Series | Model |
|---|---|
| MD880 | Inverter |
| | Active rectifier (AFE) |

Take the MD880 inverter as an example. The meaning of each function diagram page is as follows:

| Module name | Interface name | Function description |
|---|---|---|
| Home page | Home page | Presents an overview of the function diagram data flow, which facilitates user understandings of overall data flow. |
| Motor interface | Motor main interface | Contains monitoring parameters of the motor and jump buttons for motor sub-interfaces. |
| | Motor data | Indicates motor-related parameters for user modification. |
| Command source settings | Start and stop command source | Used to set the source of drive start/stop and fault reset. |
| | Data channel selection | Used to set the source of drive reference channel and motor data group. |
| Data parameter settings | Multi-segment value sets | Used to set the multi-reference value. |
| | Motor start-stop setting | Used to set parameters related to motor start/ stop. |
| IO setting | Digital setting | Used to set DI/DO/HDI/HDO parameters of the drive. |
| | Analog setting | Used to set AI/AO parameters of the drive. |
| Master setting source | Main speed setpoint | Used to set the speed source and speed setpoint. |
| | Speed limit | Used to set the speed limit and jump frequency parameters. |
| | RFG module | Used to set the ramp acceleration/deceleration parameters. |
| | Additional speed settings | Used to set the additional speed and its source. |
| | Torque setting | Used to set the torque control parameters. |
| V/f control | V/f control settings | Used to set the voltage and current parameters in V/f control mode. |
| | V/f mode Vdc control | Used to set the bus voltage control parameters in V/f control mode. |

| Module name | Interface name | Function description |
|---|---|---|
| V/c control | Flux setting | Used to set the flux parameters in vector control mode. |
| | Flux current setting | Used to set the flux current parameters in vector control mode. |
| | Synchronous motor excitation setting | Used to set the excitation parameters of synchronous motor in vector control mode. |
| | Speed regulator | Used to set the speed regulator parameters in vector control mode. |
| | Additional torque setting | Used to set the additional torque parameters in vector control mode. |
| | Torque limit | Used to set the torque limit parameters in vector control mode. |
| | Torque current setting | Used to set the torque current parameters in vector control mode. |
| | Current regulator | Used to monitor parameters of d-axis and q-axis current in vector control mode. |
| | Output voltage conversion | Used to monitor voltage of d-axis and q-axis and final output voltage in vector control mode. |
| | Vdc control | Used to set or monitor the bus voltage control parameters in vector control mode. |
| Application function | Process PID controller | Used to set PID parameters. |
| | Brake control | Used to set brake parameters. |
| | Position control: boot page | The position control boot page serves as the overview interface which includes functions and data flow of position control and allows users to easily jump to specific sub-interface. |
| | Position control: positioning control | Positioning control facilitates position control parameter settings. |
| | Position control: synchronization control | Synchronous control facilitates synchronization control parameter settings. |

| Module name | Interface name | Function description |
|---|---|---|
| Application function | Position control: reference dimension conversion (UU→LU) | It converts user-designated UU to position controller LU. |
| | Position control: locator curve planning | Used to set the locator parameters. |
| | Position control: position controller | Used to set position loop parameters and monitor position controller parameters. |
| | Position control: position feedback | Used to set the position feedback source and feedback conversion coefficient. |
| | Position control: position feedback dimension conversion (FU→LU) | It converts the load position FU to position controller LU. |
| | Position control: position feedback filtering | Used to set the filter parameter of position feedback. |
| | Position control: position start/stop | Used to set the positioning start/stop signal source, functions, and active mode. |
| | Position control: homing reset | Used to set the signal source, type, and trigger mode of homing. |
| | Position control: limit function | Used to set the source, action mode, and limit deceleration time of hardware position limit. |
| | Position control: multi-position command | Defines the multi-position operation mode. |
| | Position control: status monitoring | Used to set status monitoring parameters. |

| Module name | Interface name | Function description |
|---|---|---|
| Custom function block | Word-to-bit conversion function: word-to-bit module | Used to set the input/output parameters of word-to-bit function and monitor process data. |
| | Word-to-bit conversion function: bit-to-word module | Used to monitor the input/output parameters of word-to-bit function. |
| | Data type conversion function: data type conversion | Used to set the input/output parameters for data type conversion monitoring. |
| | Logical operation function: AND | Used to set the input/output parameters for function monitoring of logic AND. |
| | Logical operation function: NOT | Used to set the input/output parameters for function monitoring of logic NOT. |
| | Logical operation function: OR | Used to set the input/output parameters for function monitoring of logic OR. |
| | Logical operation function: XOR/XNOR | Used to set the input/output parameters for function monitoring of logic XOR/XNOR. |
| | Logical operation function: AND/OR | Used to set the input/output parameters for function monitoring of logic AND/OR. |
| | Logical operation function: delay | Used to set the input/output parameters for logic delay function monitoring. |
| | Word-to-double word conversion function: word-to-double word conversion | Used to set related parameters for word-to-double word conversion function monitoring. |
| | Word-to-double word conversion function: double word-to-word conversion | Used to set related parameters for double word-to-word conversion function monitoring. |

| Module name | Interface name | Function description |
| --- | --- | --- |
| Custom function block | Switch function: binary selector | Used to set the input/output parameters and selection parameters for binary selector monitoring. |
| | Switch function: numerical selector | Used to set the input/output parameters and selection parameters for digital selector monitoring. |
| | Control function: filter module | Used to set related parameters for filter function monitoring. |
| | Control function: level-to-pulse translation | Used to set related parameters for level-to-pulse conversion monitoring. |
| | Control function: pulse generator | Used to monitor the duty ratio, cycle, and output parameters of the pulse generator. |
| | Arithmetic function: absolute value module | Used to set the input/output parameters for absolute value module monitoring. |
| | Arithmetic function: addition and subtraction module | Used to set the input/output parameters for addition and subtraction module monitoring. |
| | Arithmetic function: multiplication and division module | Used to set the input/output parameters for multiplication and division module monitoring. |

| Module name | Interface name | Function description |
|---|---|---|
| Custom function block | Arithmetic function: comparison module | Used to set related parameters for comparison module monitoring. |
| | Multi-functional module: multi-point curve | Used to set the input/output parameters and point coordinate parameters for multi-point curve function monitoring. |
| | Multi-functional module: constant setting | Used to set the input/output function for constant setting module monitoring. |
| | Multi-functional module: parameter monitoring | Used to monitor the value of specific address. |
| | Multi-functional module: parameter modification | Used to set related parameters for parameter modification function monitoring. |
| | Multi-functional module: ramp module | Used to set related parameters for ramp module monitoring. |
| | Multi-functional module: load monitoring | Used to set related parameters for overload monitoring. |
| | Multi-functional module: pulse counting | Used to set related parameters for pulse counting monitoring. |
| | Multi-function module: gain module | Used to set related parameters for proportion module monitoring. |
| Power unit interface | V/f control function unit interface | Used to monitor the voltage and current parameters in V/f control mode. |
| | V/c control function unit interface | Used to monitor the voltage and current parameters and motor model parameters in V/f control mode. |
| Diagnosis | System status | Used to monitor the system status. |
| | Status/Control word | Used to monitor the status word/control word of the system. |

## 6.10 Graphical Programming

### 6.10.1Overview

Unlike the parameter interconnection system, graphical programming allows field secondary development applications to be more flexible, accessible, and widely applied. The graphical programming project consists of standard function blocks supported by the

AC drive and provides constants, connectors, and variables as system input sources for users to engage in project execution. It also provides corresponding output interfaces which can be mapped to speed reference and start/stop control for smart operation of the AC drive.

## 6.10.2Interfaces and Functions

The graphical programming interface mainly consists of the menu bar, canvas scaling, commissioning mode, editing area, and function block library.

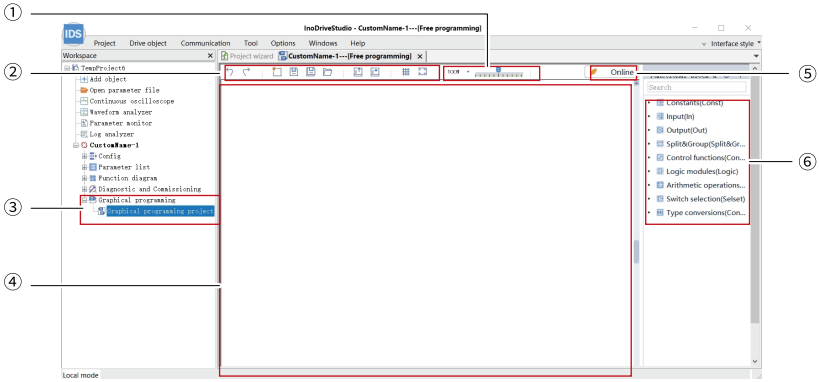



Figure 6-85 Graphical programming interface

| No. | Name |
|---|---|
| ① | Canvas scaling |
| ② | Quick access toolbar |
| ③ | Graphical programming |
| ④ | Configuration and editing area of graphical programming |
| ⑤ | Switch to debugging mode |
| ⑥ | Function block library |

- Quick access toolbar
  The menu bar presents some common editing options, as shown in the following table.

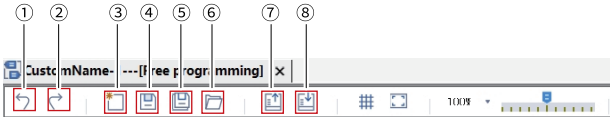



Figure 6-86 Quick access toolbar

Table 6–13 Options in the quick access toolbar

| No. | Name | Description |
|---|---|---|
| ① | Repeal | Used to undo the last change. |
| ② | Redo | Used to redo an undone action. |
| ③ | New | Used to create a canvas. |
| ④ | Save | Used to save the graphical programming project to the default storage path. |
| ⑤ | Save as | Used to save the graphical programming project to a custom path. |
| ⑥ | Load | Used to load the saved graphical programming project to the current canvas. |
| ⑦ | Upload | Used to read the valid graphical programming project in the device. |
| ⑧ | Download | Used to download the graphical programming project to the current device. |

- Canvas scaling
  The canvas scaling supports the following three functions.

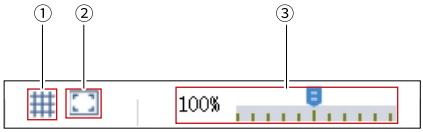



Table 6–14 Function description of canvas scaling

| No. | Name | Description |
|---|---|---|
| ① | Grid | Used to display the canvas grids for control alignment. |
| ② | Self adaptation | Used to adjust the canvas display proportion to 50%. |
| ③ | Canvas scale ratio | Used to adjust the canvas scale ratio. |

- Commissioning mode
  The commissioning mode supports online and offline states. When the graphical programming project is active and runs properly, you can click “Switch to online” to view the output terminal values of all function blocks in real time. Projects in the canvas cannot be edited in online state. If the project in the canvas needs to be edited, switch to the offline state.

- Editing area
  Perform graphical programming of the device in the editing area. Specifically, you can drag controls from the function block library to the editing area for parameter binding, perform serial connection of data flow among controls and input settings, and more.

- Function block library

The function block library contains all the controls available for graphical programming. You need to drag the controls from the function block library to the editing area for edit operations. The function block library supports the following major functions.

| Module | Function description |
|---|---|
| Constant | A constant consists of the Boolean value (BOOL), unsigned single word (U16), unsigned double word (U32), and floating-point value (F32). Set the constant input values within the specified range properly. The constant value can be applied repeatedly to different function blocks. |
| Input | The input module contains common inputs of the AC drive, including the single word connector (U16_Link_In), double word connector (U32_Link_In), bit connector (Bol_Link_In), Boolean variable (Boolean_Var_In), and numeric variable (Real_Var_In). |
| Output | Some output interfaces are reserved for the graphical programming function. You can use the graphical programming result as the OFF source, speed source, and communication parameter. The output module consists of the single word connector (U16_Out), double word connector (U32_Out), bit connector (Bool_Out), word connector per unit value (U16Per_Out), and double word connector per unit (U32Per_Out). |
| Divide and Combine | The Divide and Combine module is used to divide and combine words, bytes, and bits. It consists of sub-modules including single word-to-bit (W_b) conversion, bit-to-single word (b_W) conversion, byte-to-bit (By_b) conversion, bit-to-byte (b_BY) conversion, single word-to-byte (W_BY) conversion, byte-to-single word (BY_W) conversion, double word-to-word (DW_W) conversion, word-to-double word (W_DW) conversion, double word H-to-L byte conversion ((UPEND_W), and single word H-to-L byte conversion (UPEND_BY). |
| Control function | The control function module is mainly used for the control of input and output signals. It consists of sub-modules including switch-on delay (ON_DLY), switch-off delay (OFF_DLY), switch-on/switch-off delay (ON_OFF_DLY), pulse signal generator (PULSE), limit module (LIMIT), upper limit (LIMIT_UP), lower limit (LIMIT_LOW), and low-pass filter (FILTER). |
| Logic module | The logic module is mainly used for logic operations of some bool values. It consists of sub-modules including logic AND, logic OR, logic NOT, logic XOR, logic XNOR, and logic AND_OR. |
| Arithmetic operation | The arithmetic operation module consists of addition module, subtraction module, multiplication module, division module, absolute value module, addition and subtraction module, multiplication and division module, greater than comparison module, less than comparison module, and equal to comparison module. The active range for all output results is [-2147483648.0, 2147483647.0]. If the output result exceeds the upper limit, the output value is the upper limit. If the output result is smaller than the lower limit, the output value is the lower limit. |

| Module | Function description |
| --- | --- |
| Switch selection | The switch selection module mainly consists of binary selection and digital selection. |
| Type conversion | The type conversion module is mainly used for conversions of single word, double word, integer, long integer, and floating point. It consists of sub-modules including single word-to-float conversion, float-to-single word conversion, float-to-double word conversion, float-to-integral conversion, float-to-long integral conversion, integral-to-single word conversion, long integral-to-integral conversion, and long integral-to-double word conversion. |

# 7 Commissioning in Online Mode

This chapter describes InoDriveStudio connection with online devices, basic parameter settings, and device start/stop control.

## 7.1 Connection with Online Device

InoDriveStudio and the device can be connected in three modes, including USB (SOP-20/MDKE-10), TCP/IP (HETN-10/HPCU/HEIP-10/HPFN-20), and TCP/IP (HGW-10). This section describes how to use the SOP-20-880 smart operating panel and InoDriveStudio to commission MD880-50 series products. For commissioning of other devices, see the related manual.

The B-type mini USB terminal on the lower part of SOP-20-880 is used to connect to PC. For details, see descriptions of connection mode for SOP-20-880 in *" Connection" on page 41*. Select “USB relay mode” on the interface of SOP-20-880.

1. Double-click to open InoDriveStudio. The following interface appears.

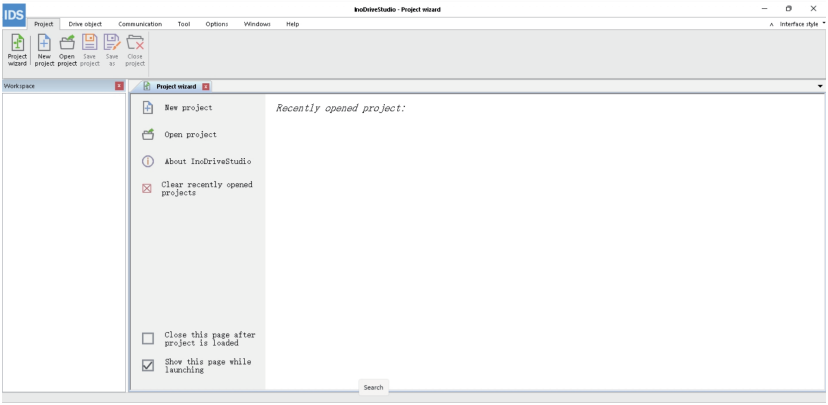



Figure 7-1 Start interface

2. Click “New project” to display the following interface.

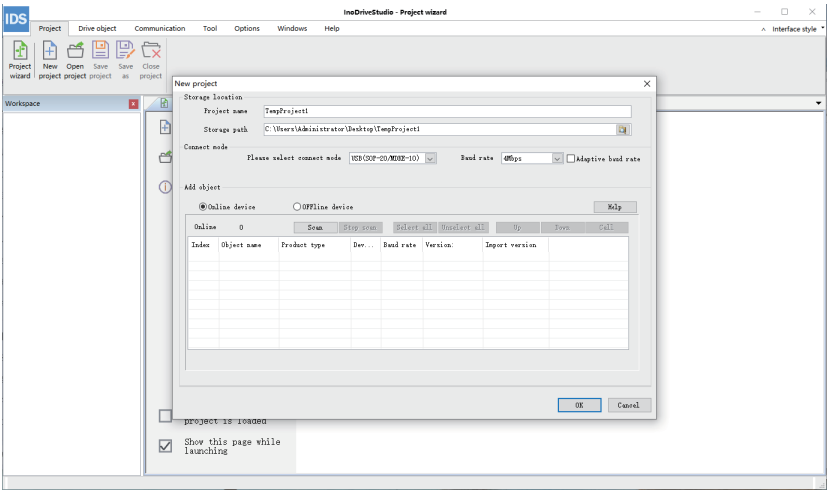



Figure 7-2 New project interface

3. Input the name of the project to be created in the “Project name”, and set the storage path to the directory where the project is stored. Set the connection mode to the default USB(SOP-20/MDKE-10). Select the baud rate of last setting. If the MD880-50 series product is connected for the first time, check “Adaptive baud rate”. Select “Online device” for “Add object”. Then, click “Scan”, as shown in the following figure.

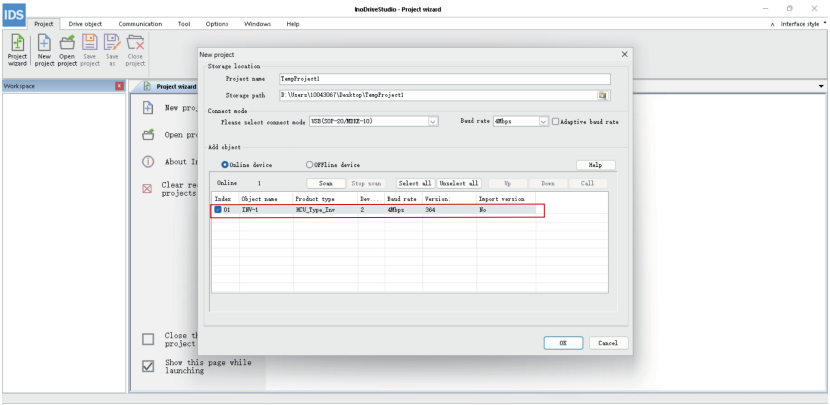



Figure 7-3 Scanning successful

4. When the product name is displayed in the online object box, the device has been scanned successfully. Click “OK”, and the device is connected successfully.
   If the following alarm is displayed after you click “Scan”,

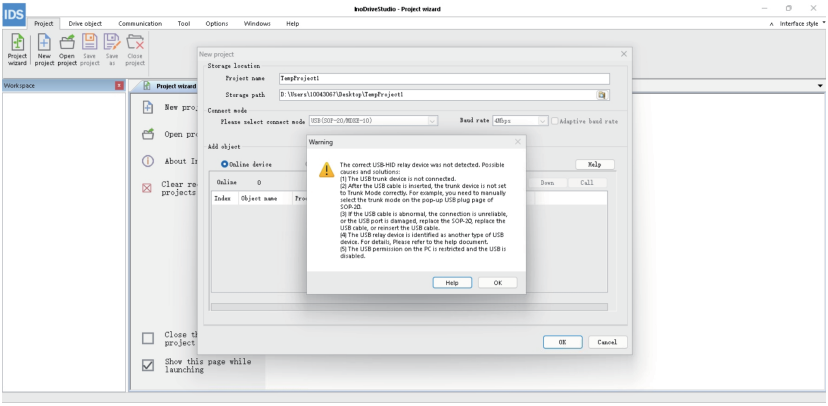



Figure 7-4 Scanning failed

The preceding figure shows that the SOP-20-880 operating panel is not detected by the software. Check whether “USB relay mode” is selected on the interface of SOP-20-880. Alternatively, re-connect the USB cable between the PC and SOP-20-880. Select “USB relay mode” for the USB connection mode. If the problem persists after the preceding operations, check whether the USB drive is displayed as “USB input device” under the PC device manager. If not, right-click on the displayed device and click “Update driver” to select “USB input device”.

## 7.2 Commissioning through the Control Panel

The device can be started and stopped in multiple modes including through parameter settings and control panel.

This chapter describes the start and stop of the motor through the control panel of InoDriveStudio. For other start/stop modes, see the corresponding product manual.

Before starting or stopping the device, ensure that no fault appears on the interface of InoDriveStudio. If a fault occurs, troubleshoot according to the corresponding product manual before commissioning the device.

1. Open the control panel. Then, go to “Diagnostic and Commissioning > Commissioning”, and double-click “Control panel”, as shown in the following figure.

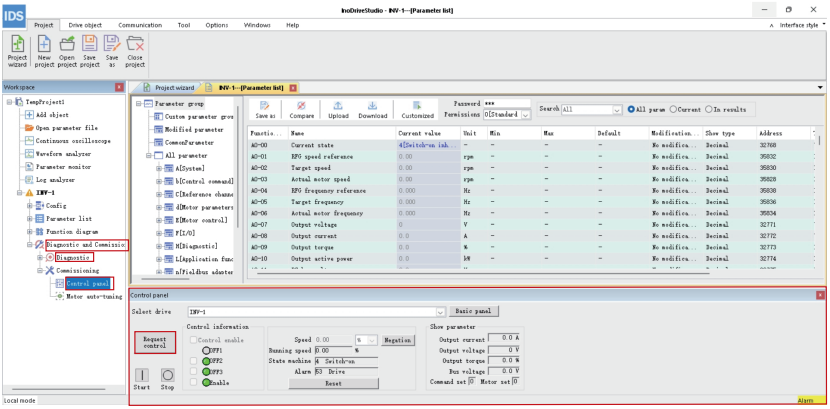


Figure 7-5 Control panel

2. When motor control is performed using the control panel, stop the motor to a standstill before operating the control panel. Click “Request control”, and the control panel obtains the motor control permission. In that case, parameter settings in the parameter list will not affect the start/stop of the device. The following figure shows the interface of the control panel.

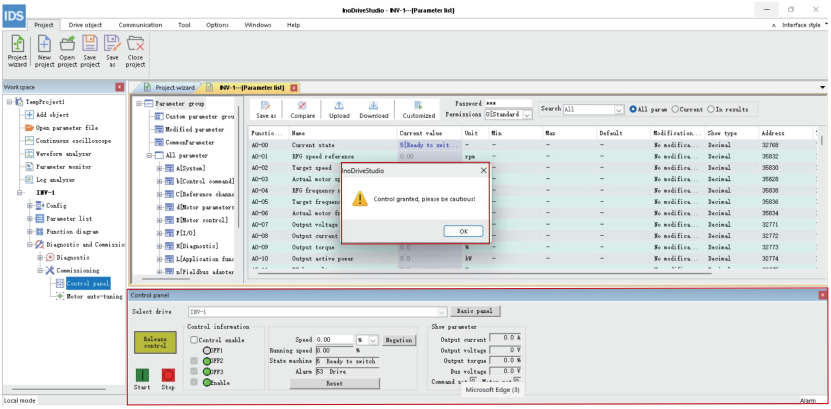


Figure 7-6 Control permission granted

3. Click “OK”. Verify that the state machine is displayed as “5 Ready to switch”, indicating that the device is ready to start. Set the speed to 10%, and click “Start” to start the motor, as shown in the following figure.

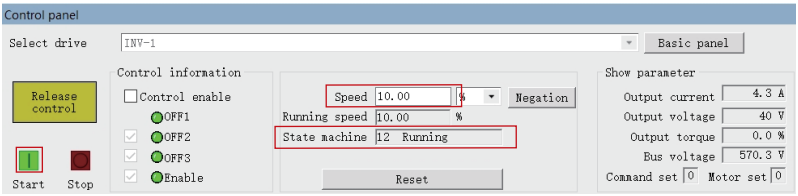



Figure 7-7 Start through the control panel

4. Click “Stop”, and the motor decelerates to stop. The state machine displays “13 OFF1 stop”, as shown in the following figure.

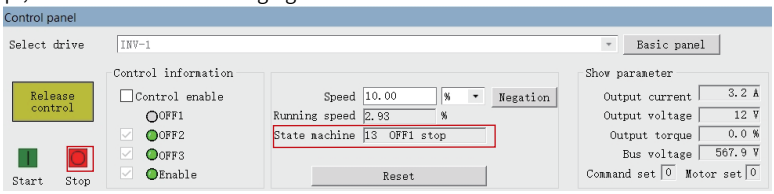



Figure 7-8 Stop through the control panel

5. After the motor comes to a standstill, the state machine displays “5 Ready to switch”, as shown in the following figure.

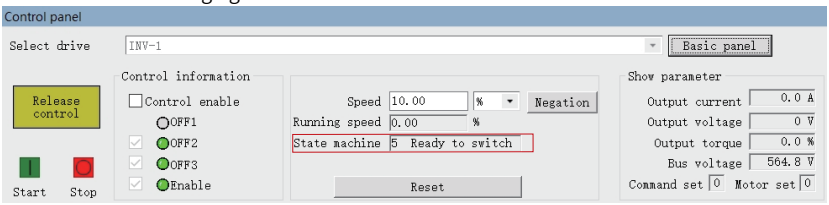
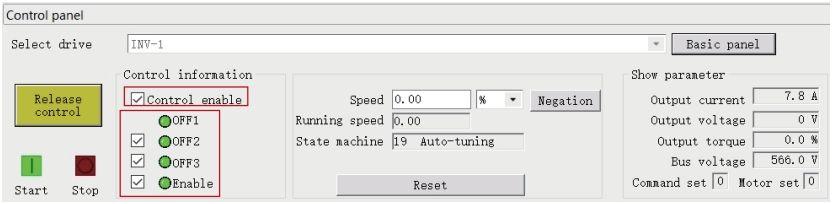
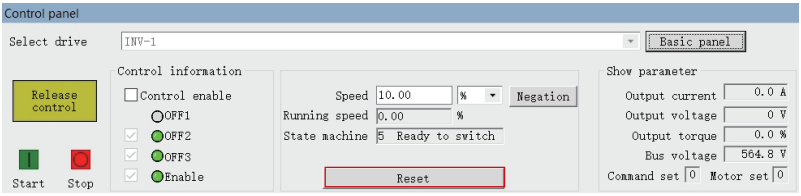



Figure 7-9 Motor at a standstill

6. After the “Input control bit” is checked, you can click “OFF1”, “OFF2”, “OFF3”, and “Enable” to switch the control word directly, thus achieving start/stop control of the device.




7. Click the space key consecutively for three times to automatically trigger the OFF2 stop command.
8. After the drive is started using the control panel and the communication between the HCU controller and InoDriveStudio fails, fault 52- 1 is reported.
9. Click “Reset” to reset the fault.




The control panel can be switched to a basic panel that supports a floating window option. Click “Basic panel” and double-click the blue title bar of the control panel. The control panel automatically turns to a floating window which allows you to start/stop the motor and set parameters at the same time.

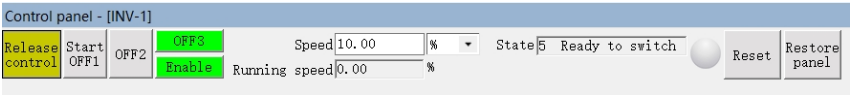



Figure 7-10 Basic control panel

## *Note*

To start/stop the motor through parameters in the parameter list, stop the motor through the control panel first. After the motor is at a standstill, click “Release control” in the control panel. Wait until the button is grayed out.

# 8 Operation in Offline Mode

This chapter describes the creation of an offline project on InoDriveStudio, conversion of offline project to online project, parameter modification, and parameter download to an online device.

## 8.1 Creating an Offline Project

InoDriveStudio supports offline project creation. You can create a project without device connection to modify parameters and view the functions.

1. Double-click  to open InoDriveStudio. The following interface appears.

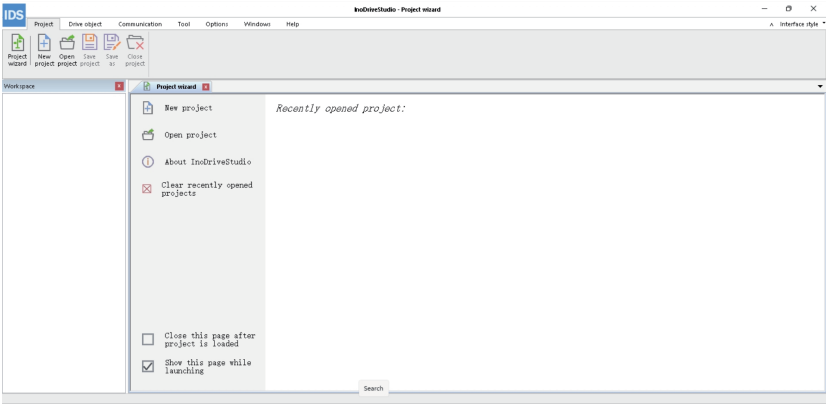



Figure 8-1 Start interface

2. Click “New project” to display the following interface.

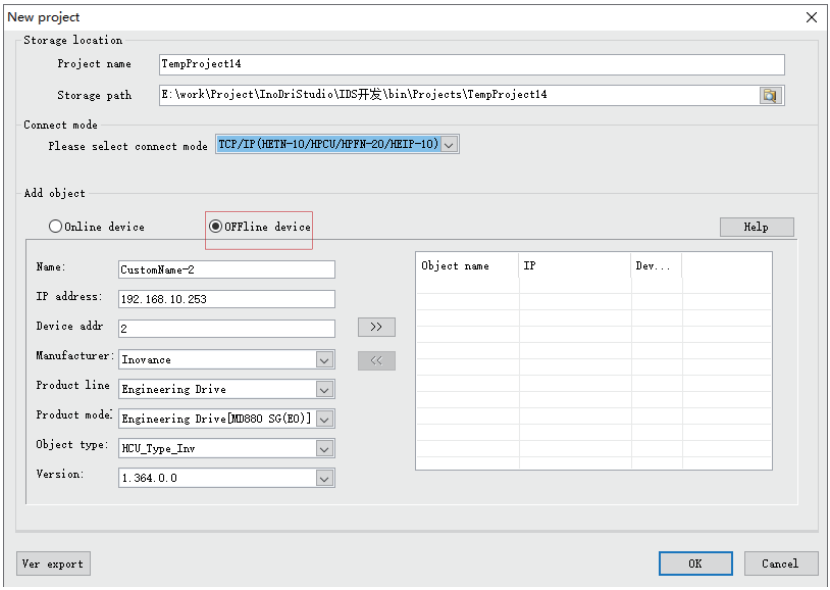



Figure 8-2 New project interface

3. Select “OFFline device” for “Add object”, as shown in the following interface.

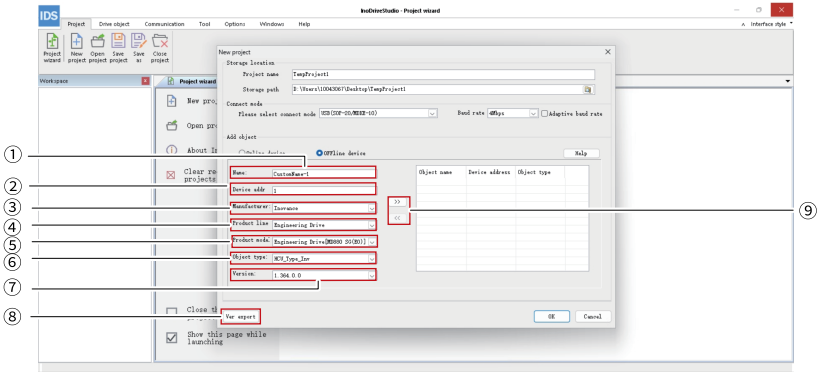



Figure 8-3 Offline device interface

Table 8–1 Configuration items for new offline device

| No. | Name | Description |
|---|---|---|
| ① | Name | Indicates the name of the offline device. |
| ② | Device address | Indicates the station number of the offline device. |
| ③ | Manufacturer | Indicates the manufacturer of the offline device. |
| ④ | Production line | Indicates the production line type of the offline device. |

| No. | Name | Description |
|---|---|---|
| ⑤ | Product mode | Indicates the product mode of the offline device. |
| ⑥ | Object type | Indicates the type of the offline device. For example, inverter, active rectifier, and feedback rectifier. |
| ⑦ | Version | Indicates the imported parameter version of the offline device. |
| ⑧ | Version export | Used to export information including the manufacturer, product line, product series, device model, and parameter version. |
| ⑨ | Right/left arrow | It is used to import/delete the configured offline device. Click the right arrow to import the configured offline device. Click the left arrow to delete the selected offline device. |

The following table lists the products supported by the software in Chinese version. Actual supported products may vary.

Table 8–2 Products supported by InoDriveStudio in Chinese version

| Manufacturer | Production line | Product mode | Object type | Description |
|---|---|---|---|---|
| Inovance | Engineering drive | MD880 series | HECU_Inverter | A0 model: Standard inverter |
| | | | HECU_AFE_Rectifier | A0 model: Active rectifier |
| | | | HECU_T2_Rectifier | A0 model: Basic rectifier |
| | | | HECU_SMART_Rectifier | A0 model: Regenerative rectifier |
| | | | HECU_BRAKE_Inverter | A0 model: Braking unit |
| | | | HECU_DCDC_Rectifier | A0 model: DC chopper |
| | | | HECU_POWER_Inverter | A0 model: Shore power supply |
| | | | HPCU_Inverter | A0 model: Parallel module |
| | | | MD880_Brake_Single | A0 model: Single-phase braking |

| Manufacturer | Production line | Product mode | Object type | Description |
|---|---|---|---|---|
| Inovance | Engineering drive | MD880 Mini | MD880-mini-INV | MD880 mini controller |
| | | MD880 SG | HCU_Inverter | B0 version: Standard inverter |
| | | HGW series | HGW-10 | MD880 gateway component |
| | | MD880 HS | HCU(HS)_Inverter | MD880 high speed controller |
| | | CD21 series | CD21_INV | CD21 controller |
| | | MD880 SG series | HCU_Type_Inv | C0 model: Standard inverter |
| | | | HCU_Type_AFE | D0 model: Active rectifier |
| | | | HCU_Type_T2 | D0 model: Basic rectifier |
| | | | HCU_Type_SMART | D0 model: Regenerative rectifier |
| | | | HCU_Type_DC-DC | D0 model: DC chopper |
| | | MD580 series | MD580-INV | MD580 controller |
| | | MD880: SG (E0) | HCU_Type_Inv | E0 model: Standard inverter |
| | | | HCU_Type_AFE | E0 model: Active rectifier |
| | | | HCU_Type_T2 | E0 model: Basic rectifier |
| | | | HCU_Type_SMART | E0 model: Regenerative rectifier |
| | | | HCU_Type_DC-DC | E0 model: DC chopper |
| | | | HCU_Type_BRAKE | E0 model: Braking unit |
| | | | HCU_Type_PCS | E0 model: PCS |
| | | | HCU_Type_DC-DC/BTP | E0 model: Battery pack test power supply |
| | | MD880 HS (E1) | HCU_Type_Inv_HS | E1 model: High speed inverter |
| | High voltage drive | HD3x_HCU series | HD3x_HCU_INV | HD3x series high-performance medium-voltage AC drive |
| | | | HD3x_HCU_ARC | |
| | | | HD3x_HCU_DRC | |

The following table lists the products supported by the software in English and other language versions. Actual supported products may vary.

Table 8–3 Products supported by InoDriveStudio in English version

| Manufacturer | Production line | Product mode | Object type | Description |
|---|---|---|---|---|
| Inovance | Engineering drive | HGW series | HGW-10 | MD880 gateway component |
| | | MD880 SG series | HCU_Type_Inv | C0 model: Standard inverter |
| | | | HCU_Type_AFE | D0 model: Active rectifier |
| | | | HCU_Type_T2 | D0 model: Basic rectifier |
| | | | HCU_Type_SMART | D0 model: Regenerative rectifier |
| | | | HCU_Type_DC-DC | D0 model: DC chopper |
| | | MD580 series | MD580-INV | MD580 controller |
| | | MD880: SG (E0) | HCU_Type_Inv | E0 model: Standard inverter |
| | | | HCU_Type_AFE | E0 model: Active rectifier |
| | | | HCU_Type_T2 | E0 model: Basic rectifier |
| | | | HCU_Type_SMART | E0 model: Regenerative rectifier |
| | | | HCU_Type_DC-DC | E0 model: DC chopper |
| | | | HCU_Type_BRAKE | E0 model: Braking unit |
| | | | HCU_Type_PCS | E0 model: PCS |
| | | | HCU_Type_DC-DC/ BTP | E0 model: Battery pack test power supply |
| | | MD880 HS (E1) | HCU_Type_Inv_HS | E1 model: High speed inverter |

4. Set the name, device address, product line, product mode, object type, and parameter version for the offline device as required. For example, set the product mode to MD880 SG(E0), object type to HCU_Type_Inv, parameter version to 1.345.0.0, as shown in the following figure. Click “>>” to import the configured project. Then, click “OK”, and the offline project is created.

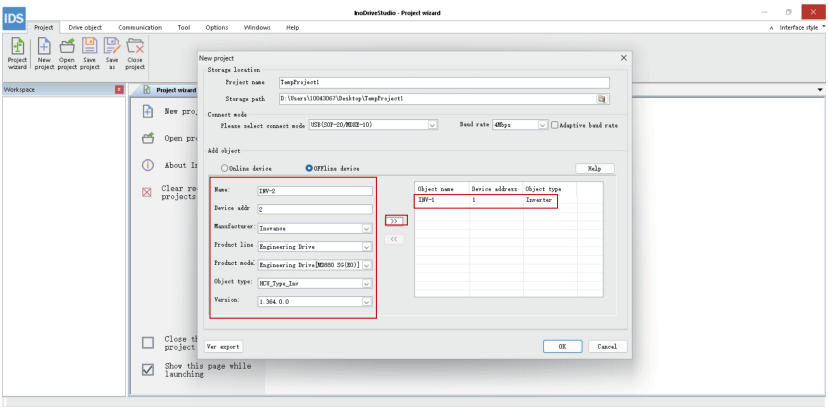


Figure 8-4 New offline device

5. You can import multiple offline devices at a time for the offline project. After the offline device is imported, you can left-click on a specific object name in the display area to edit and modify the name of the device.

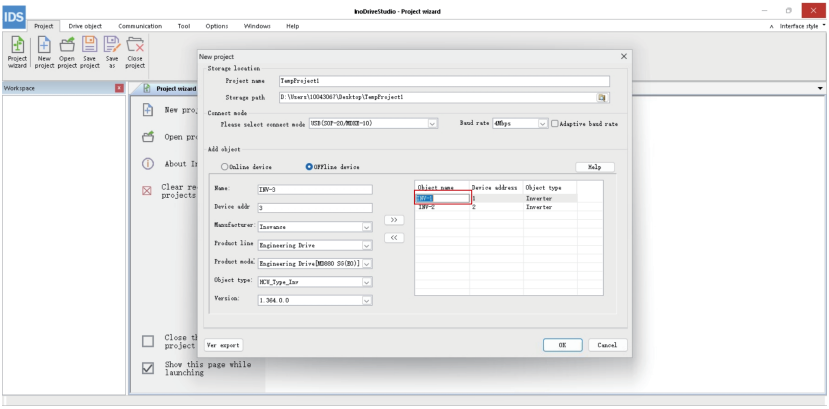


Figure 8-5 Editing the object name of the imported offline device

6. Left-click the device address in the display area to edit and modify the station number of the device.

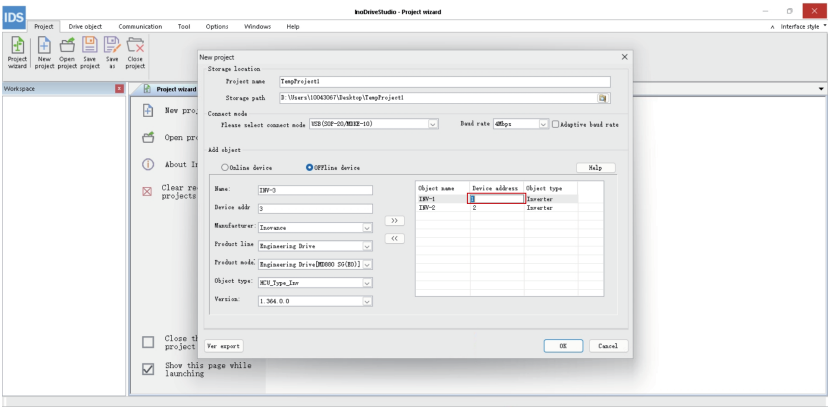


Figure 8-6 Editing the device address of the imported offline device

7. Click OK to create a project. The controller can be connected to the PC through SOP-20. To delete an imported offline project, right-click on the imported project and click "<<" to delete the imported project.

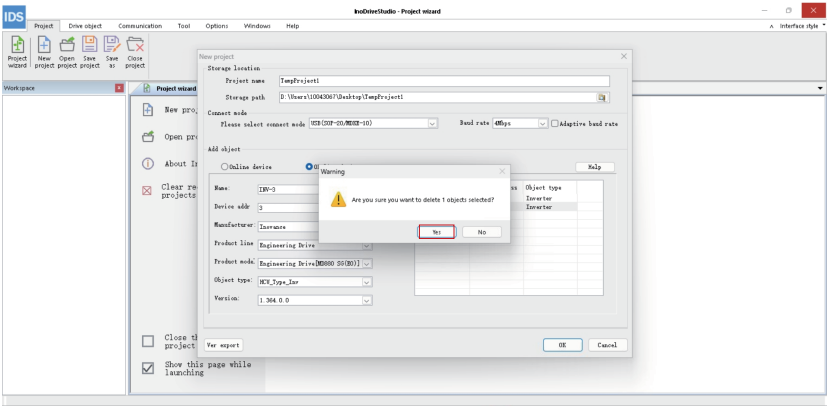


Figure 8-7 Deleting an imported project

## 8.2 Converting an Offline Project to an Online Project

1. The following figure shows the interface of a new offline project.

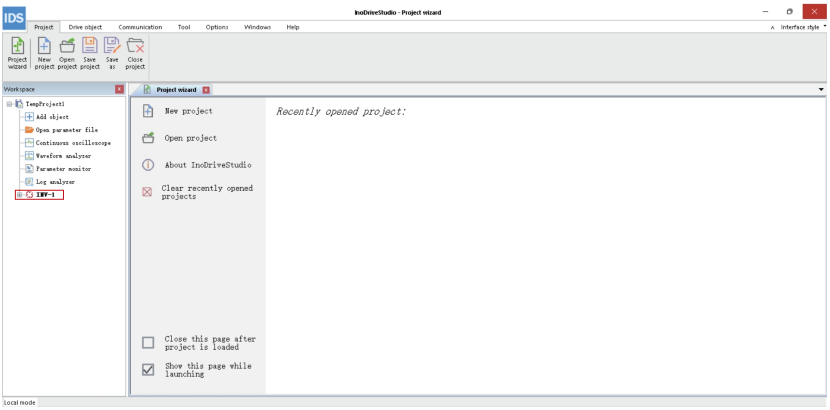



Figure 8-8 Offline project interface

2. After an offline project is created, if a device of the same model and parameter version is connected to the PC through SOP-20 relay mode, right-click on the device name. Next, select “Connect” in the context menu. The offline project is then converted to an online project, as shown in the following figure.

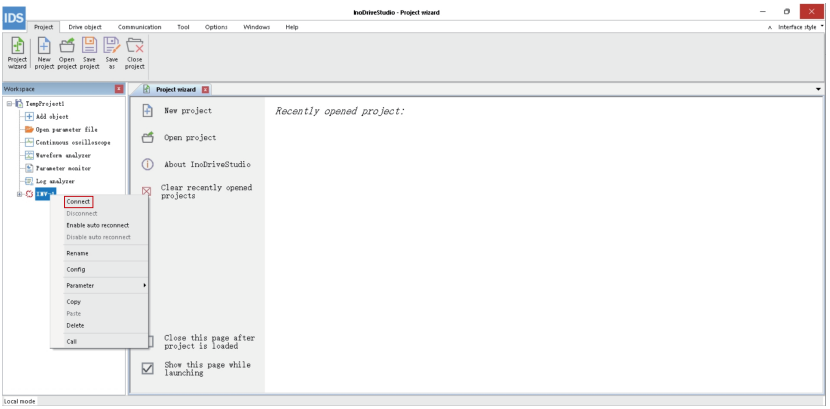



Figure 8-9 Offline project converted to online project

3. After that, the project icon changes to . You can proceed with online device commissioning. The following figure shows the interface of an online project.

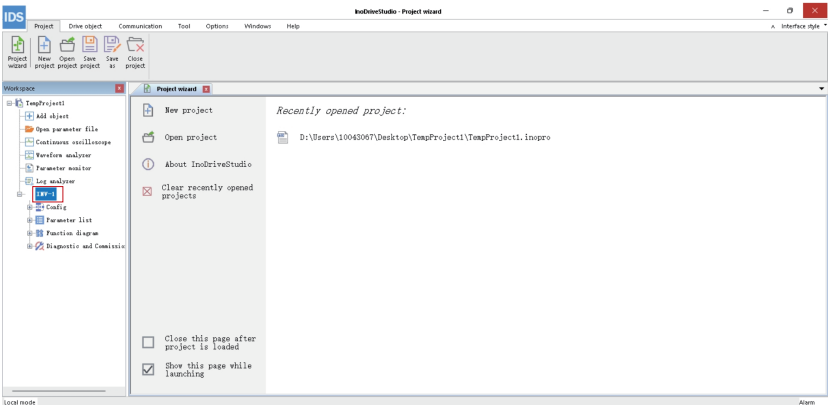



Figure 8-10 Online project

## 8.3 Modifying the Offline Project

Application scenario: If a specific parameter on site needs to be modified by a professional with no proper hardware at hand, one solution is to create an offline project of the same model and parameter version on the InoDriveStudio, modify and save the parameter as a parameter file, and send the file to personnel on site. Then, the personnel on site download the received parameter file to the online device.

1. Modify the parameters as required in the parameter list under the offline project created. For example, to modify parameters of control channel, reference channel, and motor, set A9-00 (Command channel source) to “1 [Command channel 2]”, b2-00 (Start/stop control word source) to “3 [User-defined (group b2)]”, b2-01 (User-defined OFF1 source) to “3 [DI2]”, d0-01 (Rated motor power) to “7.5”, and d0-09 (Motor pole pairs, number of pole pairs/2) to “2”. Double-click “Modified parameter” to display all the parameters modified, as shown in the following figure.

| Function code | Name | Current value | Unit | Min | Max | Default | Modification mode | Show type | Address | Type | Descr |
|---|---|---|---|---|---|---|---|---|---|---|---|
| A4-02 | Carrier frequency setting | 3.20 | kHz | 1.20 | 8.00 | 1.25 | Free modification | Decimal | 49 | UINT16 | |
| A4-27 | Module pre-overtemperature t... | 10 | ℃ | 0 | 60 | 5 | Free modification | Decimal | 2913 | UINT16 | |
| A10-03 | SOF-20/Relay communication a... | 2 | - | 1 | 127 | 1 | Free modification | Decimal | 88 | UINT16 | |
| A12-05 | Trigger mode of trigger cond... | 2[By digital] | - | 0 | 6 | 0 | Free modification | Decimal | 1870 | UINT16 | |
| A12-08 | Digital selection of trigger... | U0-02[DI1] | - | 0 | 0 | 0 | Free modification | Decimal | 1873 | UINT16 | |
| A12-20 | Number of trigger oscilloscо... | 5 | - | 0 | 50 | 1 | Free modification | Decimal | 1935 | INT16 | |
| A12-21 | Trigger oscilloscope channel... | 1500 | - | 1000 | 3999 | 1000 | Free modification | Decimal | 1885 | INT16 | |
| A12-22 | Trigger oscilloscope channel... | 1504 | - | 1000 | 3999 | 1000 | Free modification | Decimal | 1886 | INT16 | |
| A12-23 | Trigger oscilloscope channel... | 1514 | - | 1000 | 3999 | 1000 | Free modification | Decimal | 1887 | INT16 | |
| A12-24 | Trigger oscilloscope channel... | 1522 | - | 1000 | 3999 | 1000 | Free modification | Decimal | 1888 | INT16 | |
| A12-25 | Trigger oscilloscope channel... | 1525 | - | 1000 | 3999 | 1000 | Free modification | Decimal | 1889 | INT16 | |
| C5-00 | JOG 1 setpoint | 20.0 | % | -50.0 | 50.0 | 10.0 | Free modification | Decimal | 183 | INT16 | |
| C5-01 | JOG 2 setpoint | -0.1 | % | -50.0 | 50.0 | -10.0 | Free modification | Decimal | 184 | INT16 | |
| C5-02 | JOG acceleration time | 5.0 | s | 0.1 | 1000.0 | 10.0 | Free modification | Decimal | 185 | UINT16 | |
| C5-03 | JOG deceleration time | 5.0 | s | 0.1 | 1000.0 | 10.0 | Free modification | Decimal | 186 | UINT16 | |
| d0-01.0 | Rated motor power | 7.5 | kW | 0.1 | 6553.5 | 3.7 | Modification at ... | Decimal | 237 | UINT16 | |
| d0-01.1 | Rated motor power | 7.5 | kW | 0.1 | 6553.5 | 3.7 | Modification at ... | Decimal | 238 | UINT16 | |
| d0-01.2 | Rated motor power | 7.5 | kW | 0.1 | 6553.5 | 3.7 | Modification at ... | Decimal | 239 | UINT16 | |
| d0-01.3 | Rated motor power | 7.5 | kW | 0.1 | 6553.5 | 3.7 | Modification at ... | Decimal | 240 | UINT16 | |
| d0-02.0 | Rated motor voltage | 400 | V | 1 | 1500 | 380 | Modification at ... | Decimal | 241 | UINT16 | |
| d0-02.1 | Rated motor voltage | 400 | V | 1 | 1500 | 380 | Modification at ... | Decimal | 242 | UINT16 | |

Figure 8-11 Modified parameter interface

2. Click “Save” to save the parameter file, as shown in the following figure.

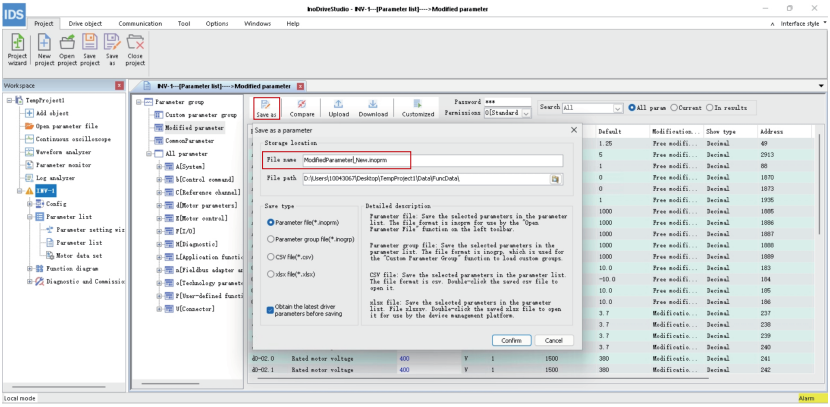


Figure 8-12 Saving the parameters

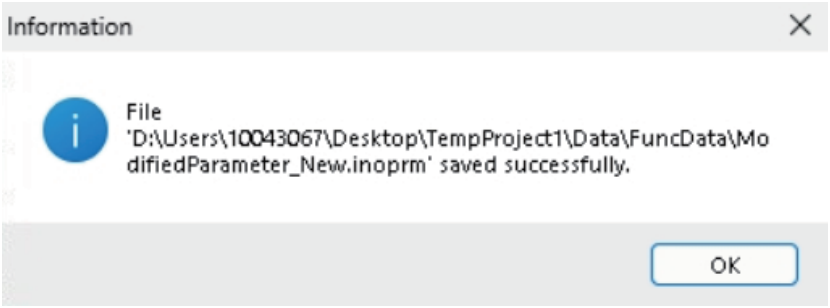



Figure 8-13 Prompt after parameters are saved successfully

The saved parameter file is shown as: 

.

## 8.4 Downloading Parameter Files

The following figure shows the interface of connection with a device of the same model and parameter version as that of the offline project.

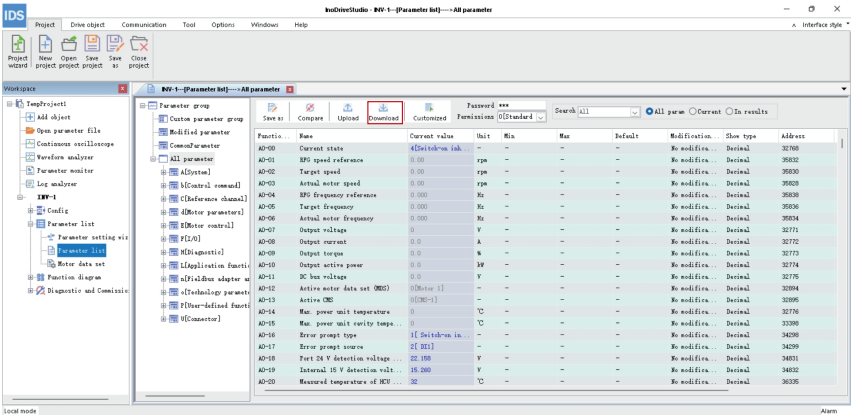


Figure 8-14 Online project

1. Click “Download” to download the saved parameter file to the device. Check “Download part” and “Download motor parameter” in sequence. If no motor parameter is modified, uncheck “Download motor parameter” to protect motor parameters of the original device. For details, see the following figure.

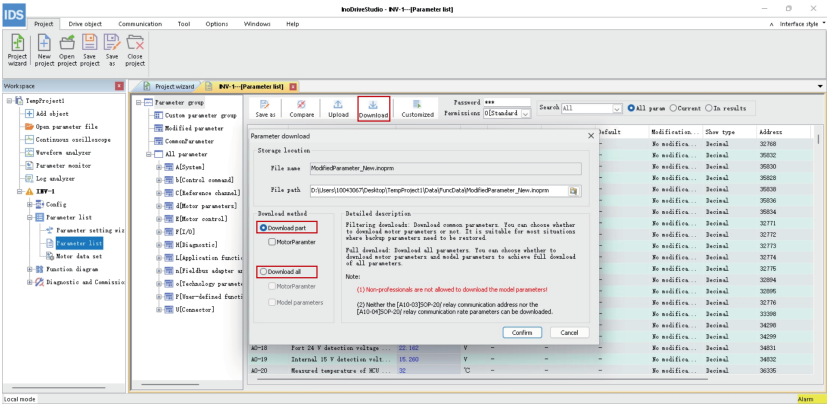


Figure 8-15 Parameter download interface

2. Click “Confirm” to display the parameter file selection interface. After selecting the parameter file properly, download the parameters. Wait until the parameter download is completed.

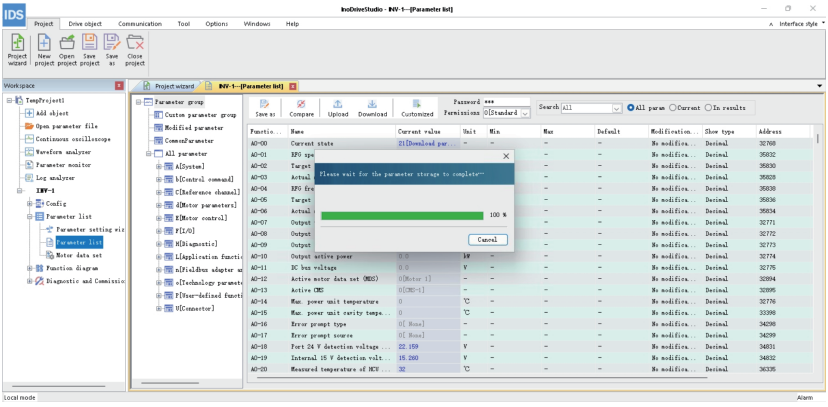


Figure 8-16 Parameter being downloaded

3. After the parameter is downloaded, double-click "Modified Parameters" or right-click "Update Modified Parameters" and wait for the parameters to refresh. Parameters that are downloaded and different from the factory values are displayed on this interface, as shown in the following figure:

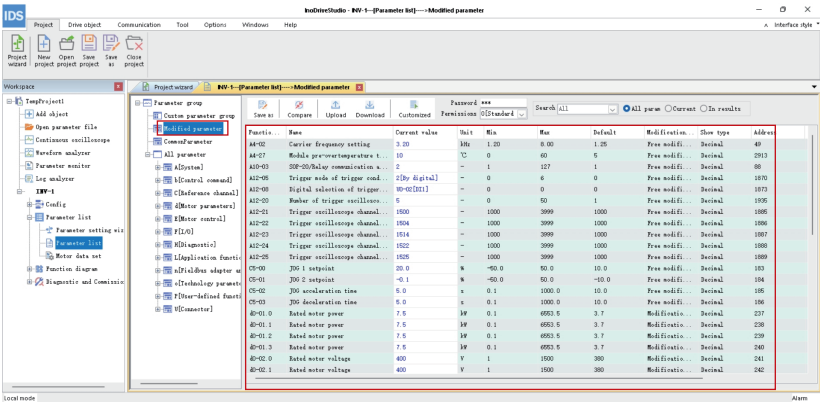


Figure 8-17 Downloaded parameter interface

# 9 User Permission

After the software is installed for the first time, double-click InoDriveStudio.exe to display the “Authorized installation tool” interface which presents four user permissions including ordinary permission, advanced privileges, expert authority, and manufacturer’s authority.

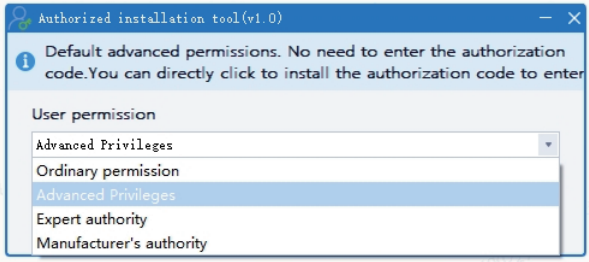



Figure 9-1 User permission

The following table lists four user permissions.

| Permission | Function supported | Remarks |
|---|---|---|
| Ordinary permission | Parameter list, access to parameter files, parameter monitoring list, faults and alarms, continuous oscilloscope, and control panel | Internal channel parameters of Inovance in the continuous oscilloscope are unaccessible. |
| Advanced privileges | All functions | Specifically, internal channel parameters of Inovance in the continuous oscilloscope, waveform analyzer, black box, and trigger oscilloscope are unaccessible. |
| Expert authority | - | Unaccessible yet |
| Manufacturer’s authority | All functions | - |

The default user permission is “Advanced Privileges” which requires no need to enter the authorization code. You can directly click “Install authorization code”.

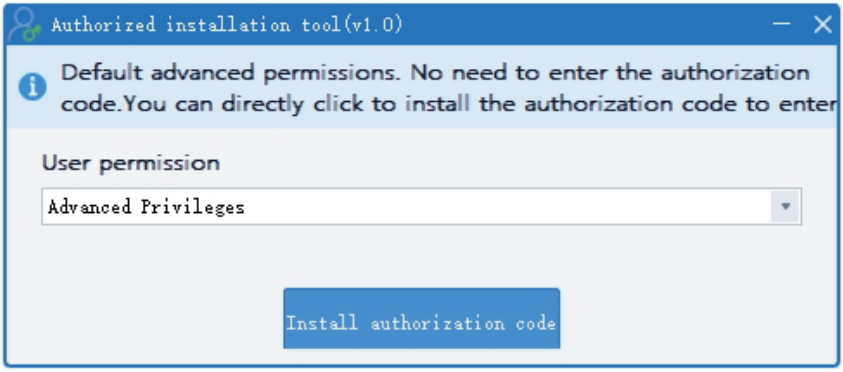



Figure 9-2 Advanced privileges

To switch between the permissions, copy and send the machine code to Inovance technical support, and you will get a returned authorization code. Then, paste the code in the following area, and click “Install authorization code”.

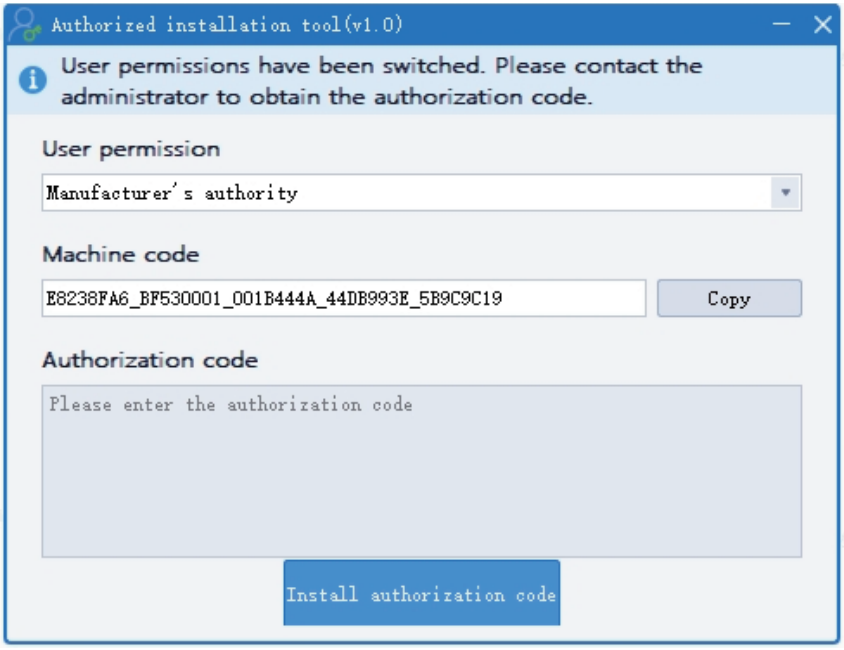



Figure 9-3 Authorized installation

To switch between the permissions after the software is installed based on “Advanced Privileges”, choose “Tool > Authorization management”.

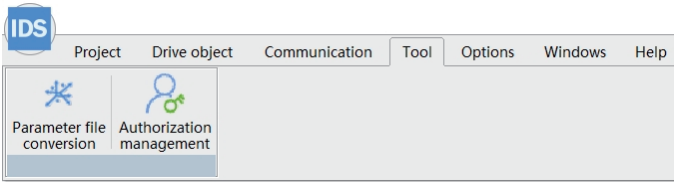



Figure 9-4 Authorization management

Then, the “Authorized installation tool” interface appears. Select the user permission as required, enter the authorization code, and click “Install authorization code” to switch between the permissions.

## *Note*

Once switched to a new permission, the previous permission gets invalid. The authorization code can be used only once. Any permissions can be switched to “Advanced Privileges”.




Figure 9-5 Switching between the permissions

PS00018559A00

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