VEICHI

Manual

VCACSoft

Preface

Thank you for using VCACSoft, the upper computer debugging software independently developed and designed by VEICHI.

VCACSoft adopts modular design, which can meet the online debugging and monitoring of multiple drives. Its new visual interface is versatile and user-friendly, featuring good use experience. and can be widely used for engineering transmission products debugging such as AC drives and AC800 multi-drive systems.

Veichi reserves the right to continuously improve the product, and at the same time update the content in the corresponding manual, on which, Veichi also has the final interpretation right.

If there are doubts about some functions and performance, please consult our support staff.

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Version Change Log

Date	Version	Content
2024.08	V1.1	Added free programming-related functions
2024.02	V1.0	First version issued

Chapter 1 Introduction

1.1 Definition

VCACSoft debugging software is independently developed by VEICHI Electric with completely intellectual property rights. With modular design, it is an upper computer software integrating management and debugging for online debugging and monitoring of multiple drives.

1.2 Functions

- A visual interface to improve use experience.
- Easy management of multiple drives.
- Online debugging/offline editing with parameter wizard debugging and function flow diagram debugging.
- Flexible switching of RS485, USB and Ethernet communication modes to ensure good communication.
- Multi-channel high-speed sampling and analysis (oscilloscope) for real-time data analysis.
- Fault and black box, and fault reports for efficient and accurate fault diagnosis.
- Multiple devices monitored on the same screen for timely identification of equipment risks.
- Precise auto-tuning of motor parameters for accurate control.

1.3 Application

VCACSoft is mainly used for debugging, fault diagnosis, running status monitoring and data analysis of multi-drive products such as AC800/AC810/AC830.

1.4 Functions

No.	Name	Description
1	Project/Device management	To create and manage projects and devices.
2	Communication management	To manage communication among devices.
3	Read/Write parameters	To manage offline and online device parameters including read, write, import, export and view.
4	Real-time monitoring	To manage and monitor the real-time status of device parameters.
5	Troubleshooting	To visually analyze device failures.
6	Oscilloscope	To manage high-speed sampling device data and analyze through waveform.
7	Parameter guide	Intuitive UI interface to guide customers to set up and debug.
8	Function flow	Graphical process to guide customers to debug quickly.
9	Black box	To manage the data obtained from the black box, and generate diagnosis curve for further analysis.
10	Motor auto-tuning	To complete auto-tuning according to motor parameter settings.

Chapter 2 Quick Debugging Guide

2.1 Preparation

2.1.1 Environmental Requirements

PC Hardware	
Memory	≥4G
Hard disk	≥10G
CPU	Core i3 and above, ADM R3 and above
Software	
OS	WINDOWS 7/8/10/11
Software framework	. NET Formwork 3.5 and above
USB driver	Driver program provided by VEICHI
Accessories	
Communication cable	Type-C to USB *1 Or RS485 to USB tool *1

2.1.2 Software Download

https://www.veichi.cn/service/datadownload/

Please enter "VCACSoft" in the search box to download it.

2.1.3 USB Driver Installation

Steps (take WINDOWS 10 as an example)

1. Right-click "Start" , select "Device Manager" or right-click "My Computer", select "Management", and select "System Tools > Device Manager" in the pop-up interface.

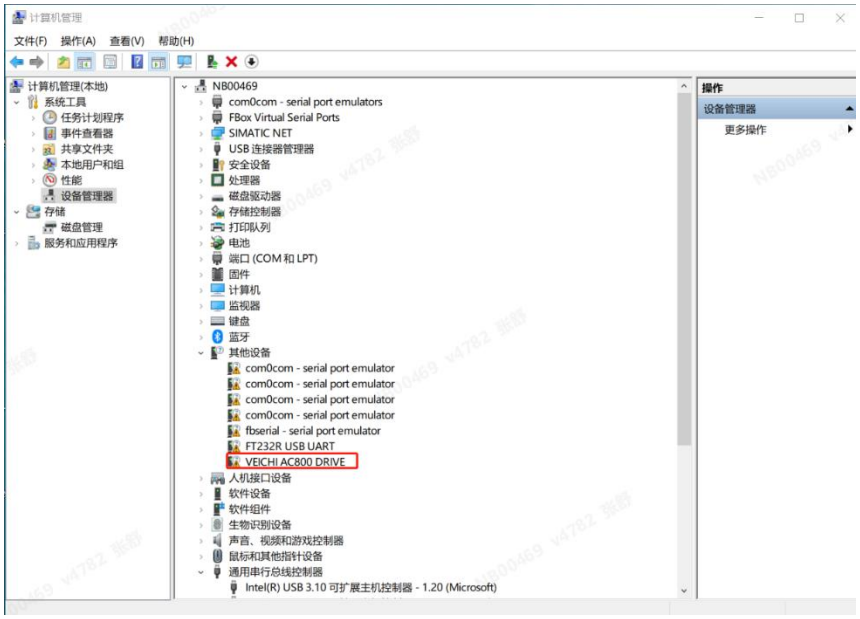


Figure 2-1 Main Interface

2. Double-click VEICHI AC800 DRIVE, select the General tab, and click Update Driver.



Figure 2-2 Update Driver

3. Select ”Browse my computer to find drivers (R)”.

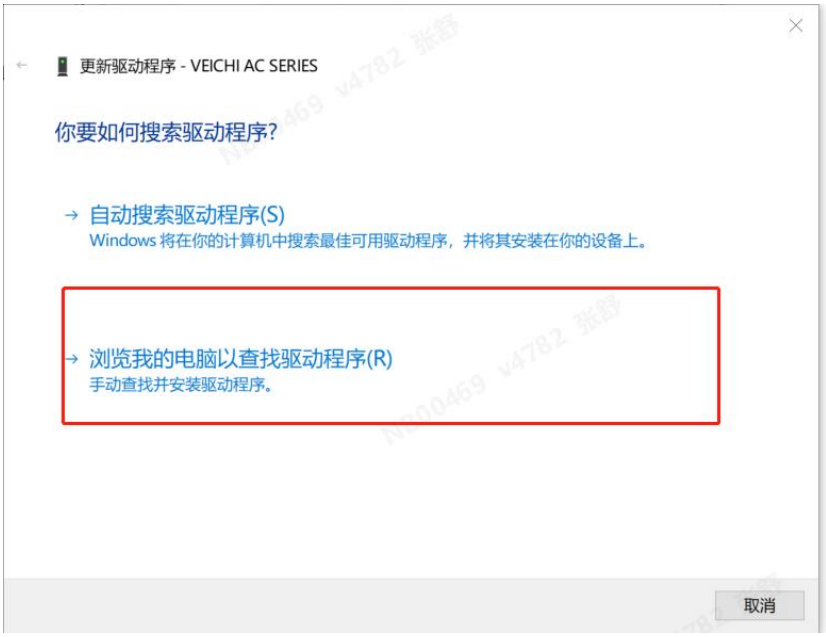


Figure 2-3 Find Driver

4. Click "Browse (R) …", select "…\ USBDrivers\ AC\ Win10" under the software storage directory, and click "Next".



Figure 2-4 Select Storage Directory

5. Check that the update is complete.

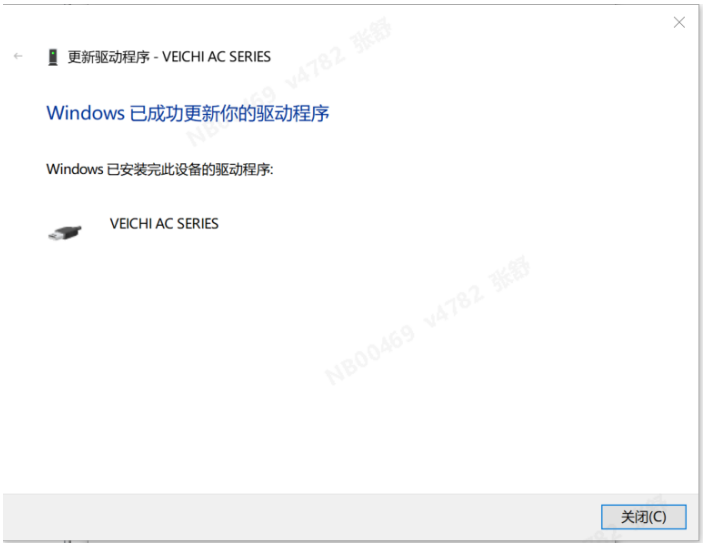


Figure 2-5 Update Completed

2.1.4 Software Installation

VCSoft debugging software is installation-free, download and unzip and click on 

to run it.

2.2 Main Interface

Double click on 

, and the interface is shown as below:



Figure 2-6 Main Interface

2.3 Project Maintenance

2.3.1 New Project

Take the new AC800 inverter project as an example.

Steps

1. Click "Project" in the menu bar, select "New Project" or click "Start Page" in the toolbar, select "New Project" on the left side of the page, fill in the project name, and click "Next".

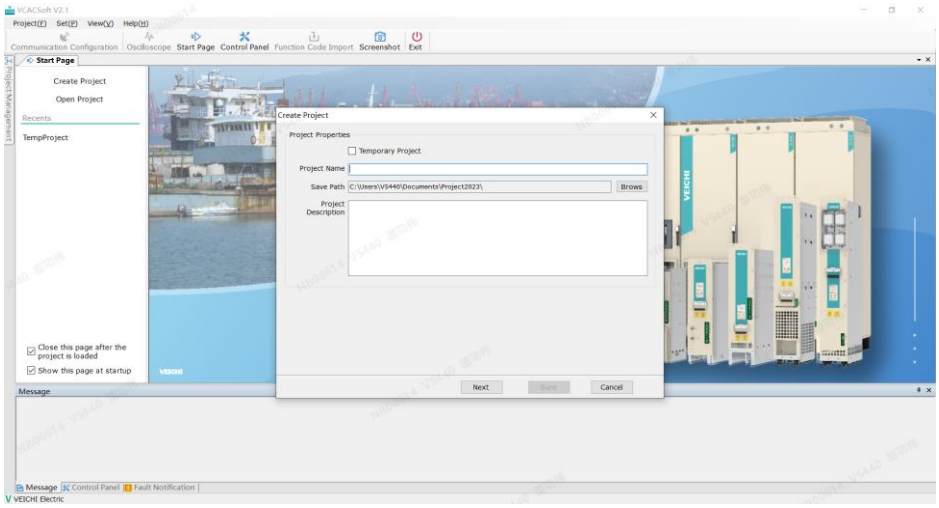


Figure 2-7 Create A New Project

2. Refresh the COM port and set the baud rate (choose “Adaptive” if the baud rate is uncertain) and data format.

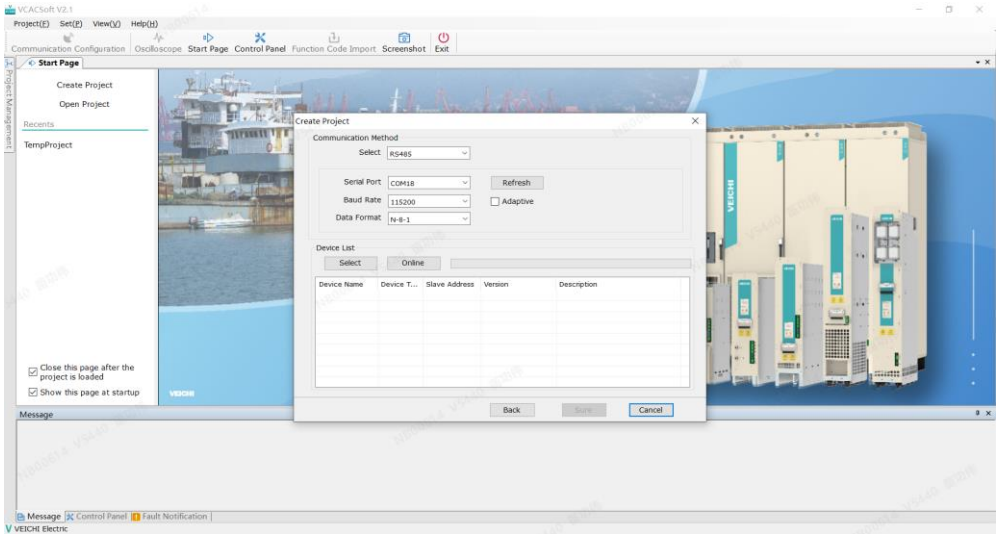


Figure 2-8 Set the Communication Method

3. Click on "Select Offline Device" to select “Inverter”

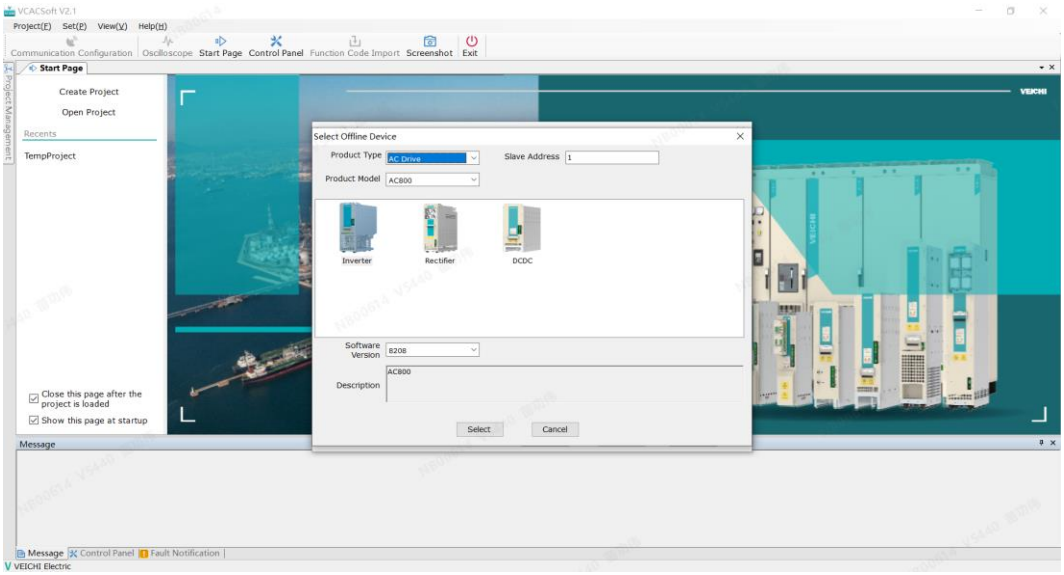


Figure 2-9 Select the Offline Device

4. Click "Search Online". If the PC is connected to the device, this method will work too.

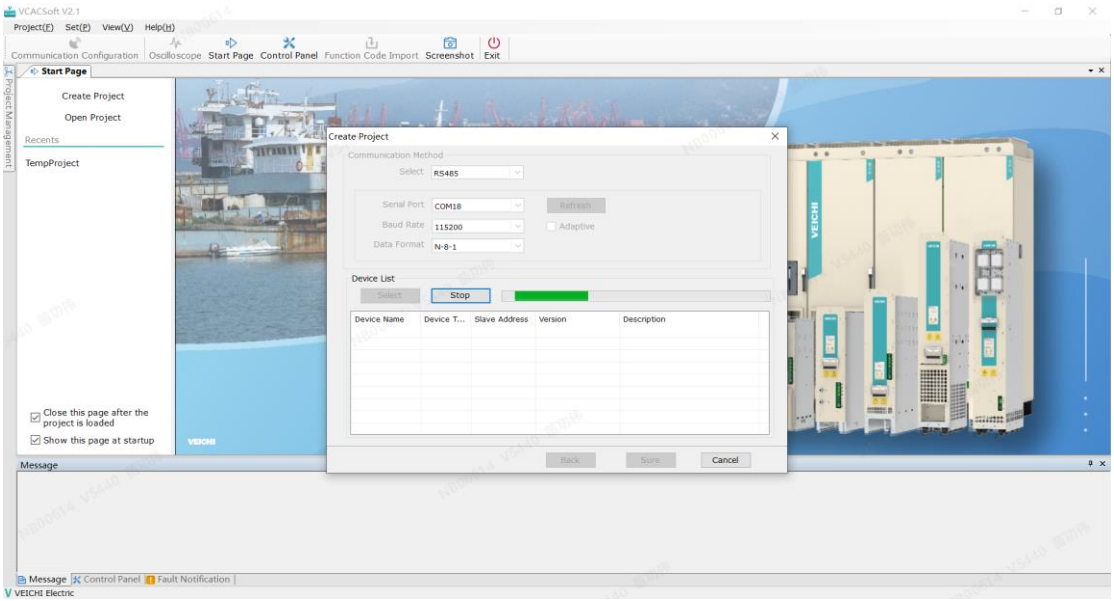


Figure 2-10 Online Search Devices

5. Check the parameter settings of the new project.

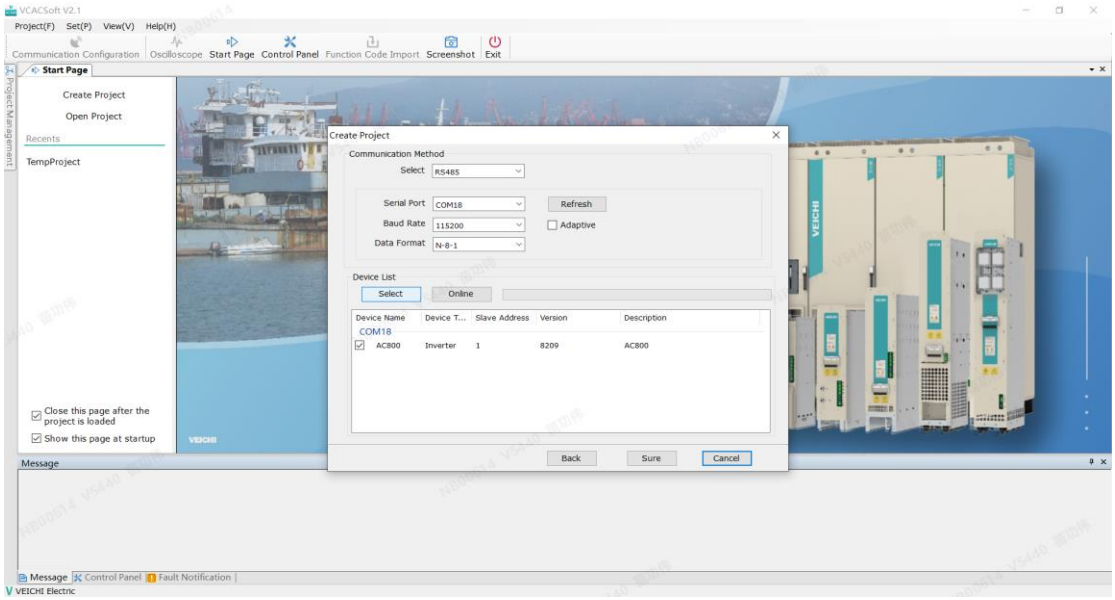


Figure 2-11 Check the New Project

6. Click "OK" to enter the following interface after the communication is connected.

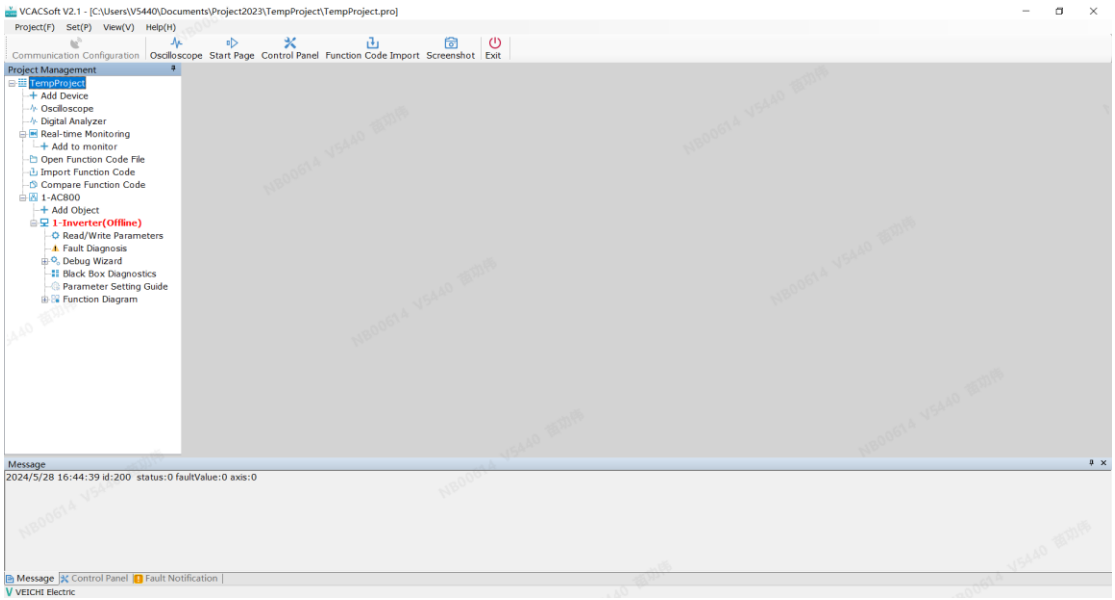


Figure 2-12 Manage the Project

2.3.2 Open Project

Steps:

1. Click "Project" in the menu bar, select "Open Project" or click "Start Page" in the toolbar, select "Open Project" on the left side of the page, select the path where the project is stored, and click "OK".
2. Project shortcut: Click "Start Page", select the list of recently used projects, and

click on a project name.

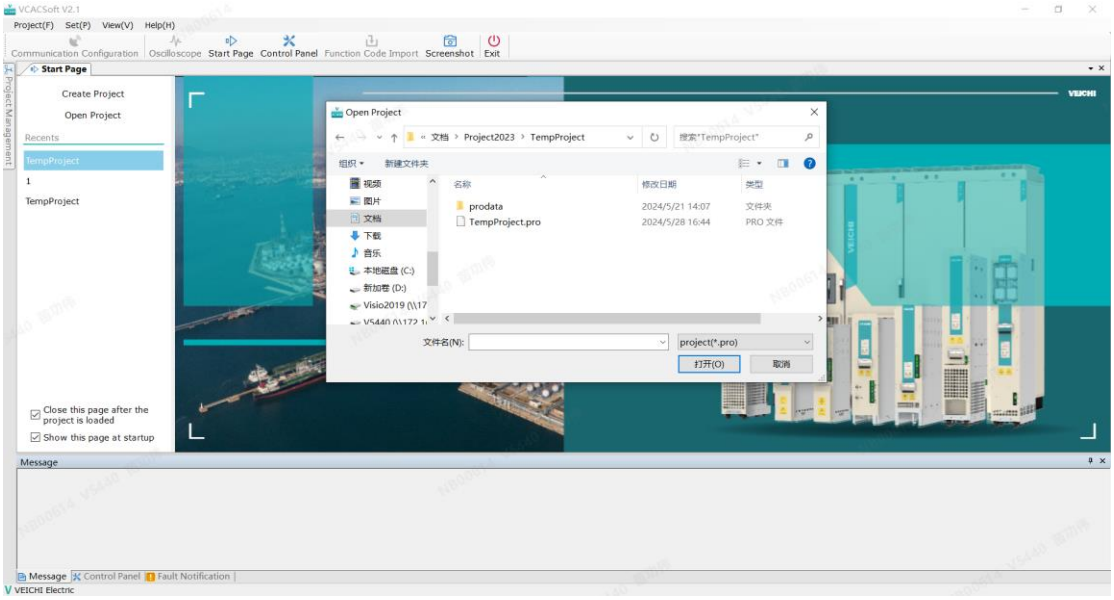


Figure 2-13 Open Project

Related operations

- **Close project**

  Click “Project” in the menu bar and select “Close”.

- **Delete project**

  Click “Project” in the menu bar and select “Delete”.

- **Save project**

  Click “Project” in the menu bar and select “Save”.

- **Save as**

  Click “Project” in the menu bar and select “Save as”.

2.4 Communication Configuration

Precondition

The project has been created and loaded.

Steps

1. Select a certain equipment name in project management, right-click and select "Communication Management" or click "Communication Management" on toolbar to enter the communication configuration page.

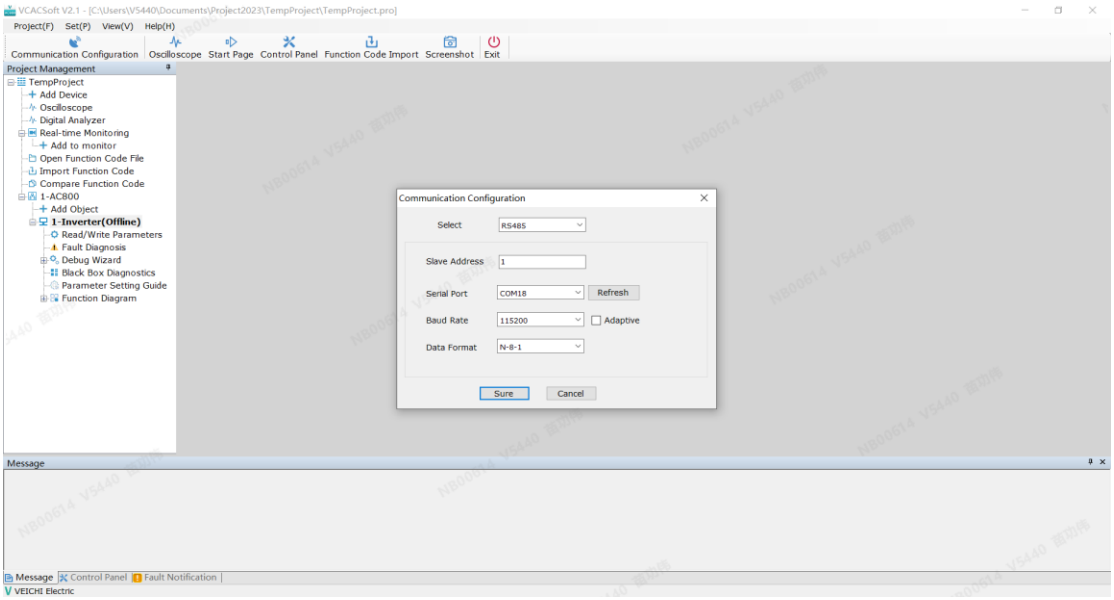


Figure 2-14 Communication Configuration

2. Proofread the communication parameters and click “OK”.

2.5 Function Code Maintenance

Function code maintenance includes operations such as read, write, compare, open, upload and download of function codes.

Status

Waiting; Communication fails
Communication canceled; Communication succeeds; Communication error (returned 0x86/0x83)

2.5.1 Read and Write Function Codes

Steps:

- **Code reading**

  Read the current group and all groups.

  1. Read the current group: Click on the right side of Read , select "Current Group" or switch "Function Code Group" on the left to read it automatically (prerequisite: "Switch function group and auto read" in "Options" on the toolbar is checked.
  2. Read all groups: Click on the right side of Read , and select “All”.

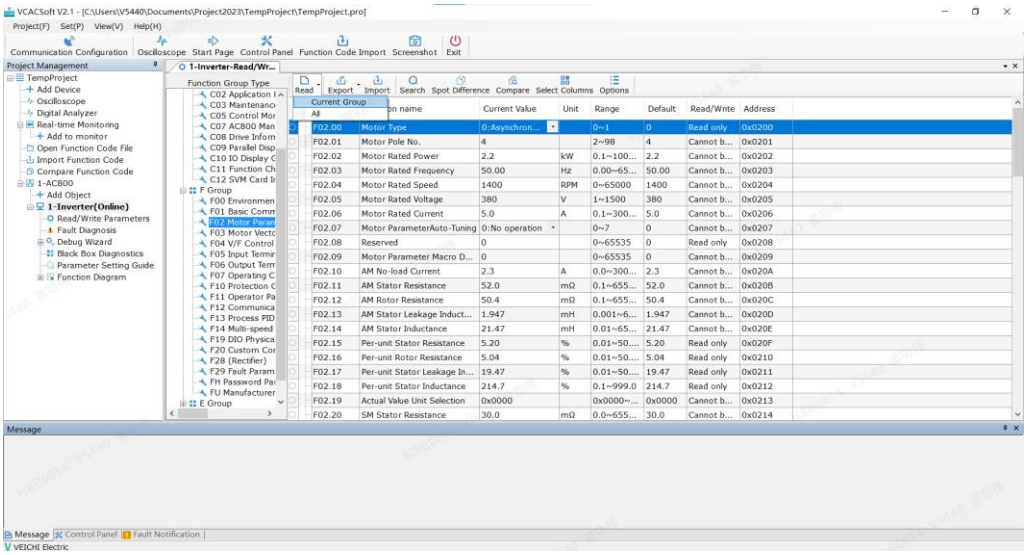


Figure 2-15 Code Reading

- **Code wiring**

  Select a function code and click the column corresponding to the current value twice to enter the editing state. After entering the value, press "Enter" or switch to other rows (Note: the premise of switching to other rows is "Menu > System Configuration > Enable Row Switching to Take Effect"), and the system will automatically send the written command.

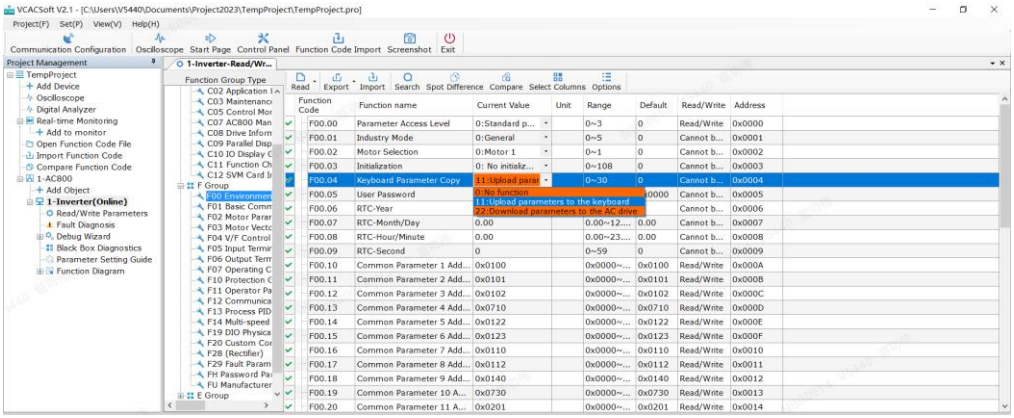


Figure 2-16 Read and Write Function Codes

2.5.2 Compare Function Codes

This function is to compare different history files and the parameters of on-line drives to identify different function codes. Comparison can be done between files and files, files and online drives, and online drives and online drives.

Steps

1. Double-click "Compare Function Code" in the project management interface or click "Compare" in the toolbar of the ”Read/Write Parameters” page.

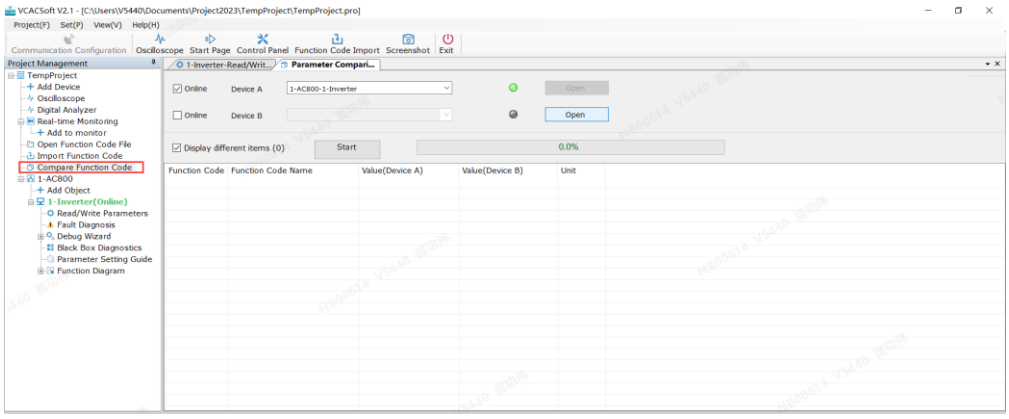


Figure 2-17 Read/Write Function Codes

2. By loading the history file or online driver, click "Start Comparison", and different items will be displayed by default. If all items need to be displayed, uncheck "Show Different Items".

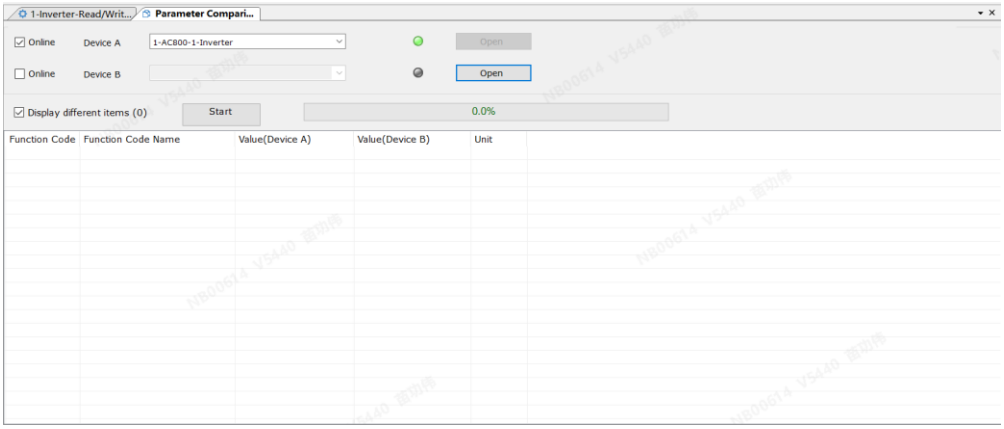


Figure 2-18 Start Comparison

2.5.3 Open Function Codes

This is used to view and analyze history files.

Steps:

1. Double-click "Open Function Code File" in the project management interface.

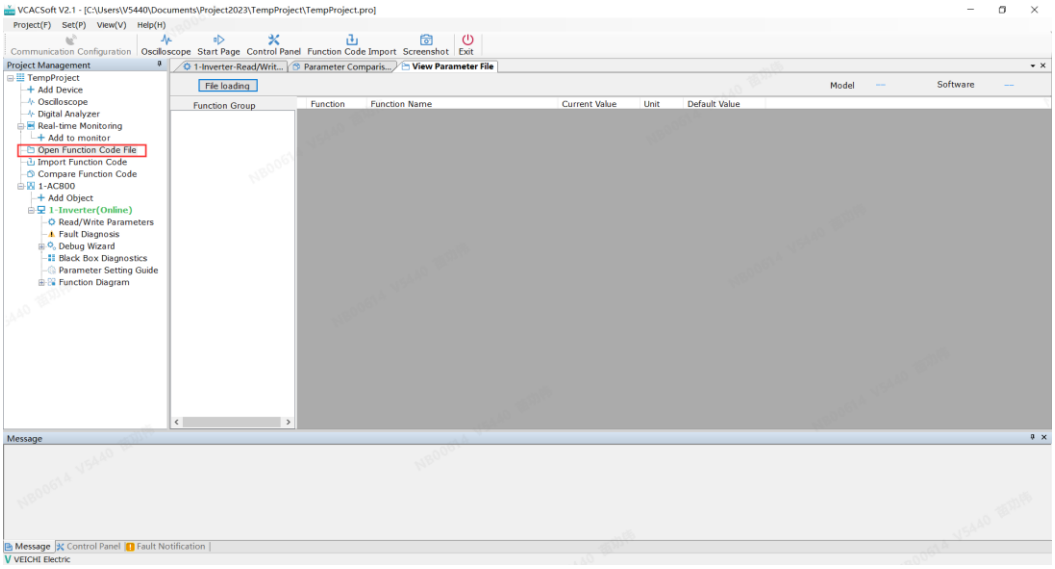


Figure 2-19 Open Function Code File

2. Click "Load File" to display information about all function groups and function codes, as well as the product model and software version of the current file.

2.5.4 Bulk Export/Import

Export the current group and all data for backup, or import the backup data to another drive.

Steps

- **Bulk export**
  1. Enter the “Read/Write Parameters” page and click “Export ” on the right side and then select “Current Group” or “All”.
  2. Select the storage path, click “OK“, and the system will automatically read the data, and finally export them.

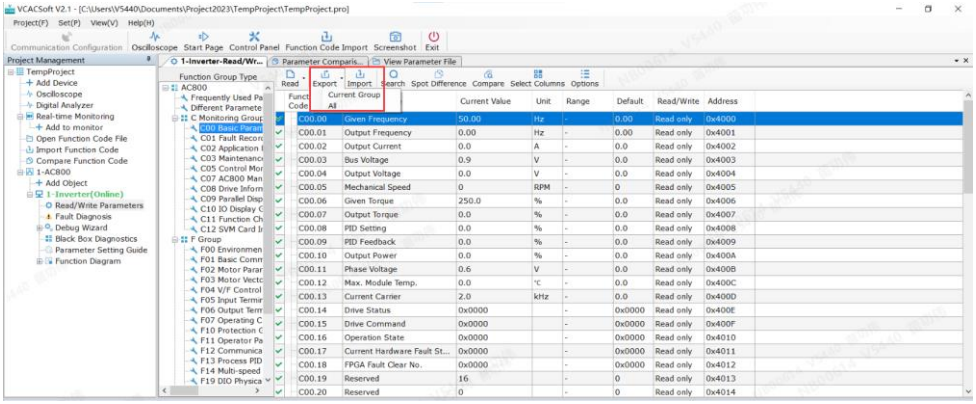


Figure 2-20 Bulk Export/Import

- **Bulk import**

1. Enter the "Read/Write Parameters" page, click "Import" on the toolbar or double-click "Function Code Import" in the “Project Management” interface.

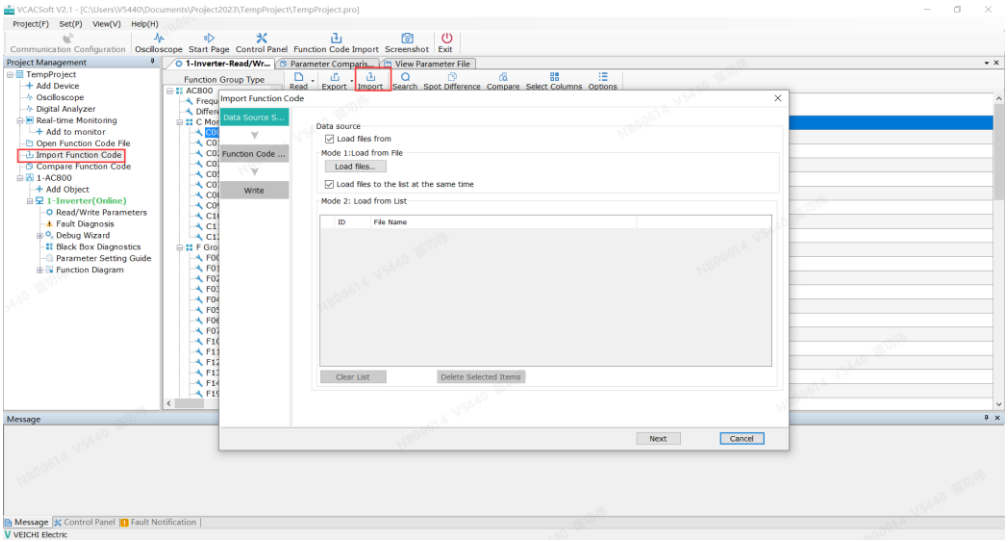


Figure 2-21 Bulk Export/Import

2. Click “Load File” or select a loaded file from the list (prerequisite: uncheck “Load from File”) and click “Next”.

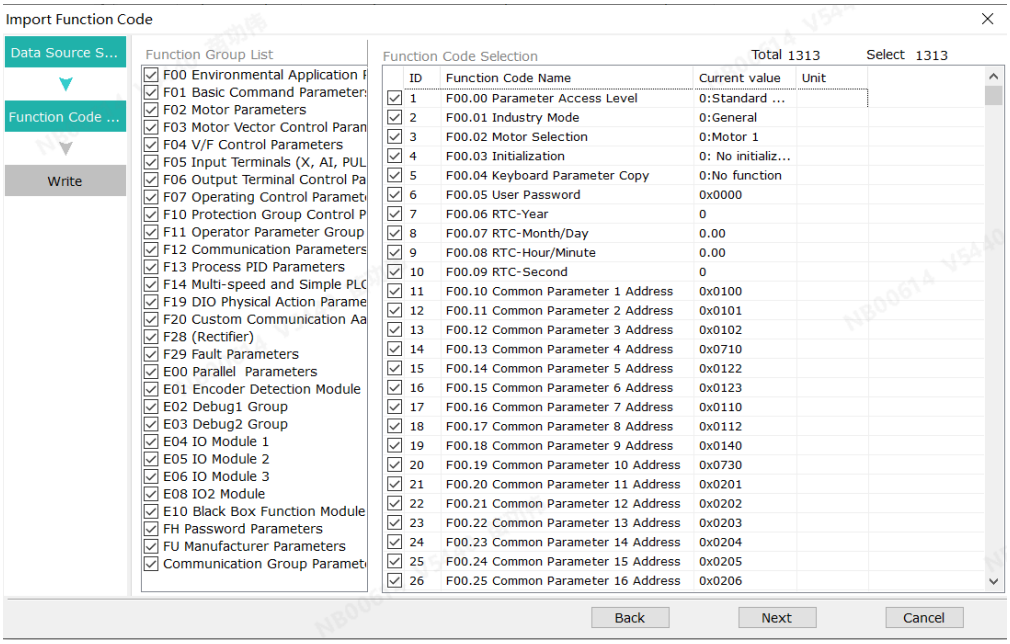


Figure 2-22 Load Files

3. All are selected by default. Users can exclude the some function codes for importing. Click ”Next”.

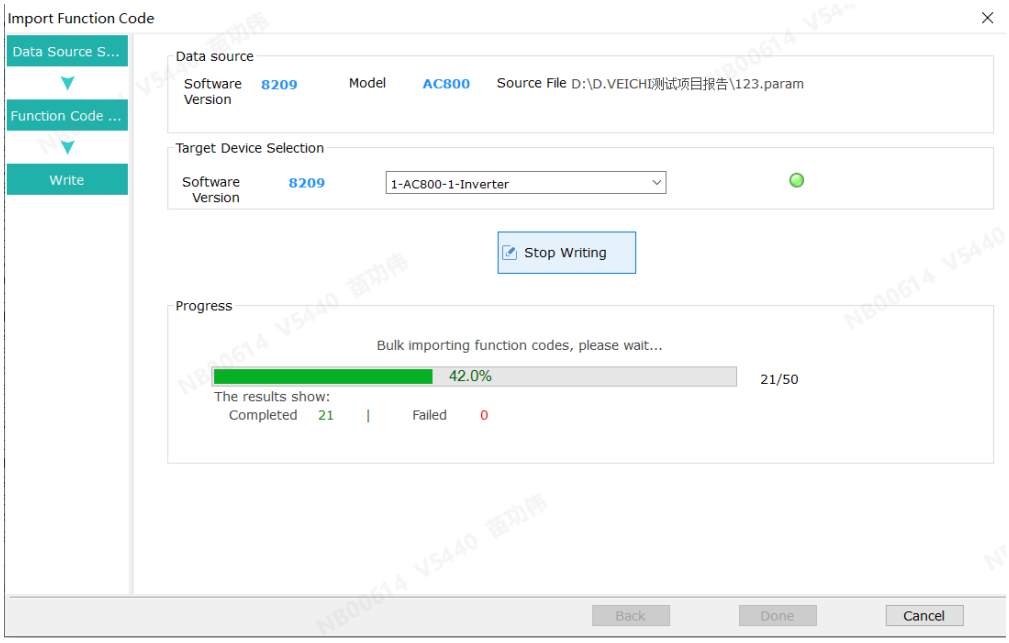


Figure 2-23 Bulk Export/Import

4. Confirm the target driver and version to import, and click ”Start Writing”. The execution result will be prompted in real time, and click "Finish" after the execution progress is 100.0%.

2.5.5 Auxiliary Functions

Down below are special functions for reading and writing parameters, which need to be operated on the "Read/Write Parameters" page.

- **Search**

  Click "Search". Fuzzy search is supported. Please enter keywords, and click "Search".

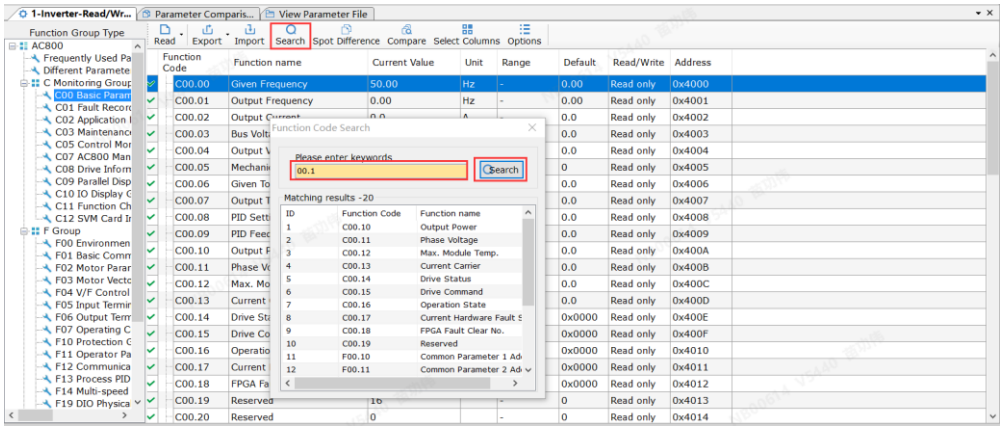


Figure 2-24 Read/Write Function Codes

- **D-Finder**

  Click "D-Finder" on the toolbar, and the system will automatically read all the parameters. When it is finished, all the different parameters (compare the current value with the default value) will be displayed.

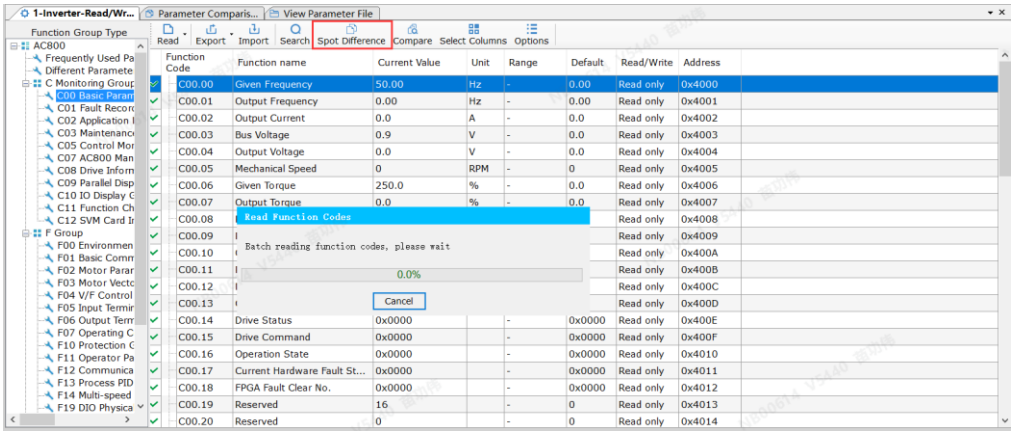


Figure 2-25 D-Finder

The result will be automatically displayed in the pages of different parametes.

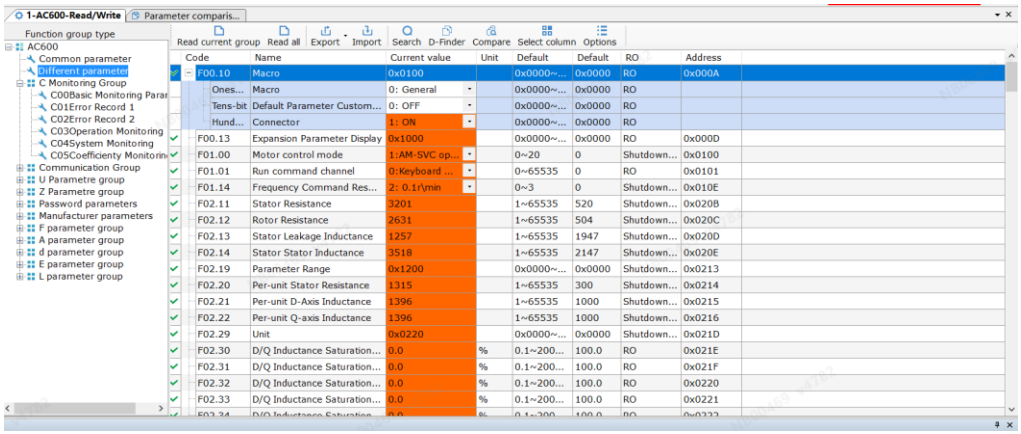


Figure 2-26 Different Parameters

- **Column display**

  Click "Select Columns" on the toolbar, and choose to hide or show columns in the pop-up box.

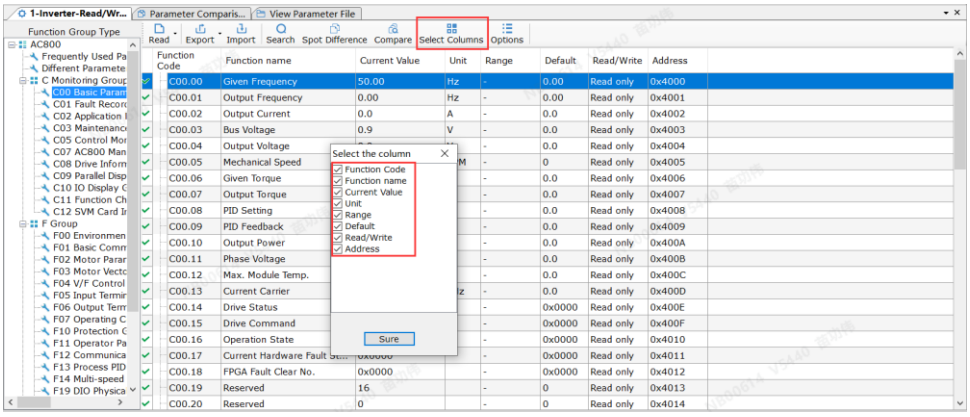


Figure 2-27 Display in Different Parameters

- **Configuration options**

  Click "Options" on the toolbar, and select the corresponding function in the pop-up box, such as whether to display reserved parameters, whether to display function code comments, whether to write EEPROM, etc.

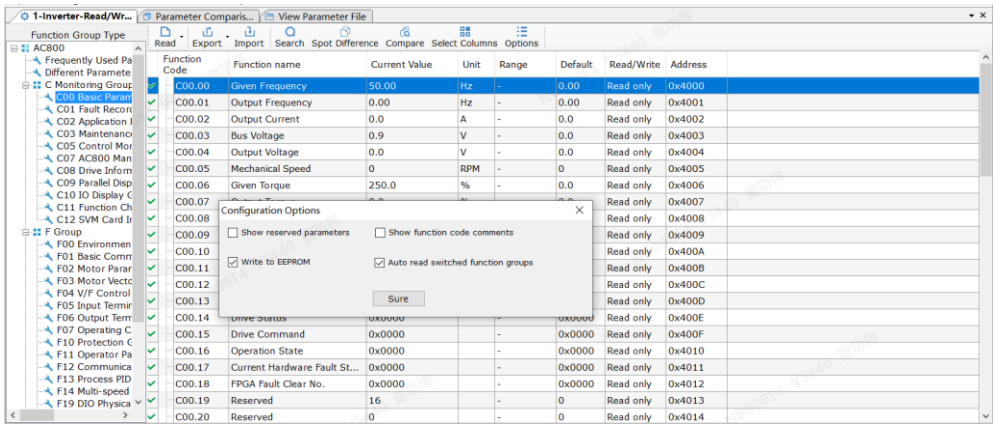


Figure 2-28 Column Display

2.6 Real-time Monitoring

View the data changes and status of parameters in real time.

Steps:

1. Add a monitoring interface

   Double-click "Add to monitor" in the “Project Management” interface to automatically generate a node, such as "Monitoring 1", and right-click on "Rename" Multiple monitoring pages are supported). Double-click "Monitoring 1" to enter the real-time monitoring page.

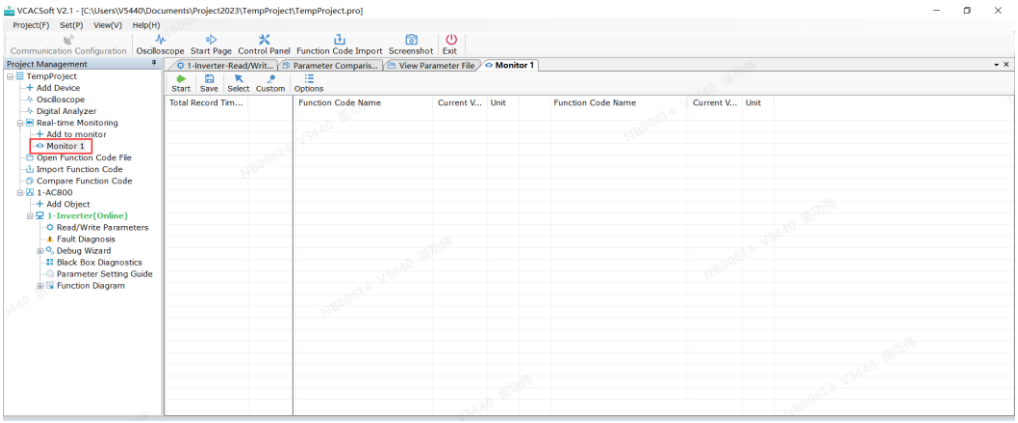


Figure 2-29 Configuration Options

2. Select monitoring parameters

Click "Select", and then select the device in the pop-up box. The parameters are monitored in real time by default.(Any parameters can be selected by switching), and select the needed parameters.

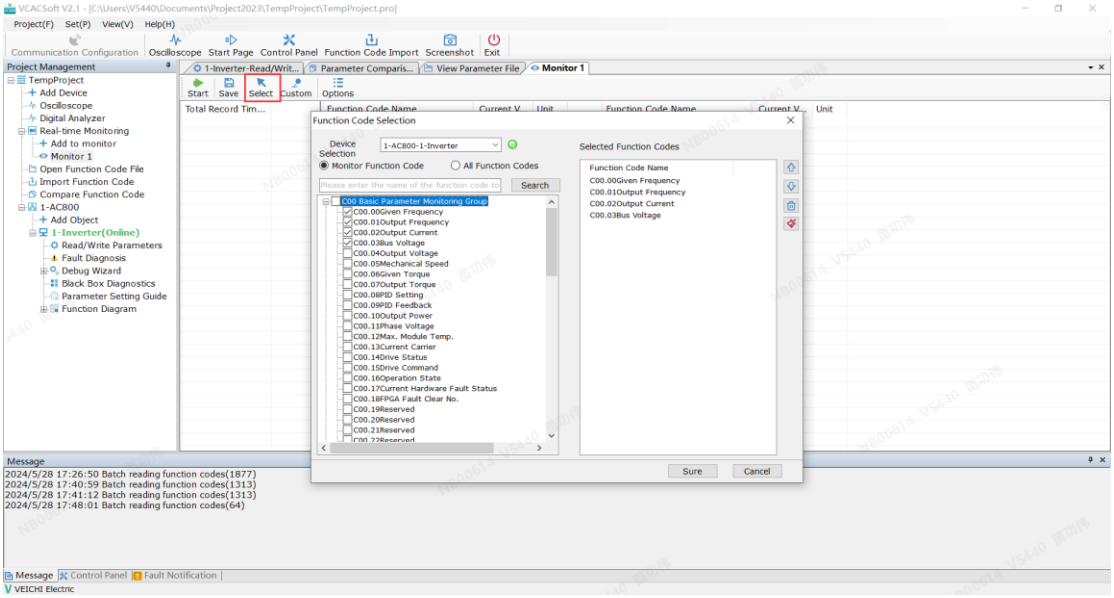


Figure 2-30 Add Monitoring Items

3. Monitor multiple devices

If multiple devices are to be displayed in one interface at the same time, they will be separated by groups.

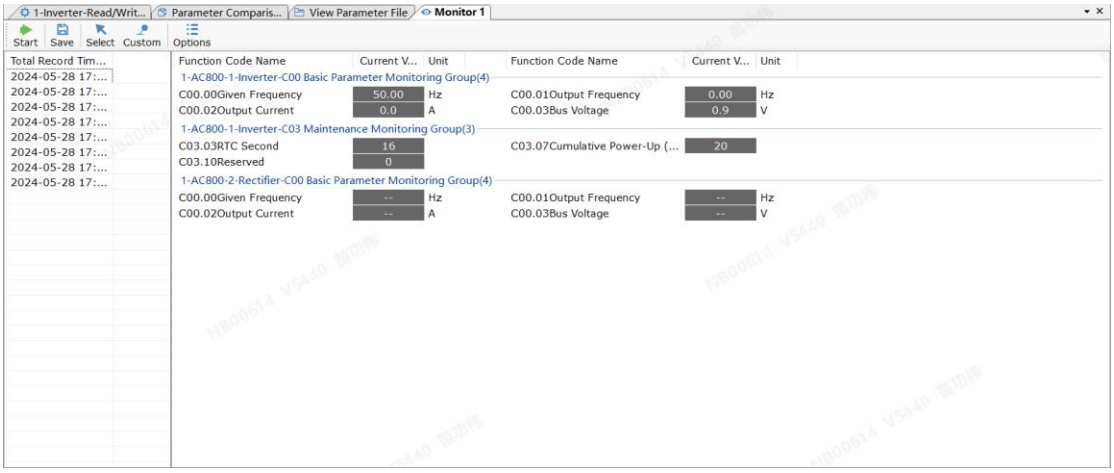


Figure 2-31 Select Monitoring Parameters

4. Custom to add device parameters

If the monitored parameters are not in the current device parameters, please customize and add them. Click Custom to add numeric type or switching type.

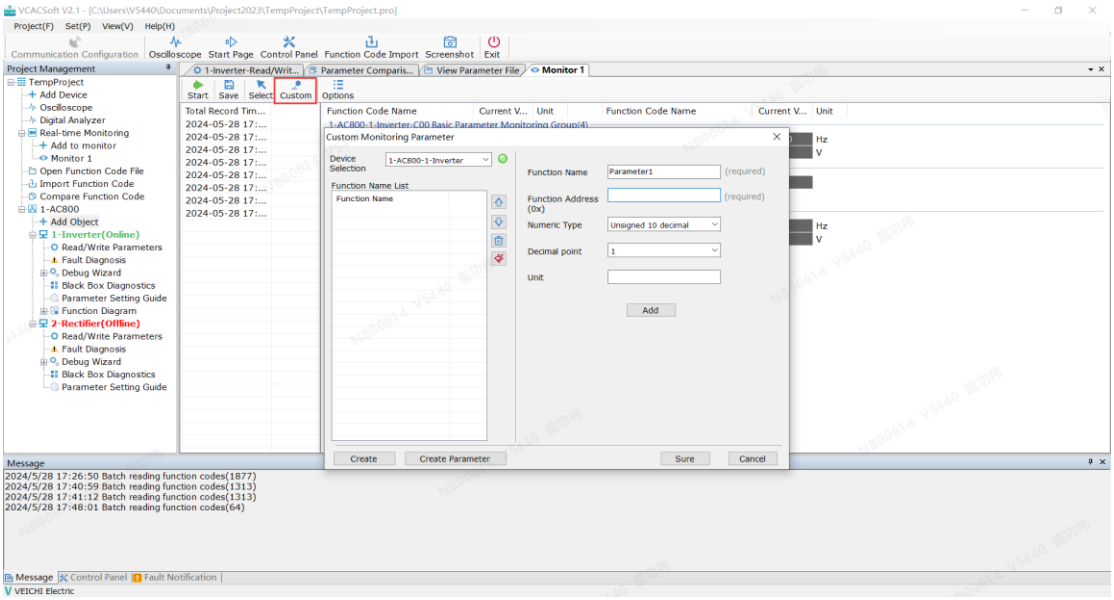


Figure 2-32 Multi-device Monitoring

5. Refresh data

   Click “Start”, and the data will be refreshed automatically.

6. Save data

   Click "Save" and “OK” in the pop-up box.

7. Configuration options

   Click “Options” to set the number of record lines, whether to save automatically and how to display them.

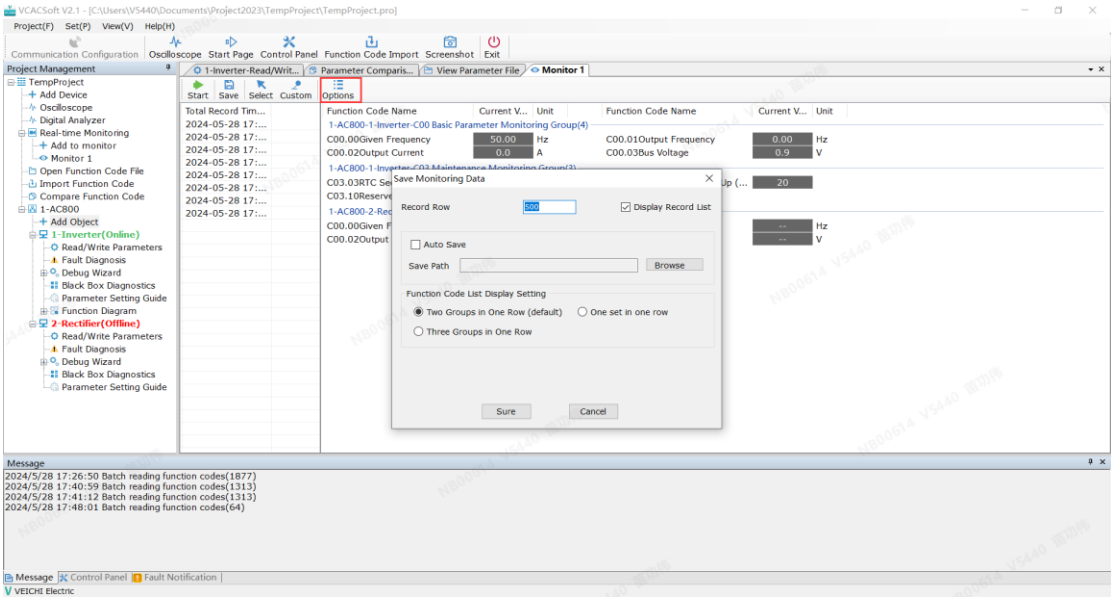


Figure 2-33 Customize the Device Parameters

2.7 Virtual Oscilloscope

Virtual oscilloscope collects data at high speed and displays it in graphic curves for analysis.

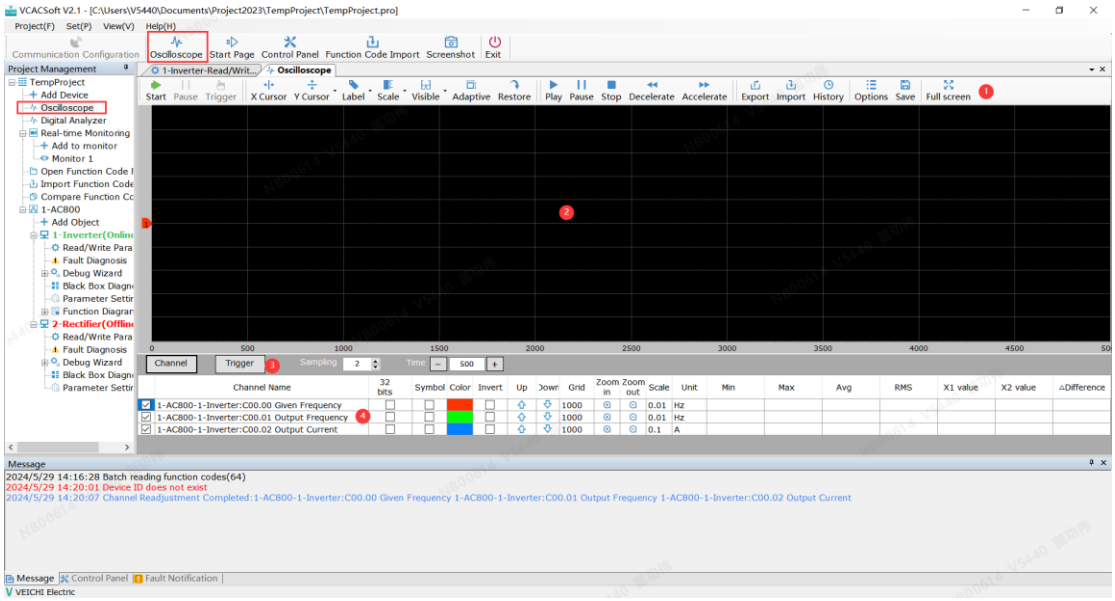


Figure 2-34 Configuration Options

①-Toolbar

Toolbar includes Start, Pause, Manual trigger, X-axis cursor, Y-axis cursor, XY label, Y-axis scale, Y-axis curve visible, One-click reset, Playback (Start, Pause, Stop, Decelerate, Accelerate), Export, Import, History, Options, Save, Full screen and other functions.

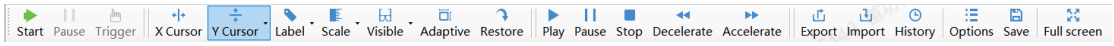


Figure 2-35 Oscilloscope

②-Curve display area

To visualize different curves.

③-Channel and trigger parameter setting

To set channel and trigger condition of related parameters

④-Channel parameter list

To provide a list of channels and display of related operations and measured values.

2.7.1 Real Time Oscilloscope

Steps:

1. Configure channels

Click "Channel" to enter the channel interface, up to 8 channels to be configured.

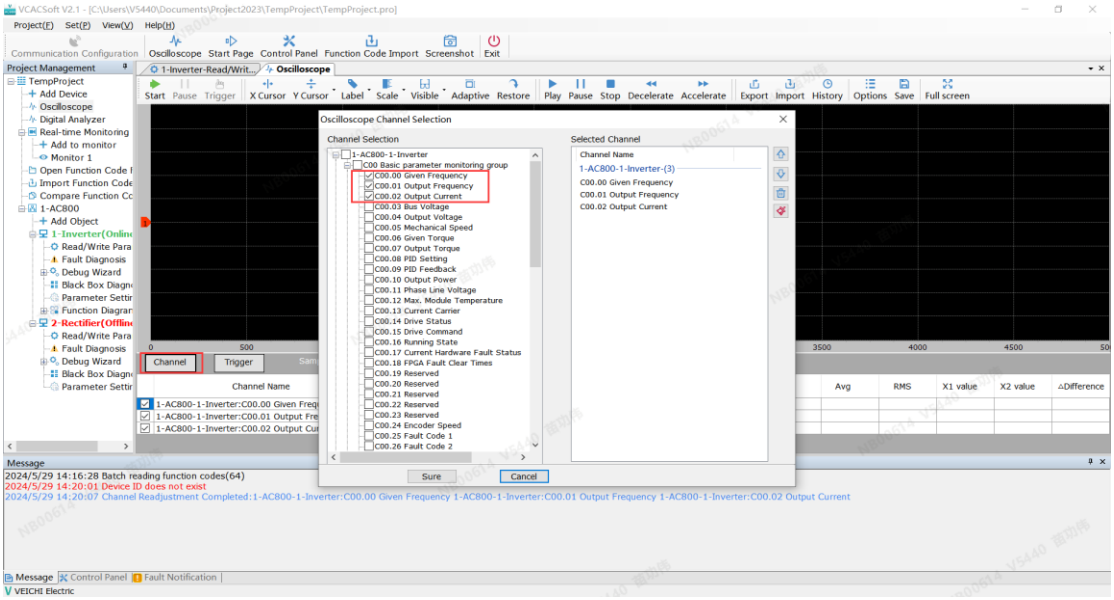


Figure 2-36 Toolbar

2. Triggering

If you need to draw the waveform by triggering, select "Trigger" to set the conditions.

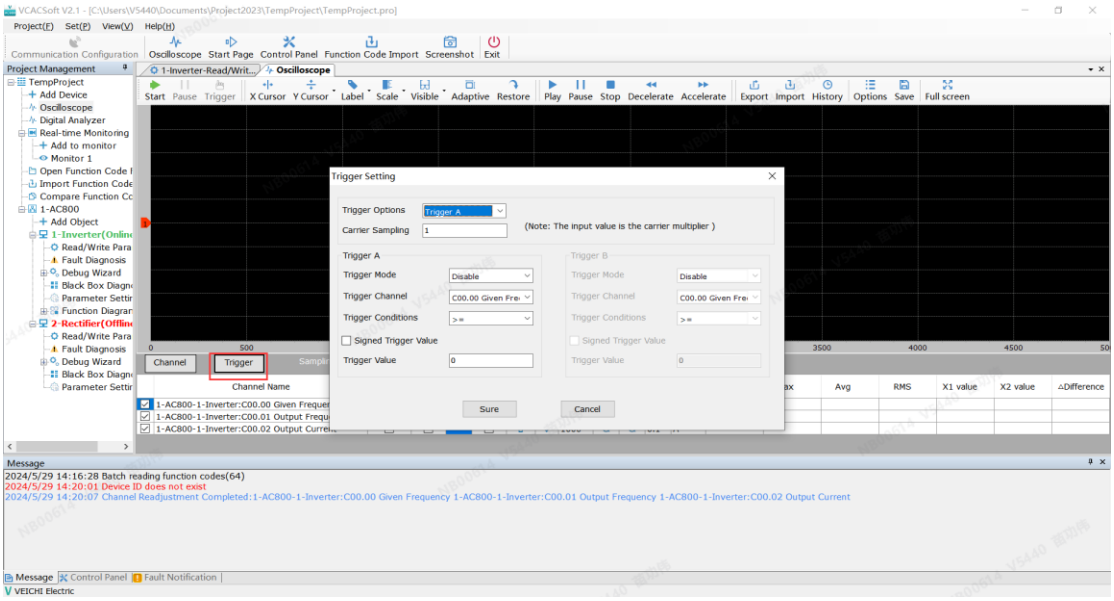


Figure 2-37 Channel Configuration

3. Continuous and trigger oscilloscope

- Start

  Click  to start recording, and the icon status changes to . “Pause” and “Manual Trigger” icons are changed to the available status.

- Stop

  Click  to stop recording, and the icon status is changed to . And “Pause” and “Manual Trigger” icons are changed to the unavailable state.

- Pause

  Click  to pause recording, and the icon status is changed to .

- Continue

  Click  to continue recording, and at the same time, the icon status is changed to .

4. Manual trigger recording

Input condition: Start recording (that is, the status of the start button changes to )

Click , and the system immediately issues a manual trigger command, and the waveform will stay in the last state after receiving the triggered waveform.

Note: If you need to trigger it again, please start recording once more.

5. Graphics

- X-axis cursor

  Click , and the graph automatically displays X1 and X2 axes, and on the right side X1 and X2 values corresponding to X-axis cursor, and the points/theoretical time difference/actual time difference between the two axes will be automatically displayed.

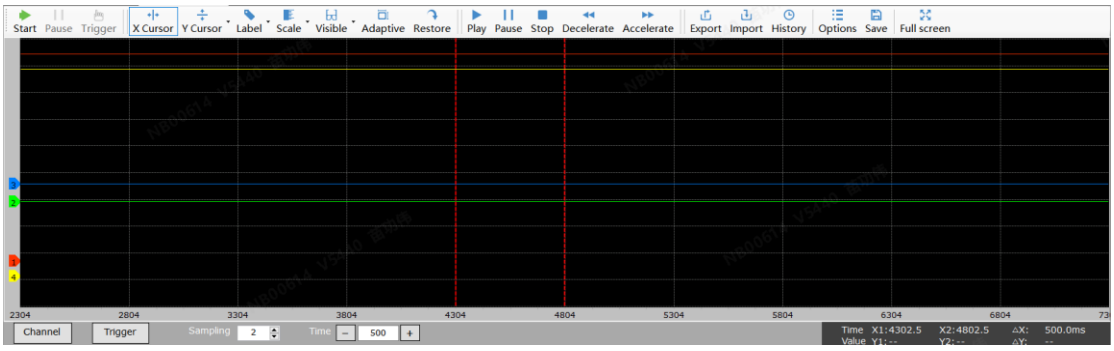


Figure 2-38 Triggering Settings

Note:

➢ X1 and X2 are two cursors on the X axis correspond to the time and the

values of channels 1 ~ N; △ means the difference between two cursors.

- Theoretical time difference: the point No. between X1 and X2 * sampling interval; That is, the value of △. (Theoretical time difference shall prevail in measurement)
- Actual time difference: X1 and X2 are the recording time of data received by the upper computer, that is, the system time provided by the computer, which is only used as a reference in measurement.
- Under the condition of stable communication, the theoretical time difference is basically equal to the actual time difference, and if there is packet loss, the theoretical time difference will be lower than the actual time difference.
- Fine-tuning X-axis cursor: Click a cursor axis, and then press the left and right keys of the keyboard to adjust it slightly.

- Y-axis cursor

The Y axis contains multiple coordinate axes, which can be selected according to the channel, and the color of the cursor varies with the color of the curve. Click , if the channel name is selected, the graph will automatically display the curves of its Y1 and Y2 axis cursor in the same color as the channel.

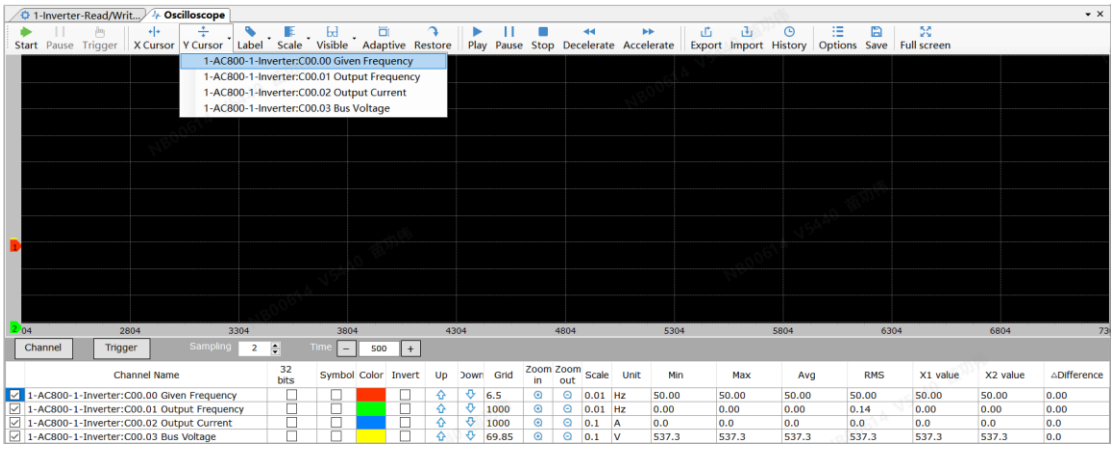


Figure 2-39 X-axis Cursor Display

Note:

- The values corresponding to the two cursors of Y□ and Y◇ of the current channel can be displayed and △ means the difference between the two cursors.

- Label (X/Y)

Y axis contains multiple coordinate axes, which can be selected according to

channels, only one channel at a time. Small dots represent a point at a certain time, and the XY value of the current point will be displayed in the labels when the mouse is placed at it.

Click , if "1-AC800-1-Inverter: C00.00 given frequency" is selected, the graph will automatically display dots corresponding to curve 1.

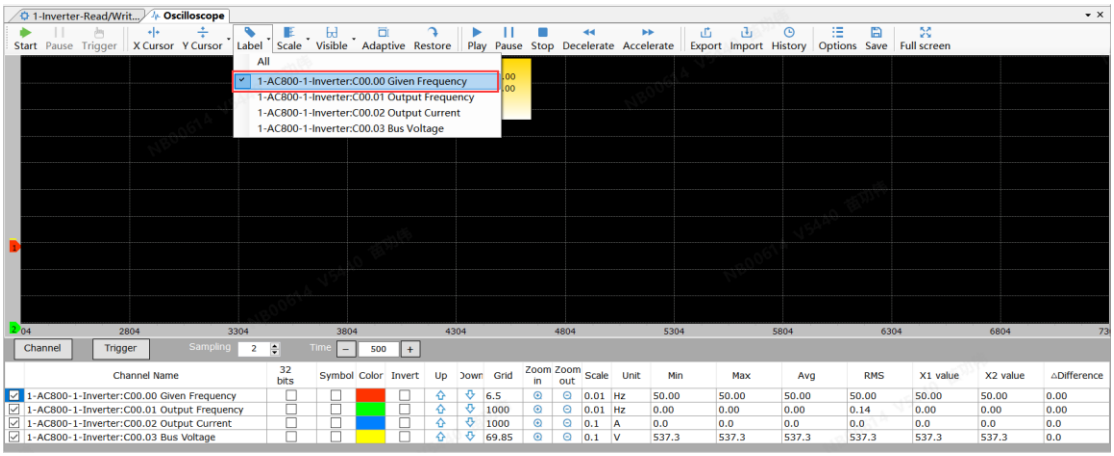


Figure 2-40 Y-axis Cursor Display

To display labels for all channels, click “Label” and select “All”.

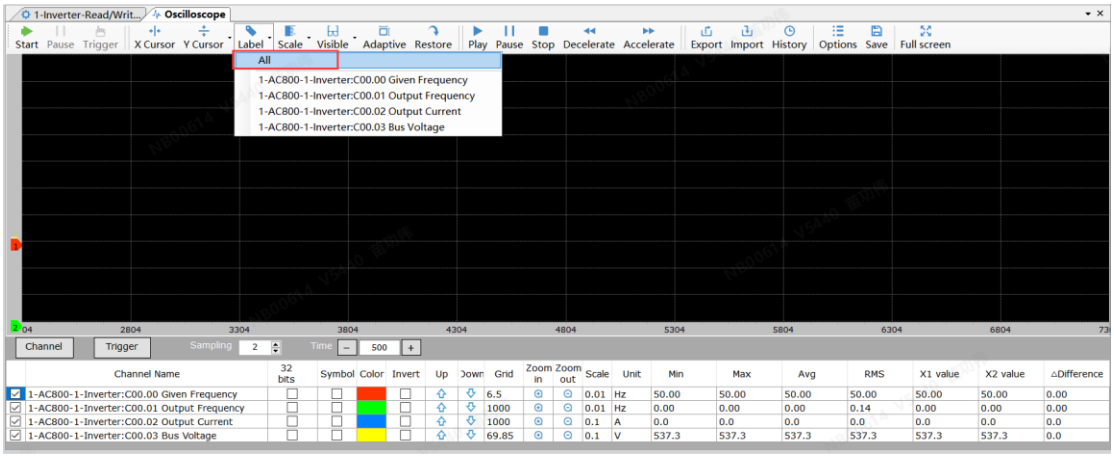


Figure 2-41 Select Labels

- Scale

The Y axis contains multiple coordinate scales, which can be selected according to channels, only one channel at a time. And the Y-axis scale is displayed in the left area.

Click , if "1-AC800-1-Inverter: C00.00 Given Frequency" is selected, the Y-axis scale corresponding to curve 1 is shown on the left.

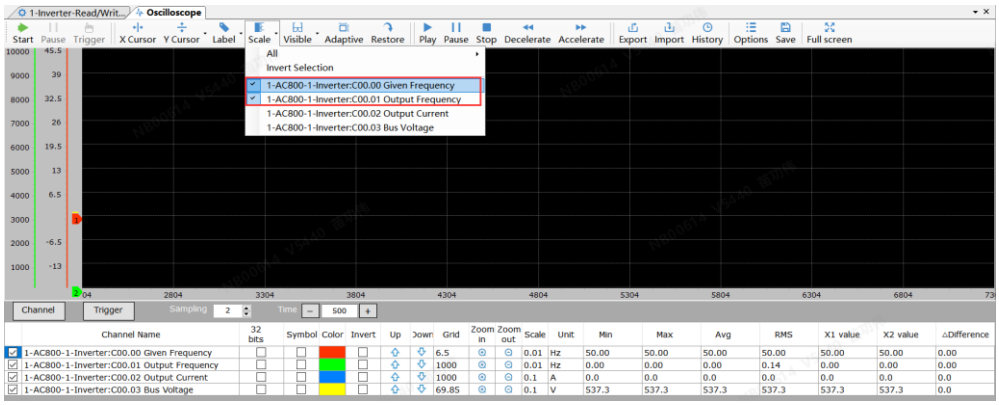


Figure 2-42 Show Scale

- Show/Hide curve

  Y-axis contains multiple curves, which can be selected according to channels. Only one channel can be selected at a time, and all Y-axis curves are displayed by default.

  Click , if "1-AC800-1-Inverter: C00.00 given frequency" is unchecked, the Y-axis curve corresponding to curve 1 will be automatically hidden in the graph.

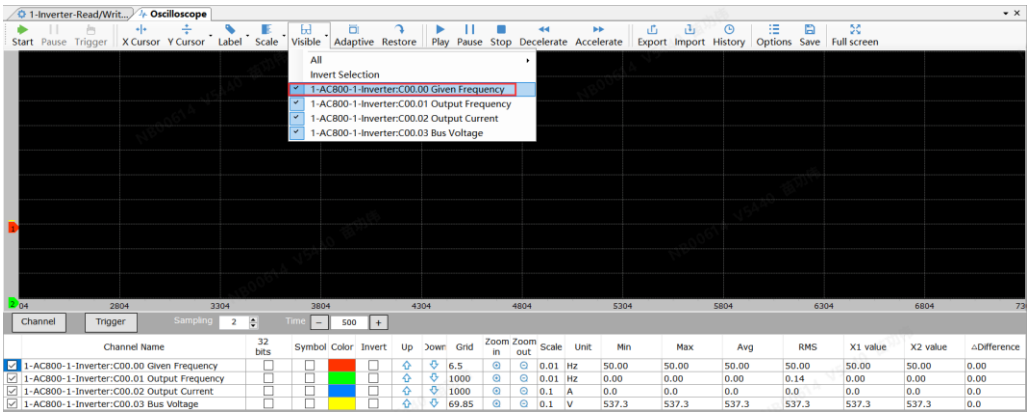


Figure 2-43 Show Scale

- One-click reset

  Click it to reset the curve, or to restore the original shape when it is magnified or moved.

  Click .

- Zoom in/out
  - Hold on the left button and at the same time draw an area from the upper left corner to the lower right corner to zoom in. Hold on the left button and at the same time draw an area from the lower right corner to the upper right corner to zoom out.
  - Curve X/Y zoom in: Click in the list.
  - Curve X/Y zoom out: Click in the list.

- Curve self-adaptation

  Click  to adjust the curve size with one key and display it in the visual area,to realize quick adjustment.

- Curve translation
  - Horizontal translation of the curve: Hold on the right button and move left and right (Note: 0 point position on the right is the end).
  - Vertical translation of single curve: press . If you need to move continuously, please hold on .
  - Move all curves vertically at the same time: Click "Options > Graphic Options", check "Right mouse button move up and down", and then it will work.
  - Click flag and drag it up and down to translate the corresponding curve.

6. Curve playback

   Curve playback provides playback of existing history curves; Playback includes Start, Pause, Stop, Accelerate and Decelerate.

   - Start playback

     Click , and Pause and Stop icons are available, while Start playback icon turns to gray, and playback starts.

   - Pause playback

     Click , and Pause icon turns to gray, while Start is available, and Pause playback works.

   - Stop playback

     Click , and Pause and Stop icons turn to gray, while Start playback icon is available again, and playback is stopped.

   - Decelerate playback

     Click  to perform deceleration and drawing will be slowed down.

   - Accelerated playback

     Click  to perform acceleration and drawing will be quickened.

7. Data import/export.

   Data and pictures can be exported at the same time according to the current graphics in TXT, XML, EXCEL, HTML. And view the exported data via import function.

   - Data import

     Click  in the pop-up box to load the existing data files.

- Data export

  Click  in the pop-up box to save files to the specified path. When the file does not exist, the system will automatically generate a folder with five files with different extensions but the same name.**Do not change the names of folders and files**, as shown in the following figure:

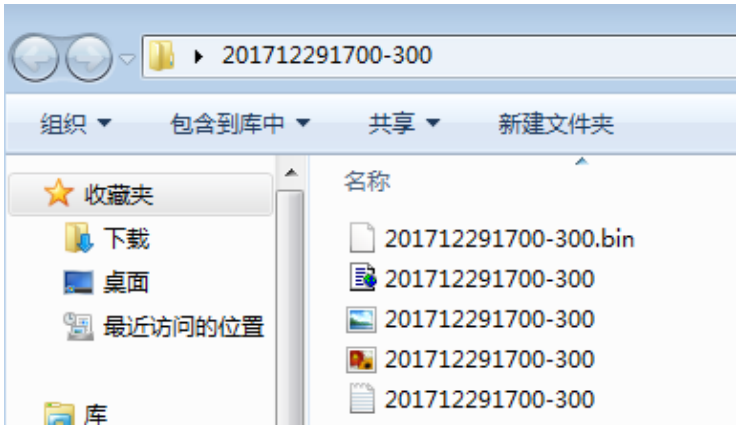


Figure 2-44 Hide Curves

8. History

   Record the current imported history curves, which can be further added or deleted, to quickly find the needed history curves.

9. Configuration options

- Graphic options

  Click  to select Graphics Options, and enter Graphics Options page.

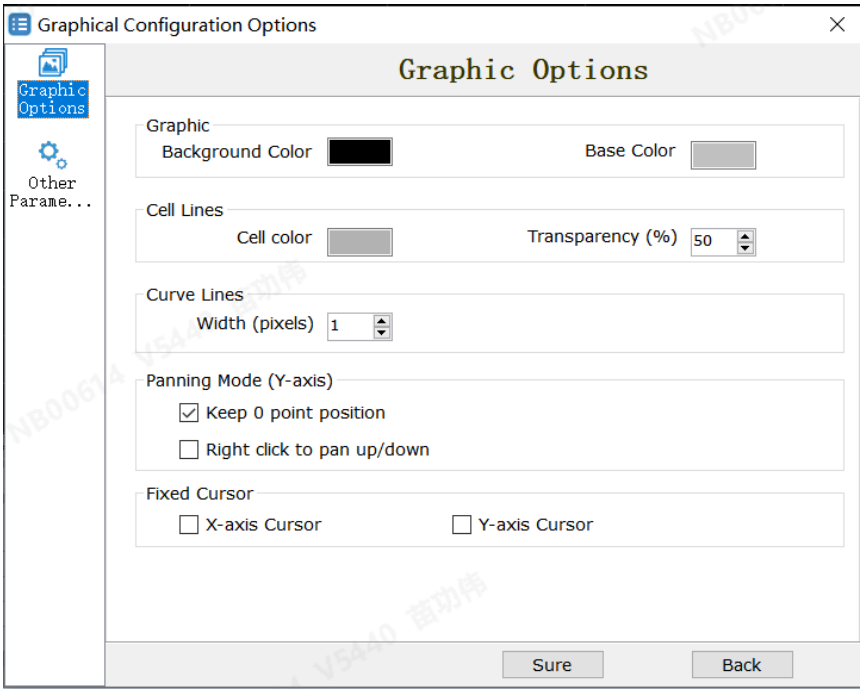


Figure 2-45 Data Export

Note:

- Background color: Set the background color of graphics.
- Panel color: Set the panel color of graphics.
- Line width: Set the line width of a curve in pixels.
- Grid line: Set color and transparency.
- 0 point position holding: If it is checked, When press to translate the Y-axis curve up and down, the 0 point will remain in the visual area of the graph, and it will not be able to translate any more until the top and bottom; On the contrary, the 0-point position will be translate up and down with no limit; This function is checked by default.
- Right mouse button for up and down translation: When it is checked, use the right mouse button for up and down translation of all curves; On the contrary, this function will not work; It is not checked by default.

- Other parameters

  Click and "Other Parameters" to switch to enter the setting page of data saving and cache size.

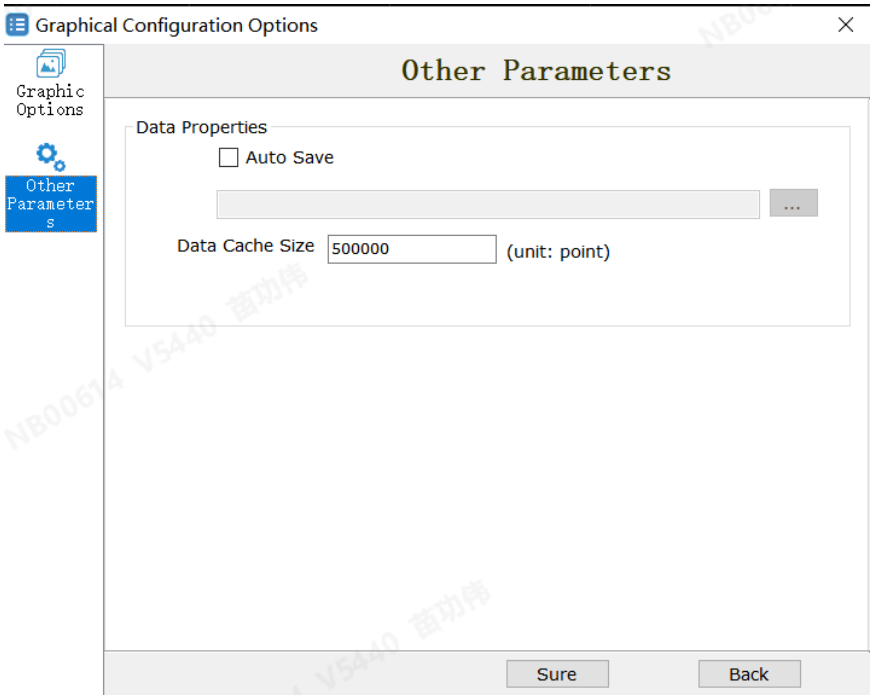


Figure 2-46 Others Parameter Settings

10. Channel attribute

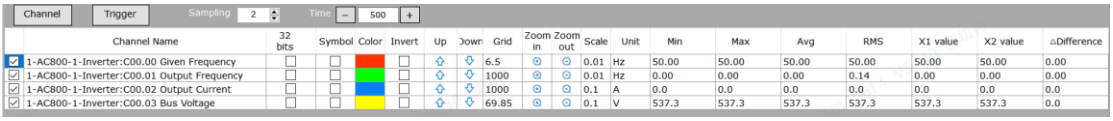


Figure 2-47 Channel Attribute

- Sampling period: When RS485 communication works, it will change according to baud rate.
- Timeline: The range is "1 ~ 10000", click + to increase the X-axis grid size while shorten the curve, click − to reduce the X-axis grid size while prolong the curve.
- 32-bit: When selected, this value has 32 bits of data.
- Signed: If this function is selected, the data will be within "-32768 ~ 32767", otherwise it will be in the interval of unsigned number "0 ~ 65535".
- Inverse: When the inverse option is checked, the data will be reversed and the curve will be automatically displayed in reverse.
- Channel: Double-click the corresponding cell in the channel name column to pop up the channel for re-selection.
- Color: Select color for curves.
- Grid: The space between Y-axis coordinates and each grid can be increased or decreased accordingly, with a range of "1 ~ 100,000". Click *Zoom-in* to increase the Y-grid size while shorten the curve, and click *Zoom out* to reduce the Y-grid size while prolong the curve.
- Scale: The size of the curve changes according to scaled data.
- Maximum value: The maximum value of the current channel curve in the visible area.
- Minimum value: The minimum value of the current channel curve in the visible area.
- Average value: The average value of the current channel curve in the visible area.
- Valid value: The valid value of the current channel curve in the visual area.
- X1: Y value to X1 axis.
- X2: Y value to X2 axis.
- △ Value:X2-X1

2.7.2 Digital Analyzer

Digital analyzer is an expansion function of the real-time oscilloscope, which is mainly used for data analysis and decision-making of black through loading history curve data and black box diagnosis.

For specific operations, please refer to "2.7.1 Real Time Oscilloscope".

2.8 Event Analysis (Black Box Diagnosis)

When a fault occurs on the AC drive, data 1.5 seconds before and 0.5 seconds after will be collected, including 16 pieces of ADC interrupt data (11 of internal data, 5 of customized data) and 64 pieces of 2ms cycle data (48 of internal data, 16 of customized data). The collected data will be automatically saved to the SD card of the VCU, which can store up to 1000 sets of fault data sent recently.

Steps:

1. Select "Read/Write parameters> E Parameter group > E10 Black Box" in "Project Management" to view the current status of the black box function.

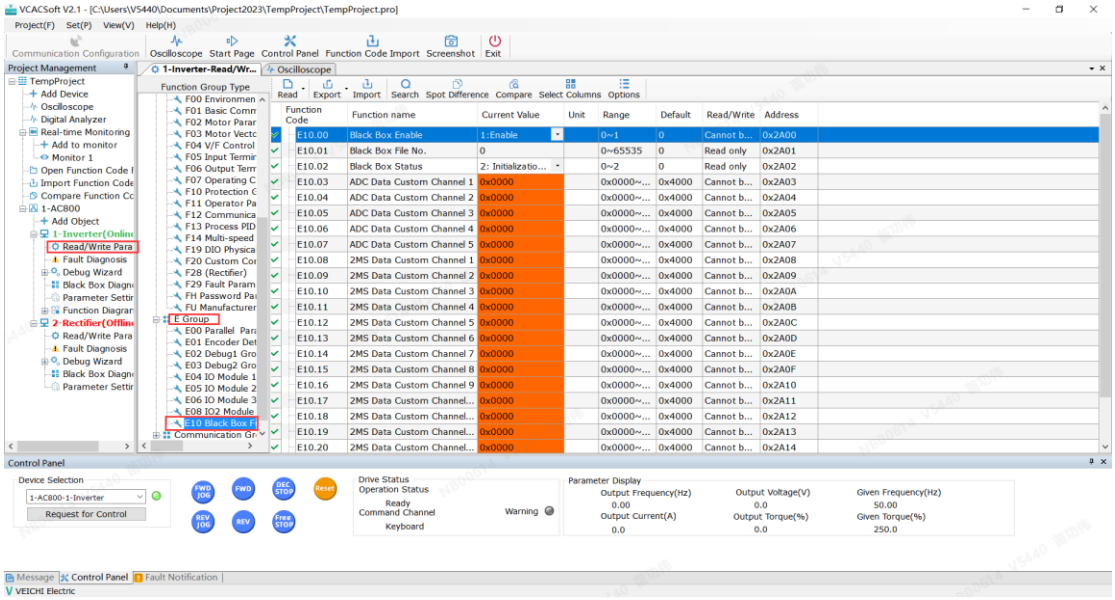


Figure 2-48 Check the Status of The Black Box

Parameter description:

- E10.00_black box enabling: (0: not enabled; 1: enabled)
- E10.02_ black box status: (0: initialization not completed; 1: initializing; 2: initialization completed)
- E10.03~07_ADC data customization channel: users can customize the parameter channels monitored of black box, the parameter value is the communication address of the monitoring parameter group, e.g. 0x4000 corresponds to monitoring parameter C00.00[Given frequency].
- E10.08~23_2MS data customization channel: the parameter value is the same as ADC interrupt data. The "Black box enable" can be set to "Enable" only when the "Black box status" is under "Initialization is completed".

2. Select “Rectifier> Black Box Diagnosis” in “Project Management”, enter the Black Box interface, "Get list" to view the faults and time saved in the SD card.

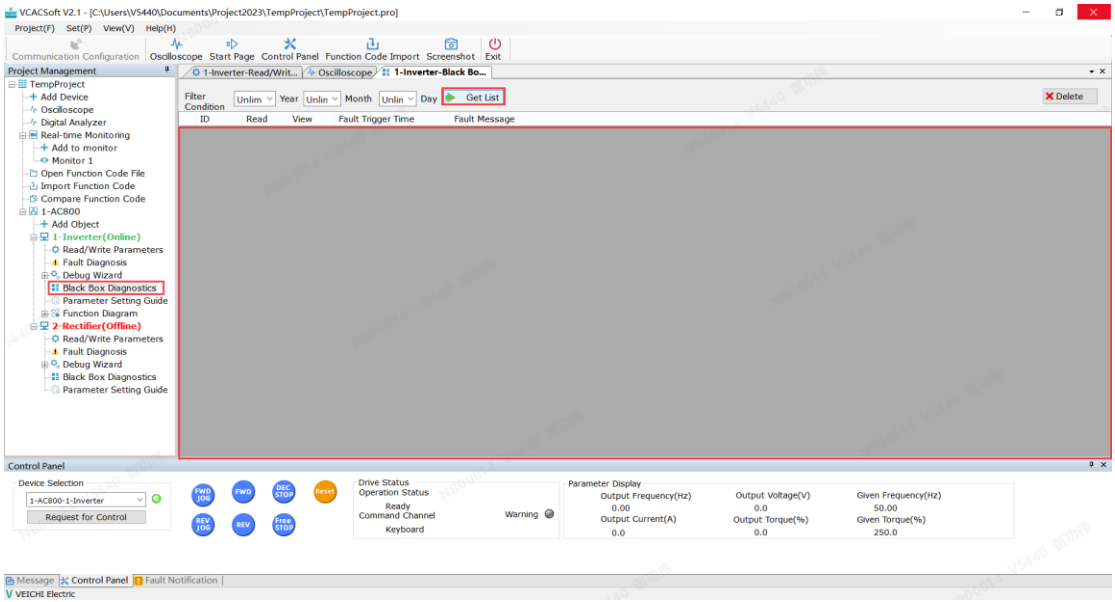


Figure 2-49 Black Box

3. Select one of the faults, click "Read", and VCACSoft will automatically read the fault entries. Please do not disconnect the AC drive from the host computer at this time.

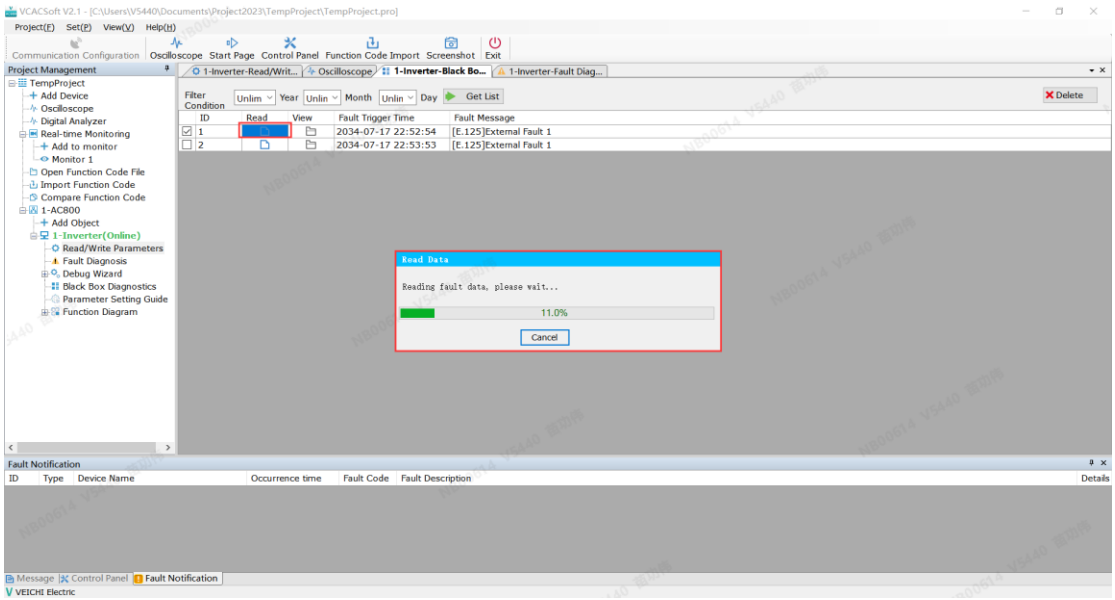


Figure 2-50 Read The Fault Entry

4. After reading the fault records, VCACSoft automatically displays the "Channel Selection" interface, please select the timed data channel or ADC interrupt data channel and click "OK".

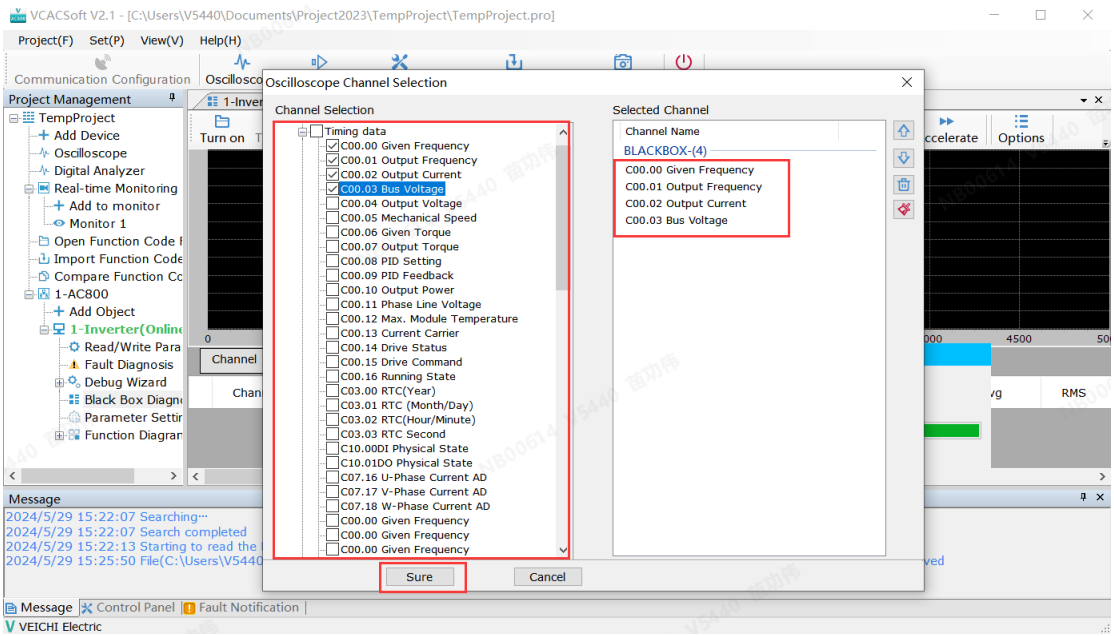


Figure 2-51 View the Channel

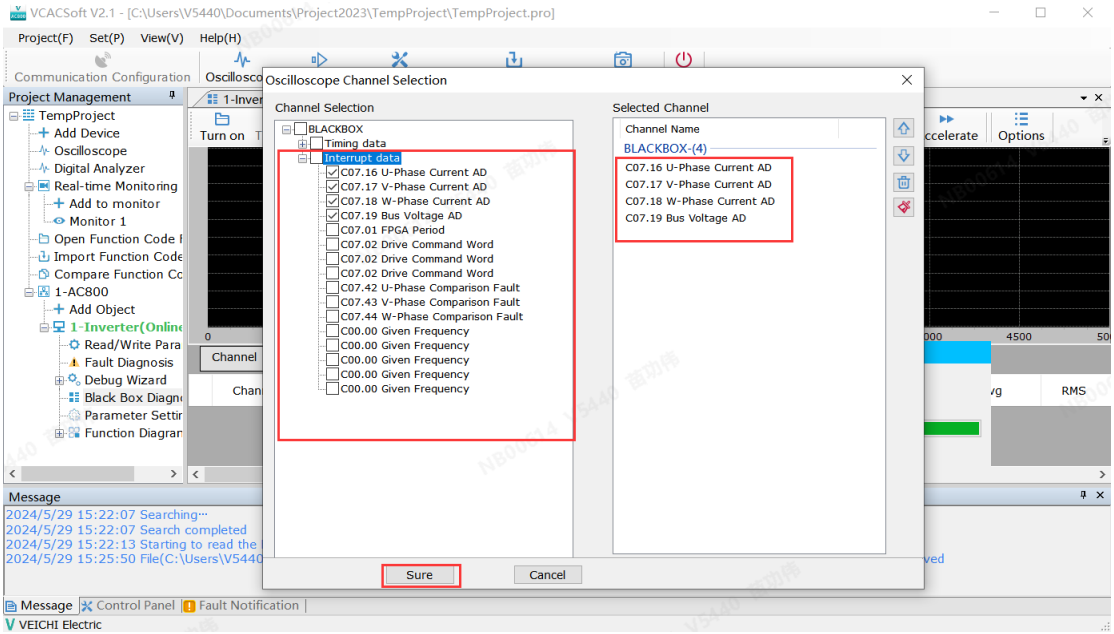


Figure 2-52 Select the Channel

Note: Timed data and interrupt data cannot be selected simultaneously.

5. In the "Digital analyzer" interface, view the data waveform and click "Channel Selection" if you want to change it.

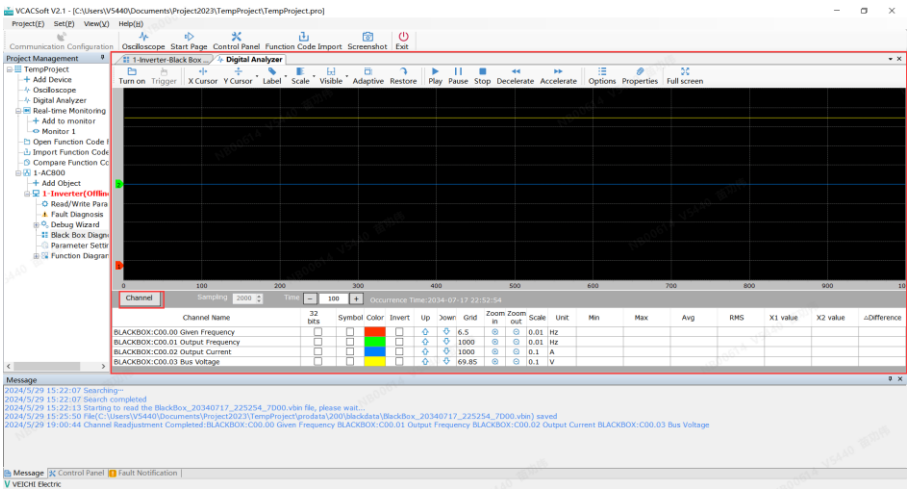


Figure 2-53 View The Data Waveform

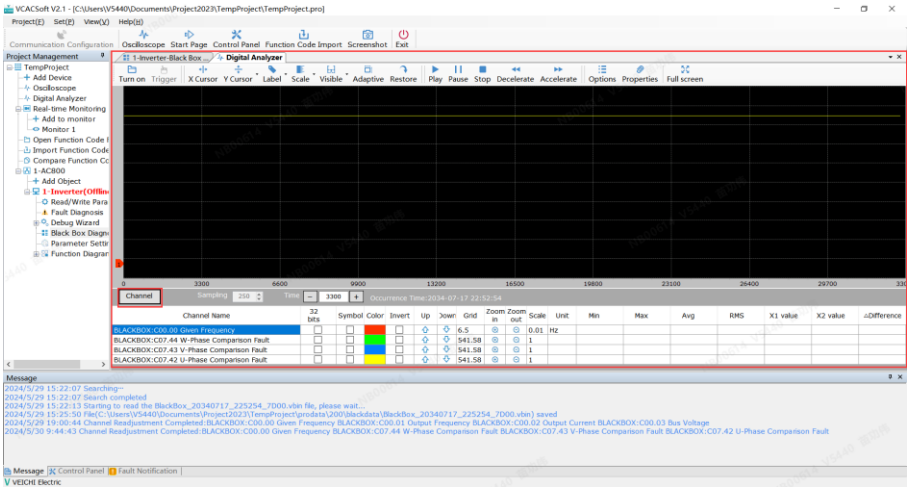


Figure 2-54 Replace the Channel

6. For the fault information that has been read to the host computer, click "View" to check the details. Users can also select one of the faults and click "Delete" to delete it from the SD card.

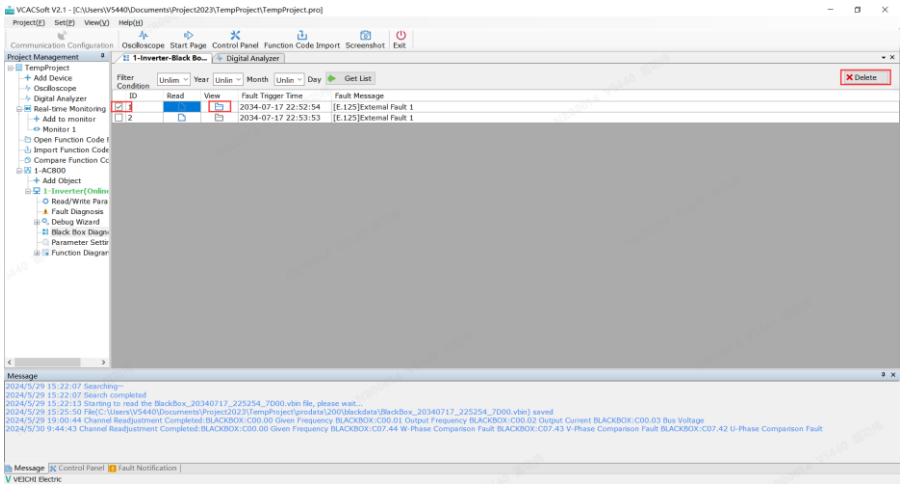


Figure 2-55 View or Delete Faults

2.9 Troubleshooting

Fault diagnosis can read faults on all devices, and provide corresponding measures for reference, and also provide fault reset, fault clear, fault save and such.

Steps

1. Check the current fault.
   1) Select "1-AC800 > 1-Inverter> Troubleshooting" in the “Project Management” section on the left.
   2) Click on "Read fault" to get the current fault information.
   3) Select Status Bar > Fault Notification.
   4) Real-time fault reminder flag in the upper right corner of toolbar.

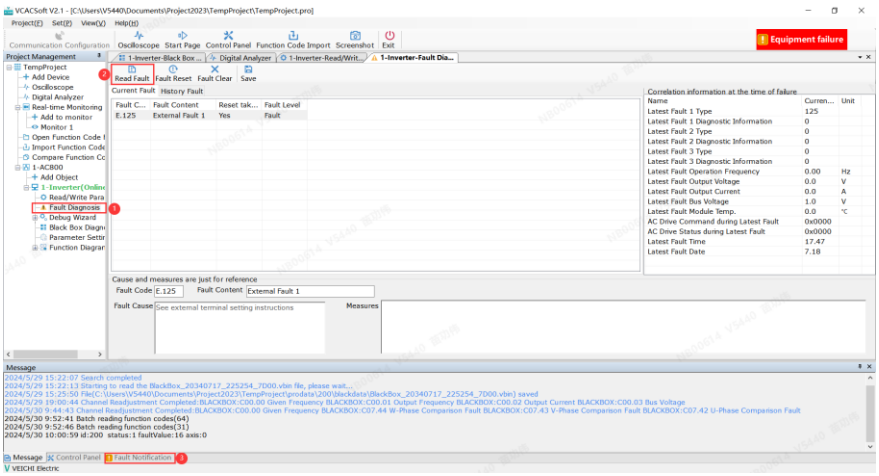


Figure 2-56 View current fault

2. Check the fault history
   1) “History Diagnosis”>“History Fault”
   2) "Read/Write Parameters” > “F9 Group Parameters".

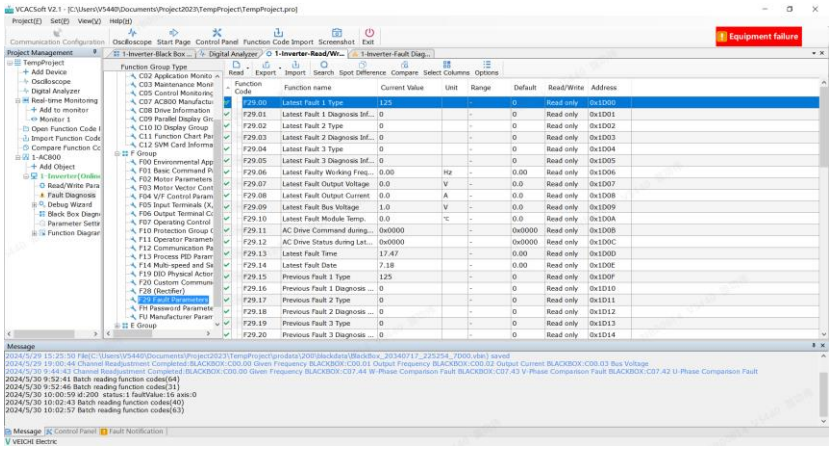


Figure 2-57 Check Fault History

2.10 Motor Auto-Tuning

Steps:

1. Double-click "Project Management > 1-AC800 > 1-Inverter > Motor Auto-tuning" on the left side to open the tuning interface.

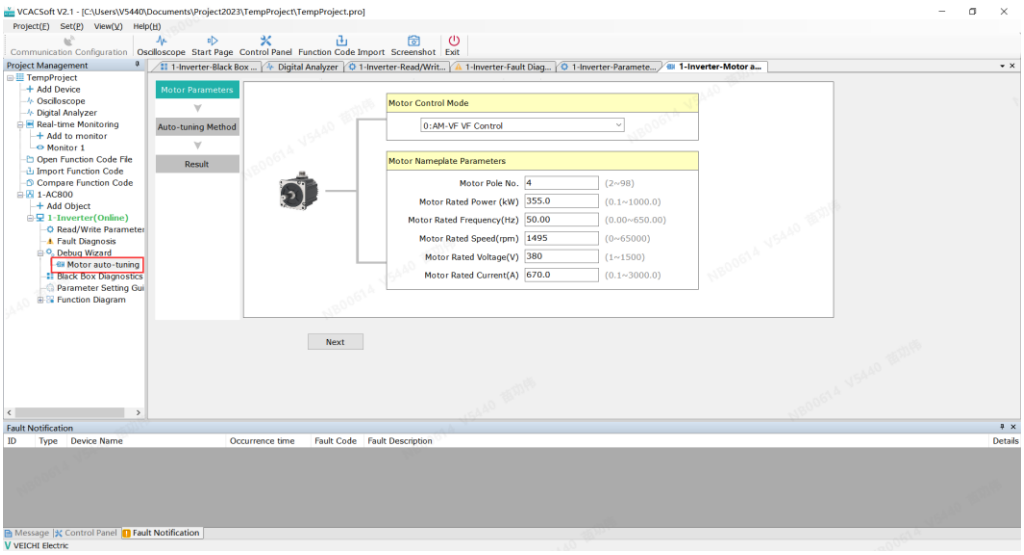


Figure 2-58 Motor Auto-Tuning

2. Enter parameter values according to the motor, and click “Next”.

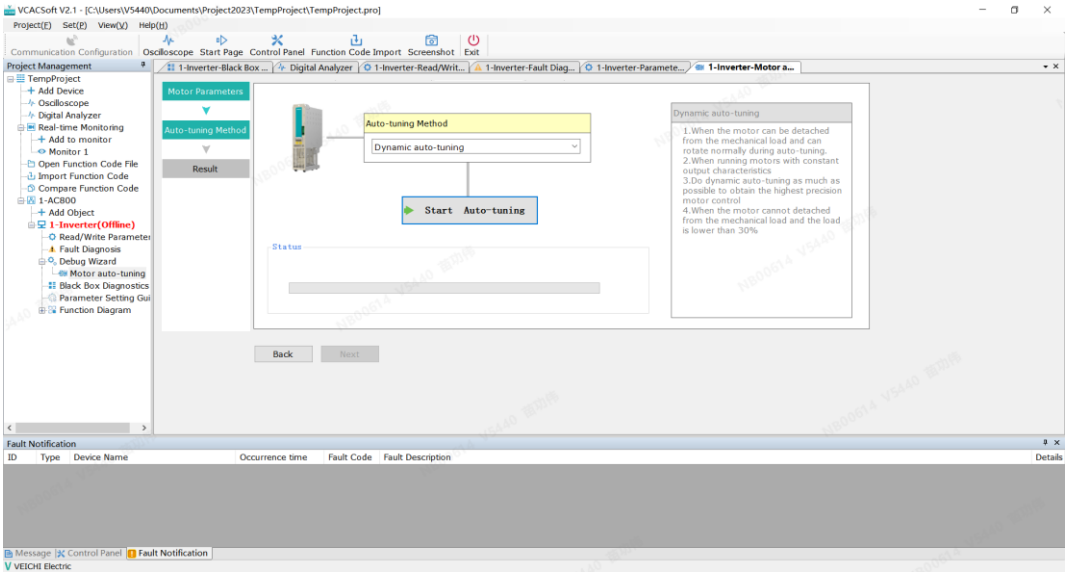


Figure 2-59 Input Parameter

3. Select "Auto-tuning mode", click "Start Auto-tuning” to wait for completion, and then click "Next".

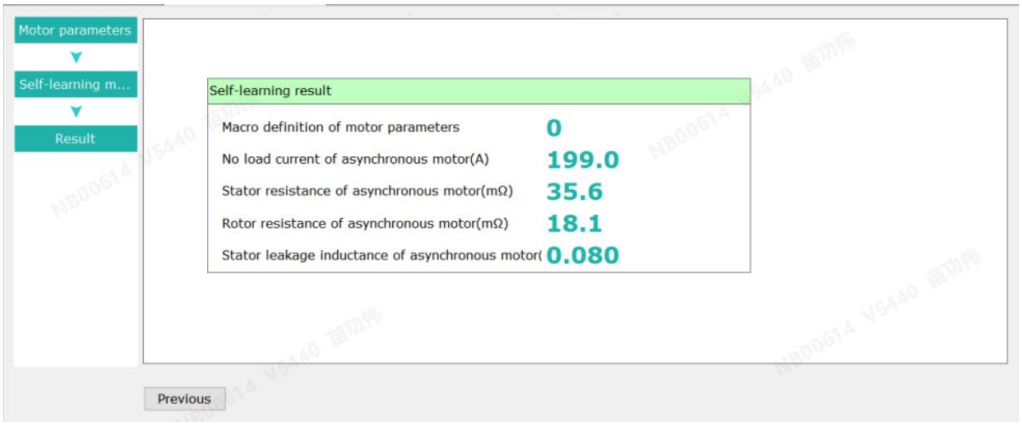


Figure 2-60 Start Auto-Tuning

2.11 Control Panel

The control panel is in the status bar for quick view and common functional parameters debugging for easy operation.

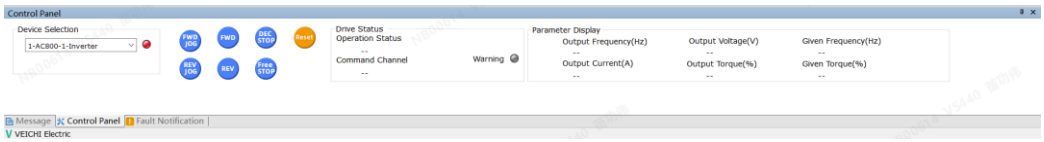


Figure 2-61 Control Panel

2.12 Parameters Setting Guide

Parameter setting wizard is user-friendly mainly for new users who are unfamiliar with parameter setting. Parameter setting wizard is intuitive and classified according to debugging functions. It helps users easily set and adjust parameters in projects with simplified steps. Users can quickly try different parameter combinations to get the best configuration solutions without time wasted to get the specific meaning and purpose of each parameter. This method is especially suitable for systems with various parameters and complex configuration to make the debugging process more efficient and convenient.

The rectifier and inverter of AC800 have different parameter setting wizard flow.

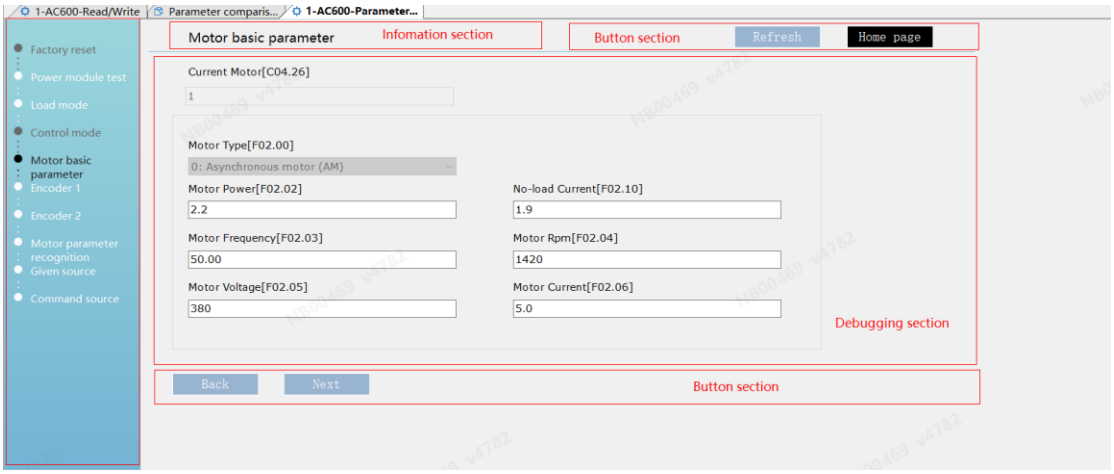


Figure 2-62: Motor Parameters

- **Wizard area:**Identify the debug wizard sequence and debug function names. Among the dots in front, white indicates unfinished, gray indicates finished, and black indicates those are under progress. Click the feature entries in the wizard area, and the page jumps accordingly, the parameters on the page before jumping will not be written.
- **Information display area:**Displays the name of the current page.
- **Debugging area:**Debug the parameters and description pictures involved in the function. When offline, the drop-down parameter defaults to 0 and the input box is empty. When online, when the page is newly entered or refreshed, the parameters are read from the device, and when clicked "Back to Home Page", "Back" and "Next", the parameters of the current page are written. Please make sure the parameters are written before clicking since “Refresh” will overwrite unwritten parameters.
- **Button area:**
  - When "Refresh" is online, read the current page parameters from the device and update the page parameter values.
  - "Return to Home Page" jumps from the current page to the first page of the wizard, writes the parameters of the current page to the device, reads the parameters of the next page from the device, and updates the page to be displayed.
  - "Back" jumps from the current page to the previous page, writes the parameters of the current page to the device, reads the parameters of the next page from the device, and updates the page to be displayed. There is no "Back" button on the home page.

- "Next" jumps from the current page to the next page, writes the parameters of the current page to the device, reads the parameters of the next page from the device, and updates it on the page to be displayed. There is no ”Next” button on the last page.
- Click "***Finish***" button at the end of the page to write parameters on the current page.

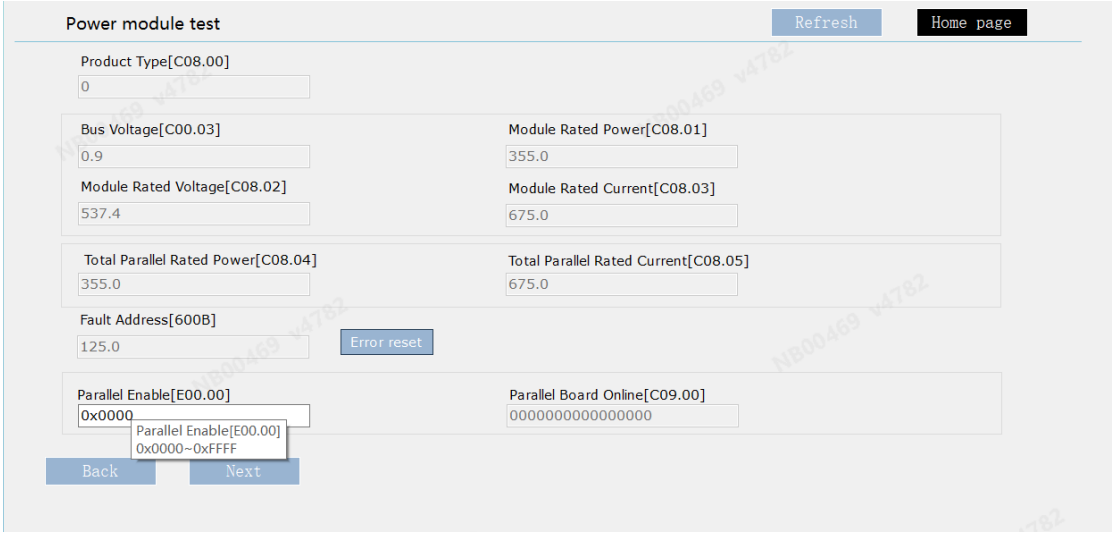


Figure 2-63: Power Module

Read-only parameters cannot be modified. Move the mouse to modify the parameters to display the unit and range.

Button contains a series of operations corresponding to the button names, such as writing one or more values, reading one or more values after writing, and so on.

2.13 Function Flow

Function diagram is a graphical debugging method, which is mainly for users who know the underlying logic. Select the control mode from the home page, and start debugging the corresponding page according to the guide, or return to the previous/next debugging page by “Back” and “Next” buttons. At present, only AC800 inverter module supports this function diagram.

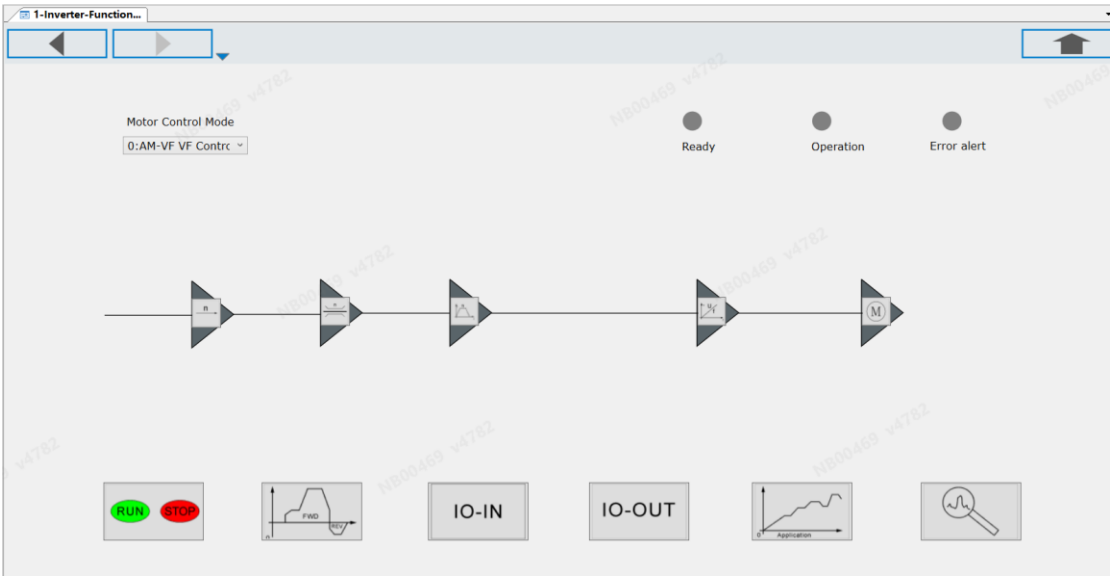


Figure 2-64 Function Flow Home Page

The parameters in the page are refreshed in real time (the minimum refresh frequency is 500ms, and this can be set in Settings/System Configuration/System Parameter/Function Diagram), and the parameters are automatically written when they lose focus. If the cursor stays in an input box, the value here can be edited and will not be refreshed. Press enter to make the cursor out of focus and update.

Note: Enter, move the cursor to another input box, minimize and page switch will cause the cursor to lose focus and the data will be written to the device.

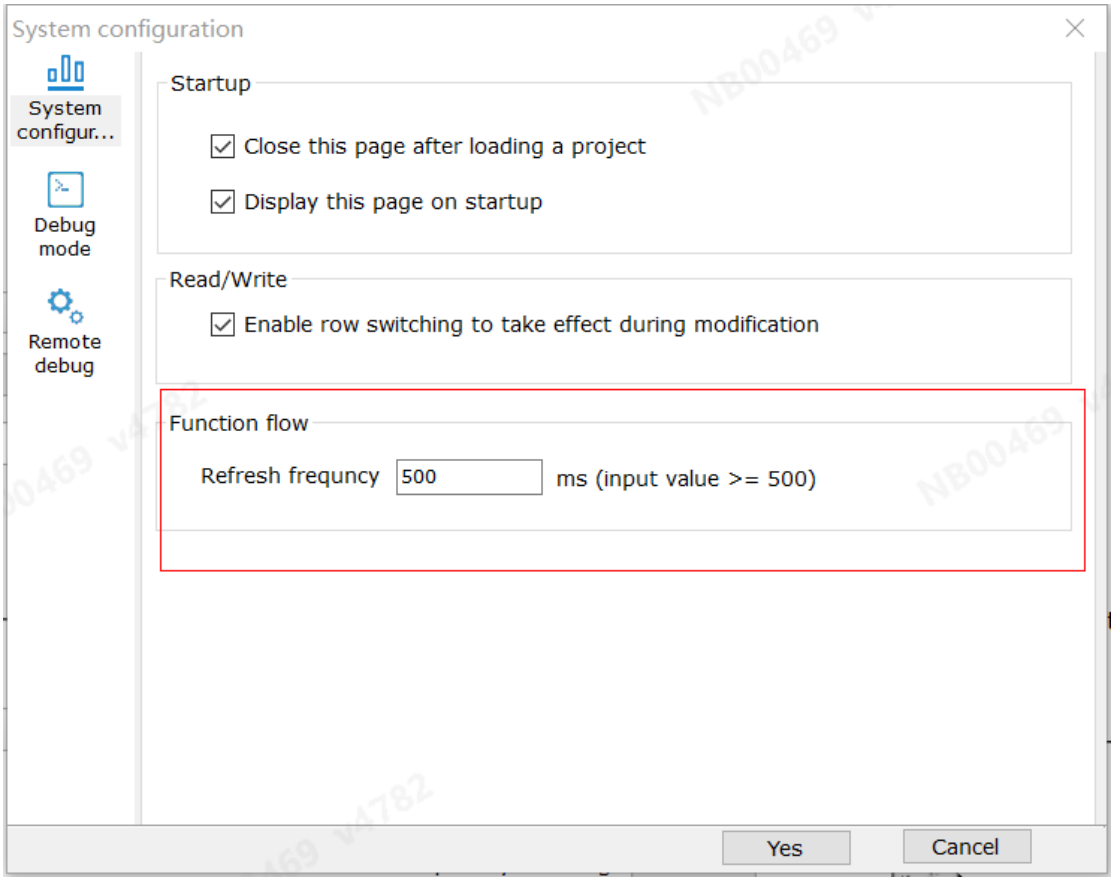


Figure 2-65 System Configuration

The page contains the following controls:

- Input box: When the device is offline, it is empty or the value of the previous operation will be displayed; After the device is online, it will automatically read the input box data (according to the corresponding system). The input box loses focus and the data is automatically written into the device. Mouse hovering in the box will display parameter prefix + value range + unit (if any).
- Drop-down box: When the device is offline, select the first item by default or display the option when the device was online last time; After the device is online, select the corresponding options of the current parameters, such as associating other controls such as display/switch/hide. Modify the drop-down option to automatically write data to the device. Hold the mouse over the drop-down box to display parameter prefix + unit (if any).
- Subcode drop-down box: When the device is offline, select the first item by default or display the option when the device was online last time; While after the device is online, select the corresponding option of the current parameter. Modify the drop-down option to automatically write data to the device. The name of subcode can be configured as function code name/function code name + subcode

name/subcode name up to models.

- LED indicator: When the device is offline, it defaults to green; After the device is online, the associated parameters true or 1 will be in green light, and false or 0 in gray. This parameter cannot be modified. Hold the mouse over LED indicators to display the corresponding parameter prefixes.
- 2-way switching quantity: when the device is offline, it is set to 0 by default; After it is online, if the associated parameter is 0, dial to 0. If it is 1, dial to 1. Hold the mouse stays on the switch quantity to display the corresponding parameter prefixes.
- 4-way switching quantity: when the device is offline, it is set to 0 by default; After the device is on-line, the associated parameters are the calculation results of the low and high values of the two parameters, if the associated parameter is 0~3, dial to 0~3 respectively. Hold the mouse on the switch quantity to display the corresponding parameter prefixes.
- 16-way switching quantity: when the device is offline, it is set to 0 by default; After it is on-line, the correlation parameters are the calculation results of the low and high values of the four parameters , if the associated parameter is 0~15, dial to 0~15 respectively. Hold the mouse on the switch quantity to display the corresponding parameter prefixes.

The mouse gets near but the parameters show no tips, indicating that the corresponding parameters are not found in the parameter table, which is applied to all parameters above.

- Pop-up: After clicking, a new sub-page will pop up, its control display logic the same as above. If the pop-up page is not closed, the same window or other function diagram sub-pages cannot be opened, and the page cannot jump to other function diagram pages without closing. However, other tree node pages can be opened, such as reading and writing parameters.
- Jump button: Move the mouse into the display page to display information, and after clicking, the page jumps to other pages, its control display logic the same as above.
- The current page name is displayed on the page tab, and only one page is displayed on the function diagram tab, and only the current page name is displayed then.
- If the clicked root node is the parent node and there is no specific page, the first

child node page will be displayed by default. Click the function map to display the home page by default.

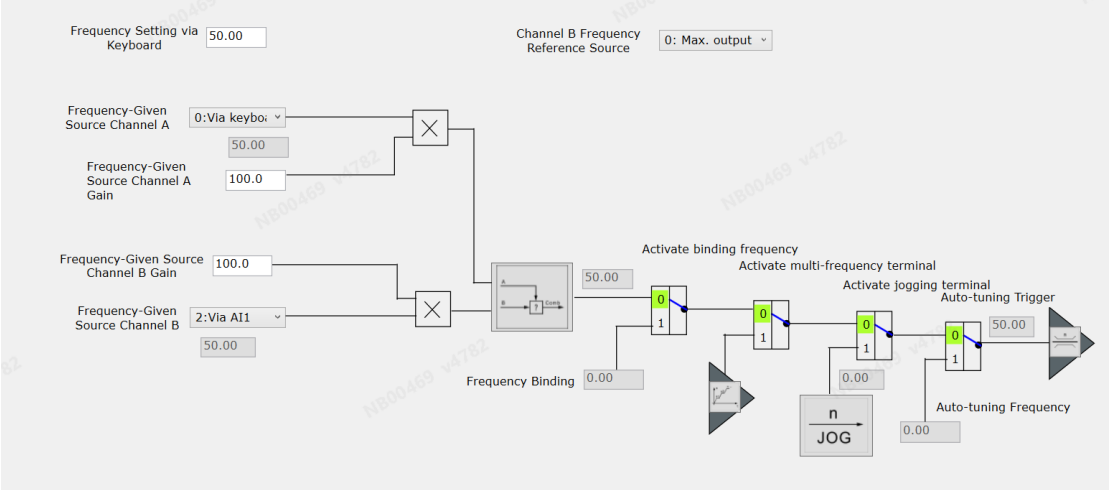


Figure 2-66 Frequency Command Giving

The following are representative pages:

1. Home (online/offline)

VF Mode(F01.00=0/10/20)

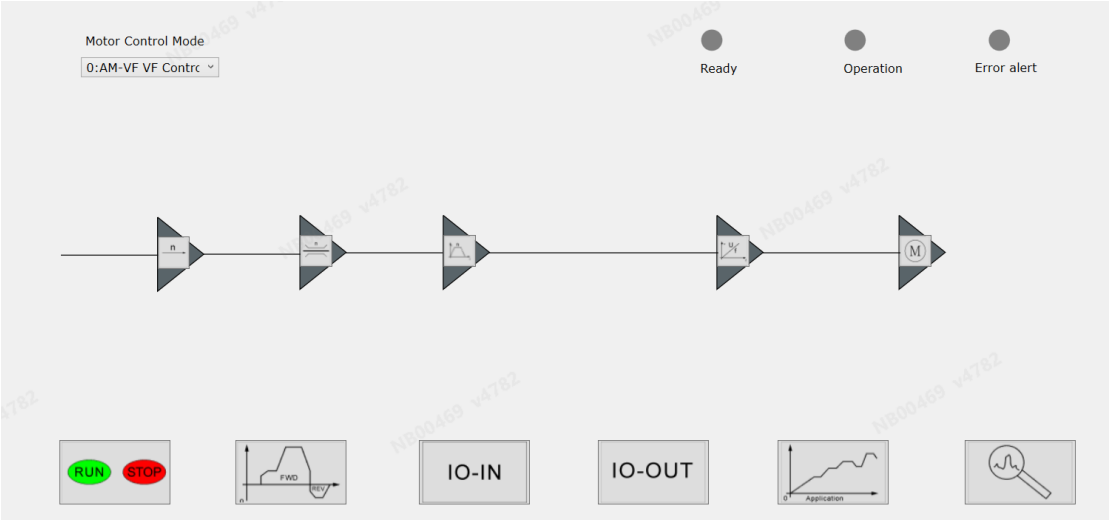


Figure 2-67 Select VF

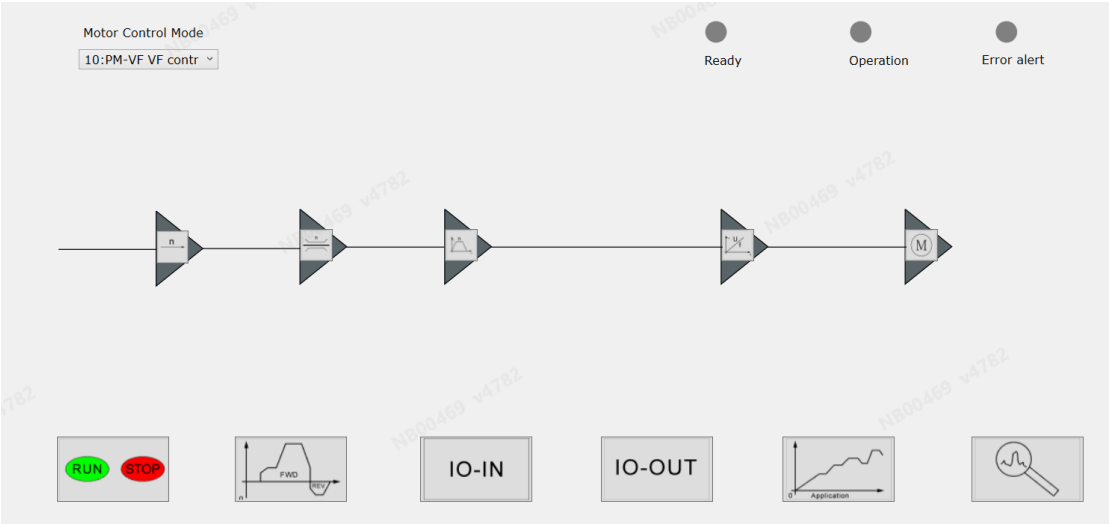


Figure 2-68 Select PM- VF

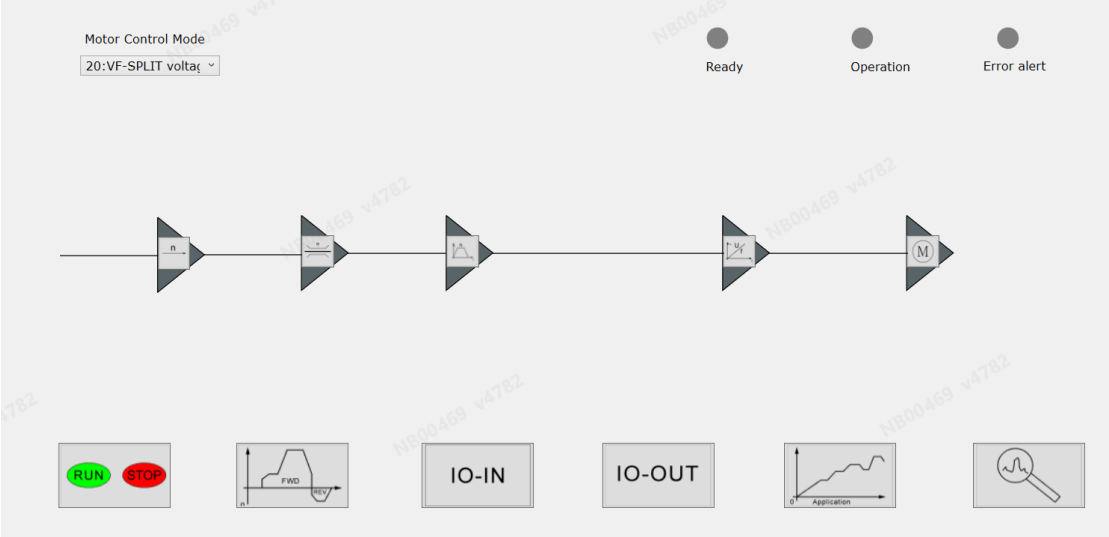


Figure 2-69 Select VF- SPLI

Vector Mode (F01.00 = 1/2/11/12) + Torque Mode (F03.40=1)

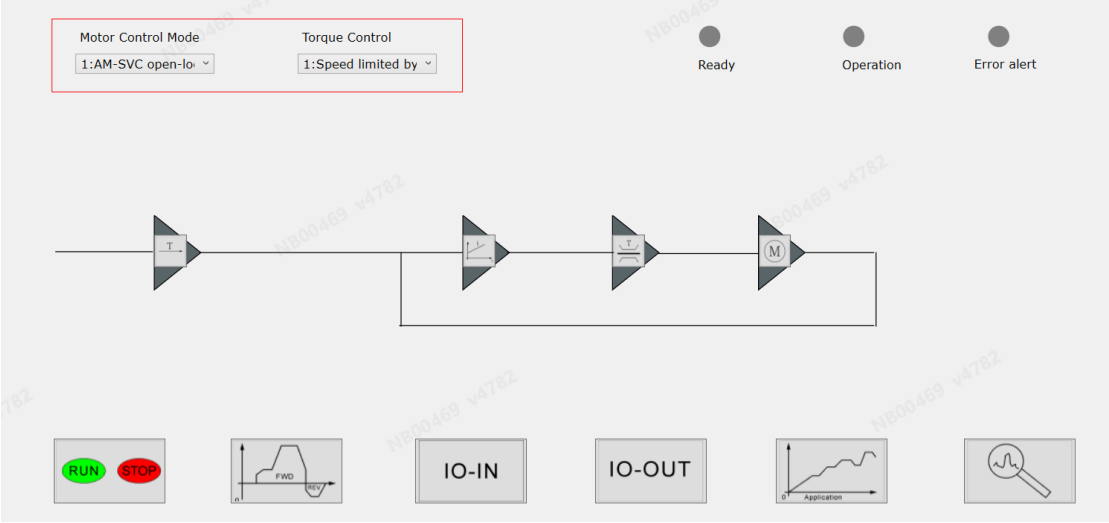


Figure 2-70 Select AM- SVC

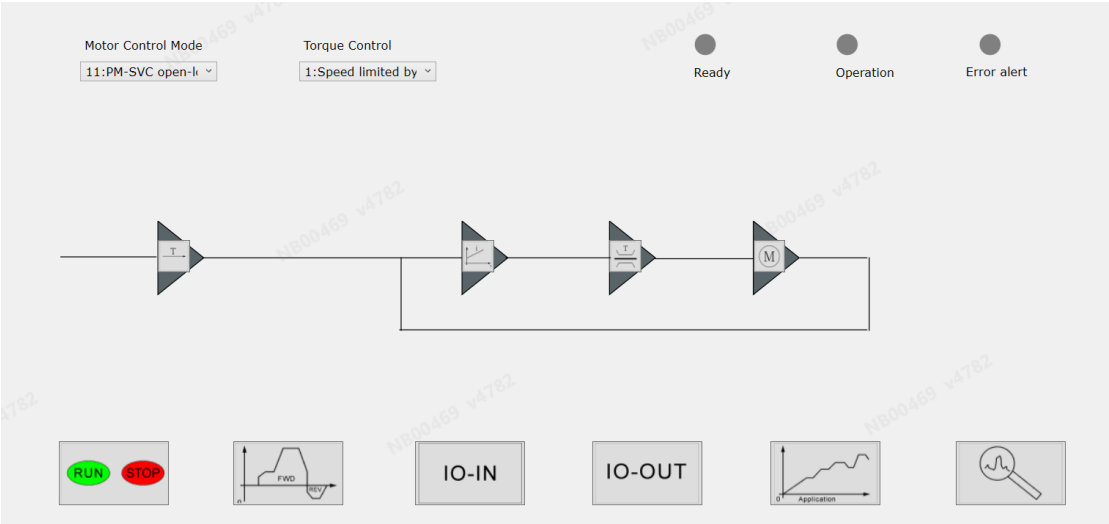


Figure 2-71 Select AM- FVC

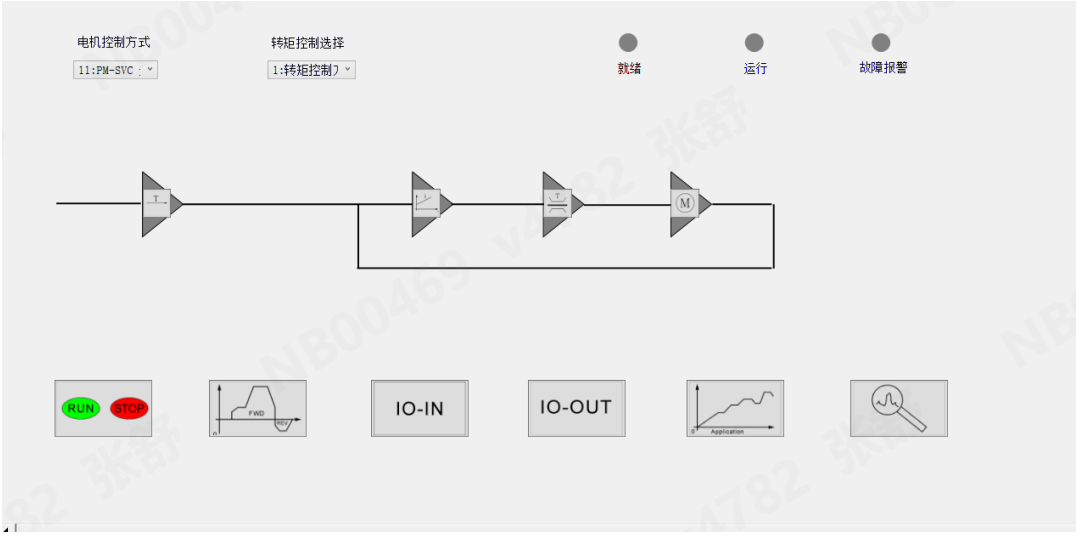


Figure 2-72 Select PM- SVC

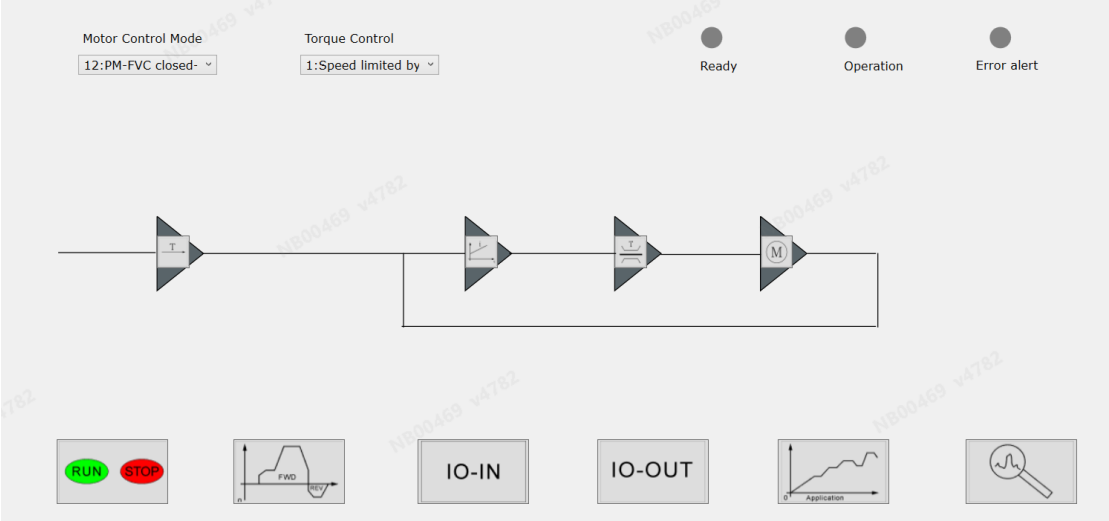


Figure 2-73 Select PM- FVC

Vector Mode (F01.00 = 1/2/11/12) Simultaneous Speed Mode (F03.40 = 0)

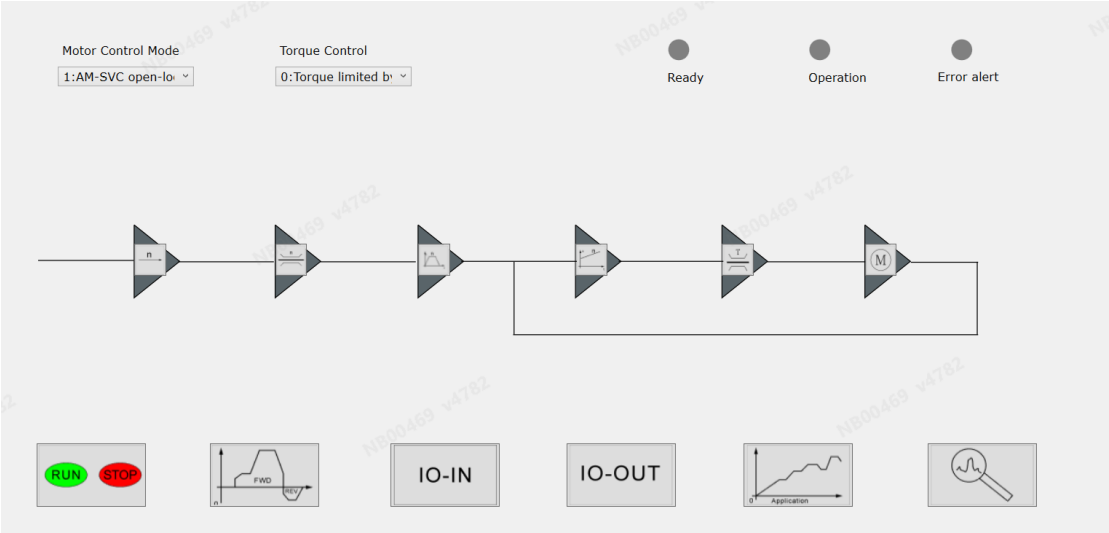


Figure 2-74 Select AM- SVC

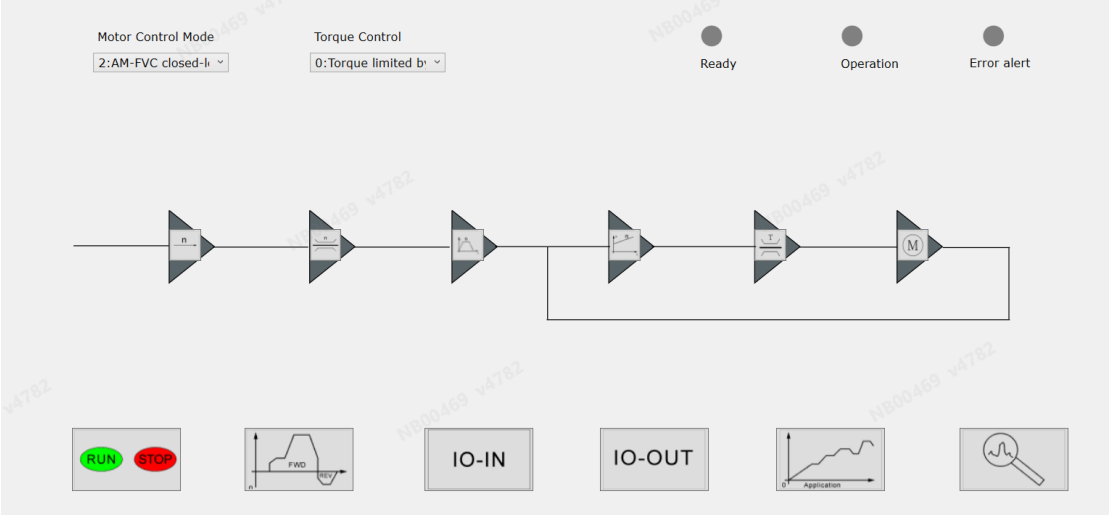


Figure 2-75 Select AM- FVC

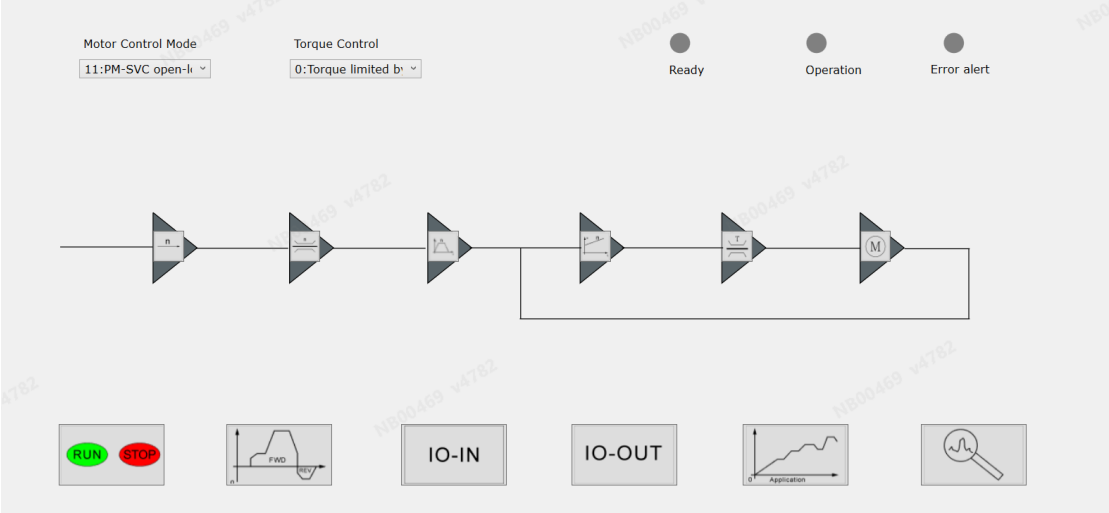


Figure 2-76 Select PM- SVC

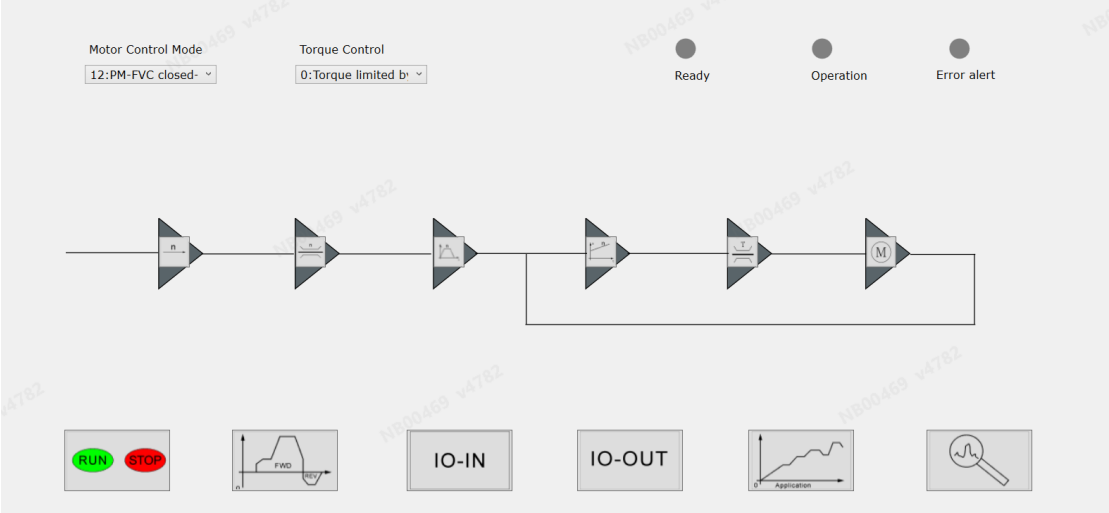


Figure 2-77 Select PM- FVC

2. V/F control

When F01.00=20, the page shows:

When the automatic ECO control is 1, the energy saving control button is displayed.

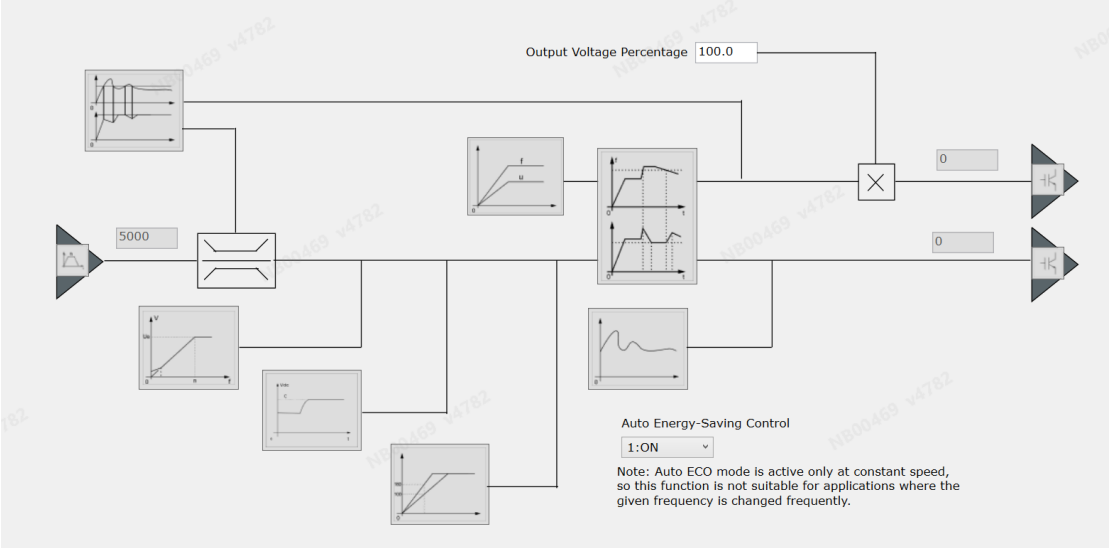


Figure 2-78 Energy Saving Control Button Display

When the automatic ECO control is 0, the energy saving control button is not displayed.

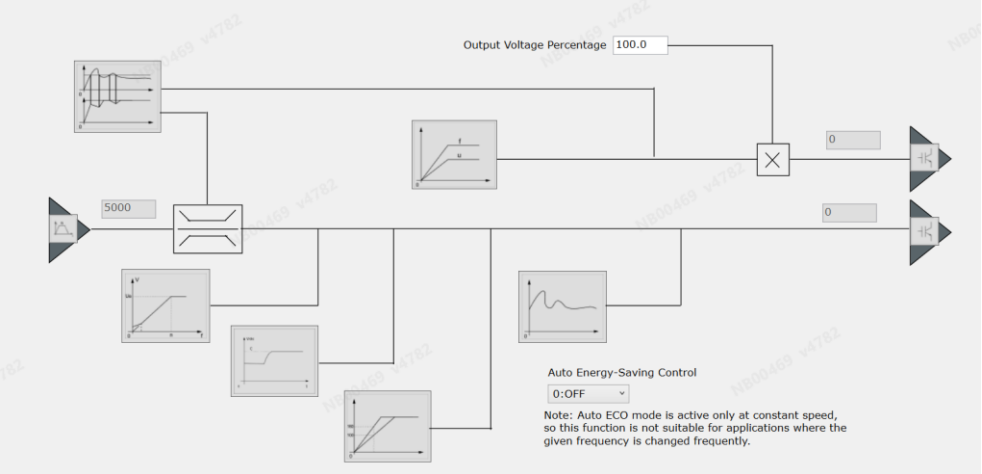


Figure 2-79 No Energy Saving Control Button Display

F01.00 = 0 or 10, the page appears as follows:

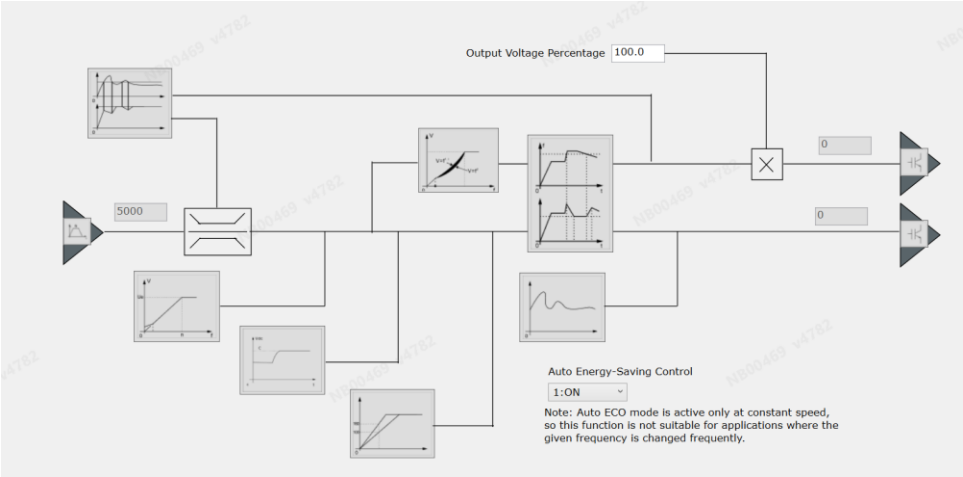


Figure 2-80 Page Display when F01.00 = 0 or 10

VF curve:

When VF curve is selected to 0:

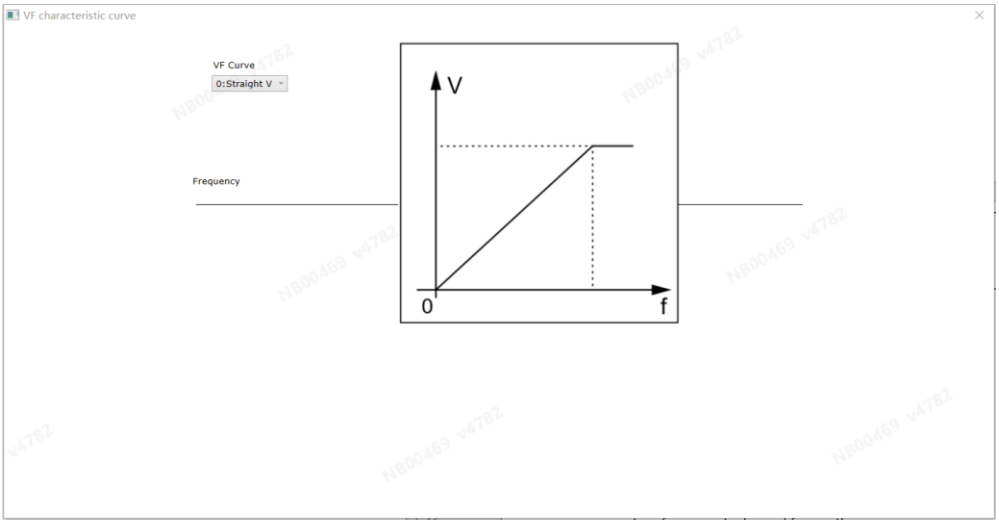


Figure 2-81 Display with VF Curve to 0

When VF curve is selected to 1~10:

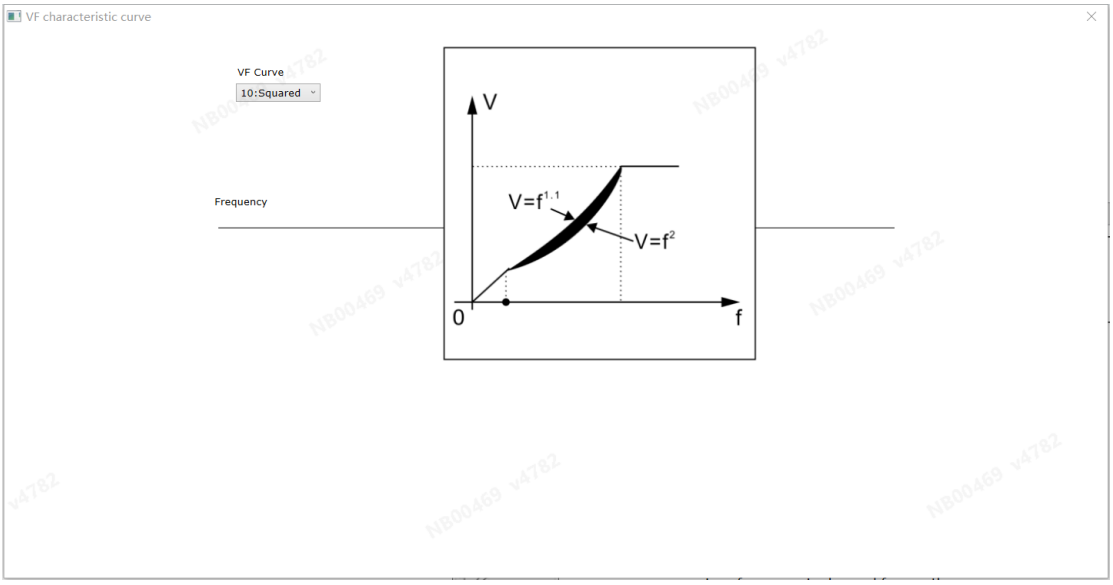


Figure 2-82 Display with VF Curve to 1~10

When VF curve is selected to 11:

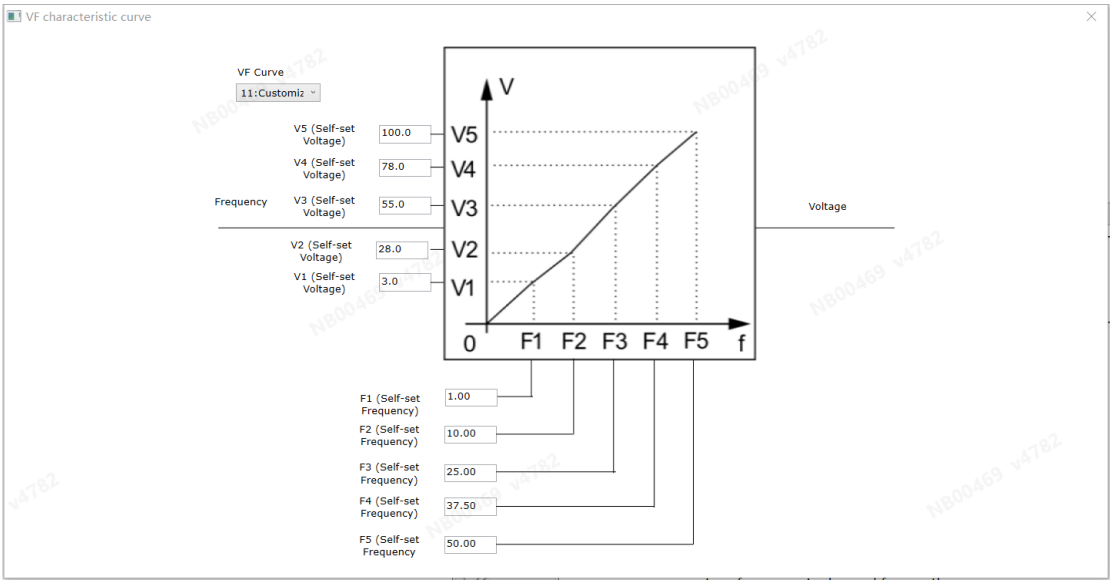


Figure 2-83 Display with VF Curve to 11

3. Vector control

Torque control page:

The torque command on this page is given to [Channel A], and the [Channel A] corresponds to two bits of a parameter.

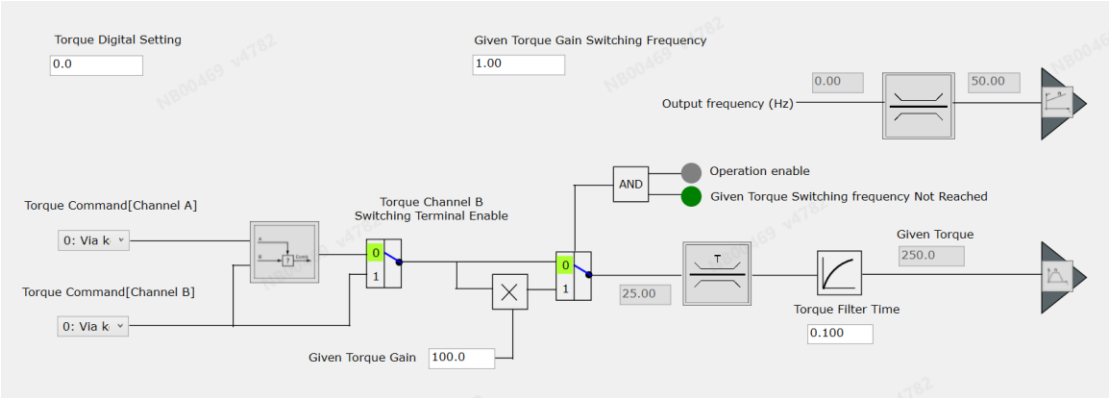


Figure 2-84 Torque Control

Pop-up: Speed limit

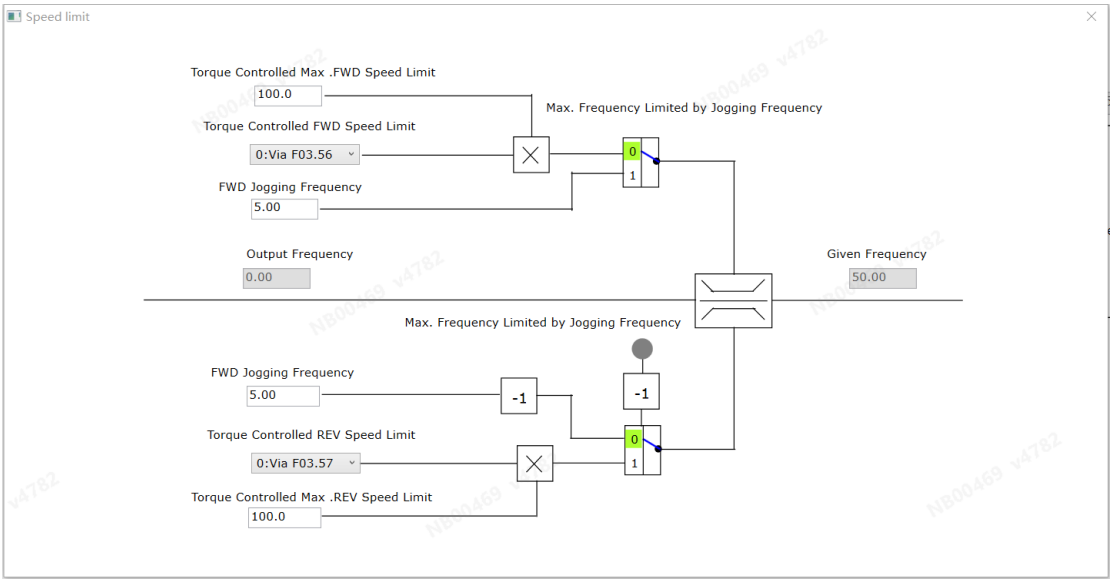


Figure 2-85 Torque Limit

There are two functions with the same name "Electric Forward Frequency" in the page. When there are two parameters with the same name in the page, the one with the cursor staying means it is edited, and the other is from the device. If you press enter, the edited value will be written, and the other will be updated to the edited value. If the cursor moves to the parameter with the same name after the edited value is written, and value will not be updated due to the cursor. Therefore, please write by enter key when there are several parameters under the same name to avoid repeated rewriting due to untimely data update.

4. Input terminal

AI page:

- bit0 ~ 1 of AI port digital input terminal characteristic(F05.80) corresponds to [AI1 Polarity] selection and [AI2 Polarity] respectively.

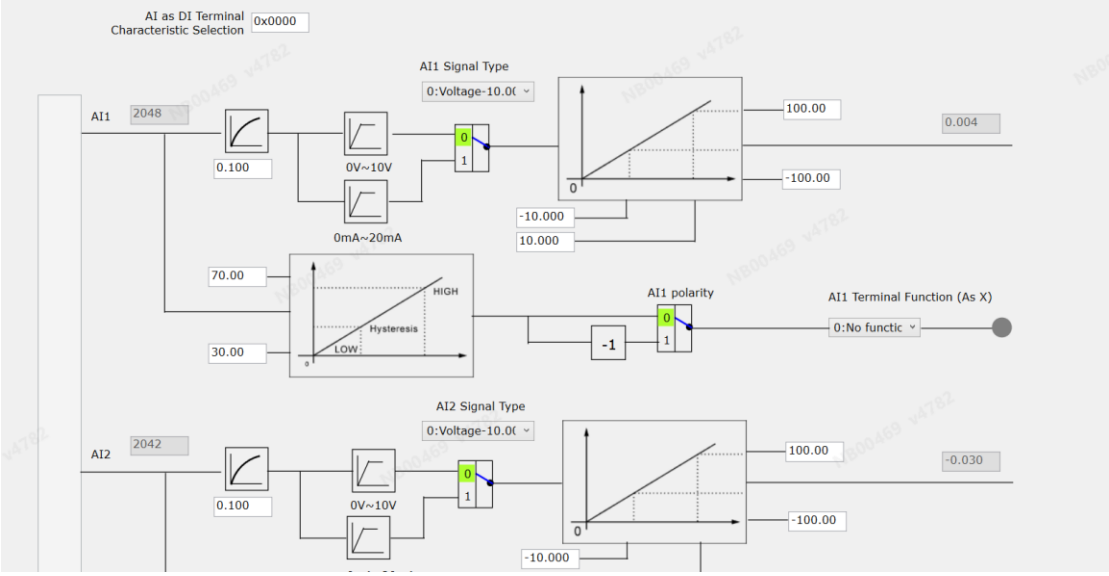


Figure 2-86 AI

DI page

- bit0 ~ 8 of DI1 ~ HDI2 terminal characteristic(F19.18) corresponds to the switching values of [DI1 Polarity] ~ [HDI2 Polarity] respectively, if bit is 1, and set switching value to 1.
- LED indicators associate bit0 ~ 8 of C10.00 from top to bottom, respectively

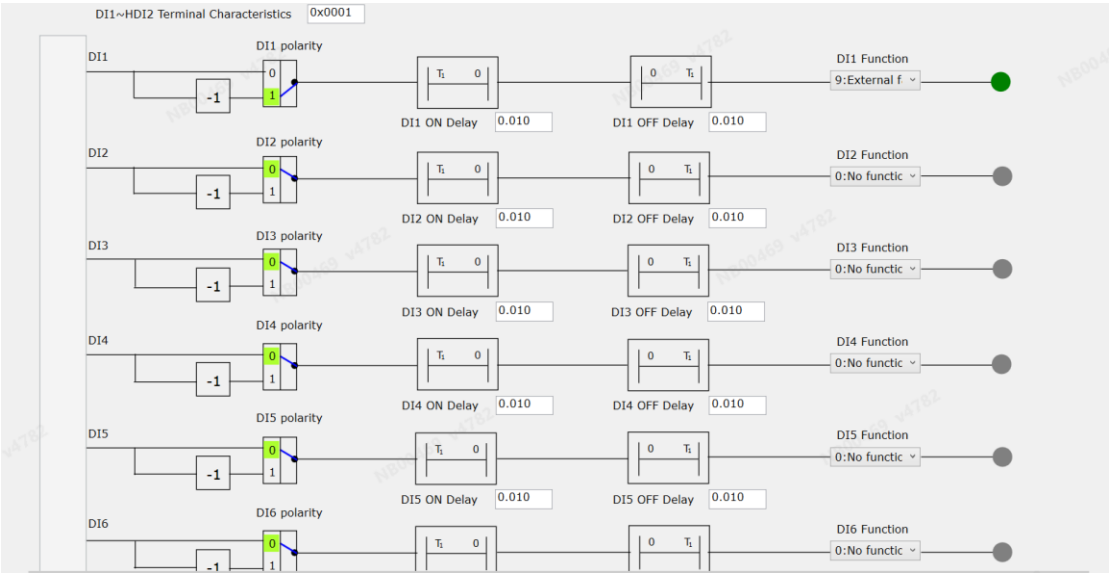


Figure 2-87 DI

5. Output terminal

AO page:

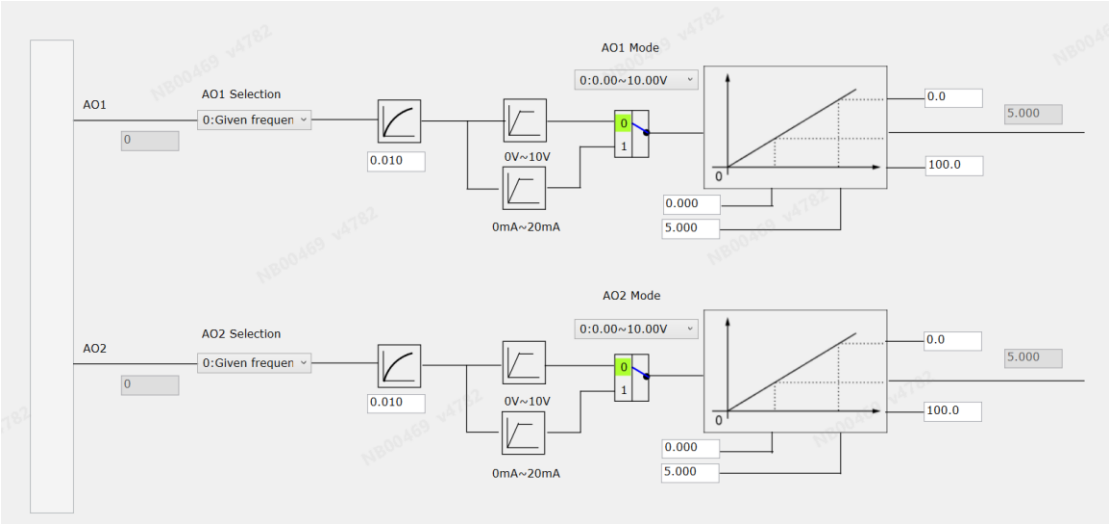


Figure 2-88 AO

DO page

- bit0 and bit1 of HDO1 and HDO2 positive and negative logic (F19.29) correspond to [HDO1 Polarity] and [HDO2 Polarity] respectively.
- bit0, bit1 and bit2 of RDO1, RDO2 and RDO3 positive and negative logic (F19.30) correspond to [RDO1 Polarity] , [RDO2 Polarity] and [RDO3 Polarity] respectively.
- LED indicators correspond to bit0 ~ 4 of C10.01 respectively.

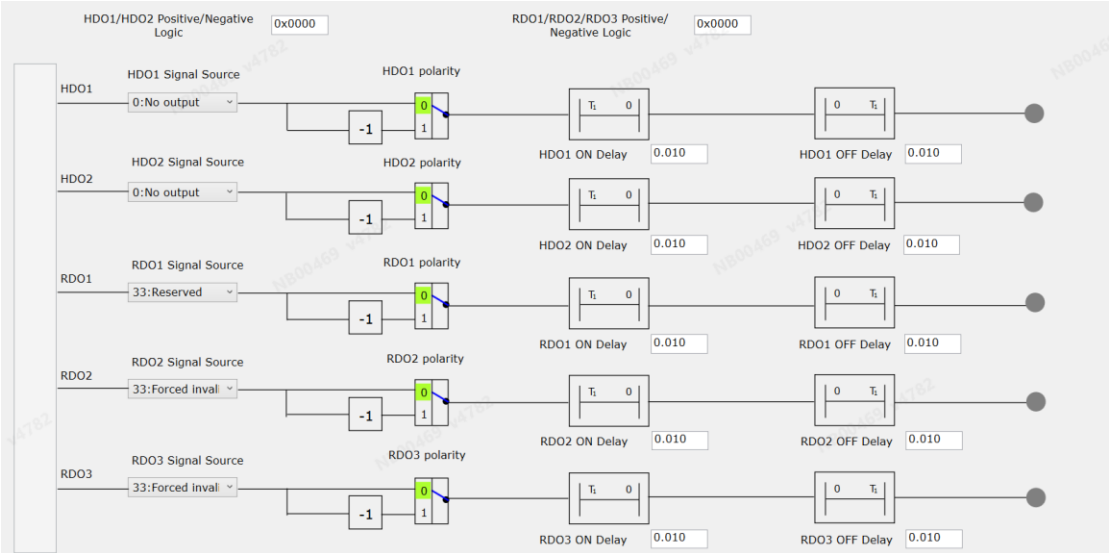


Figure 2-89 DO

6. Application Function

Multi-segment speed

"Or" logic among multi-segment speed terminal 1, terminal 2, terminal 3 and terminal 4 means that, as long as there is a terminal set to 1, the multi-segment

speed terminal LED indicator is on.

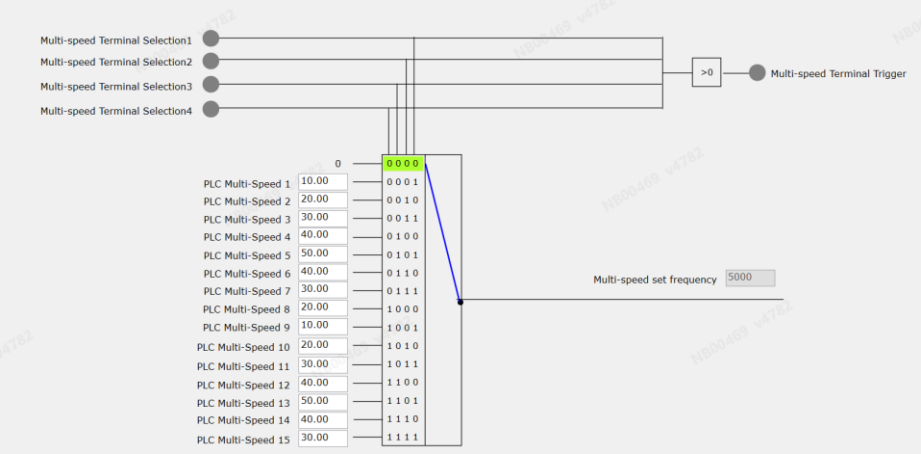


Figure 2-90 Multi-segment Speed

PID page:

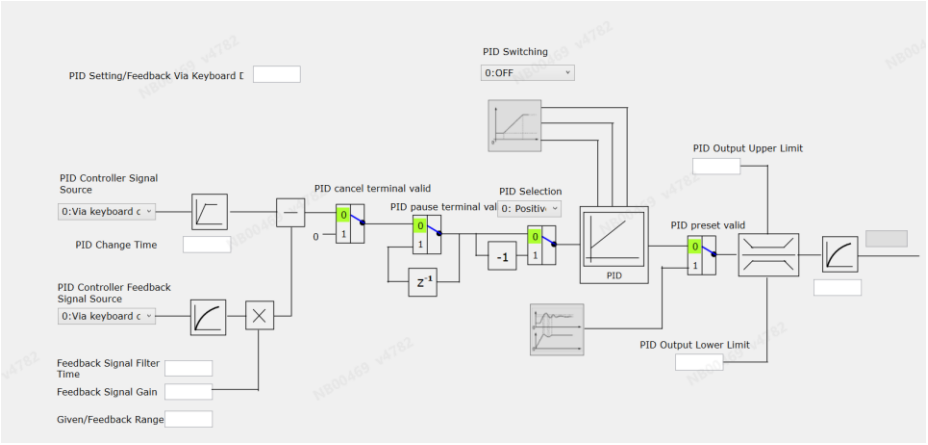


Figure 2-91 PID

F13.17[PID Parameter Switching Condition] selection corresponds to different PID selection pages to pop up:

Select 0:

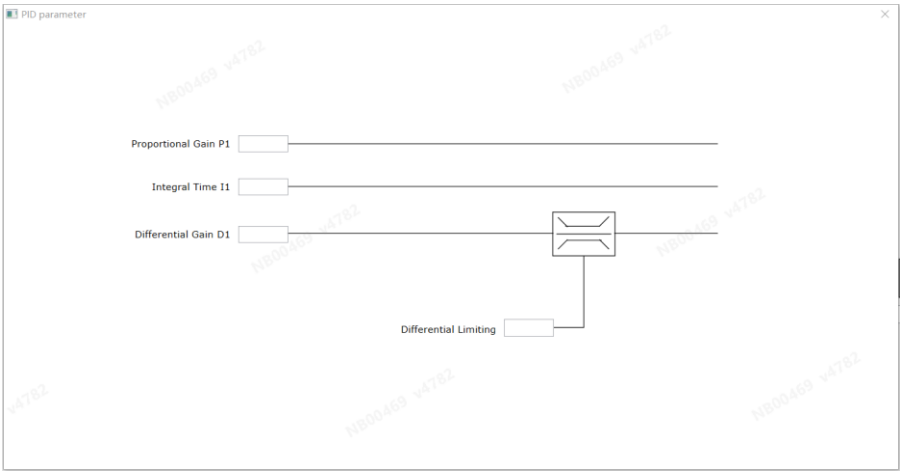


Figure 2-92 Page under 0

Select 1:

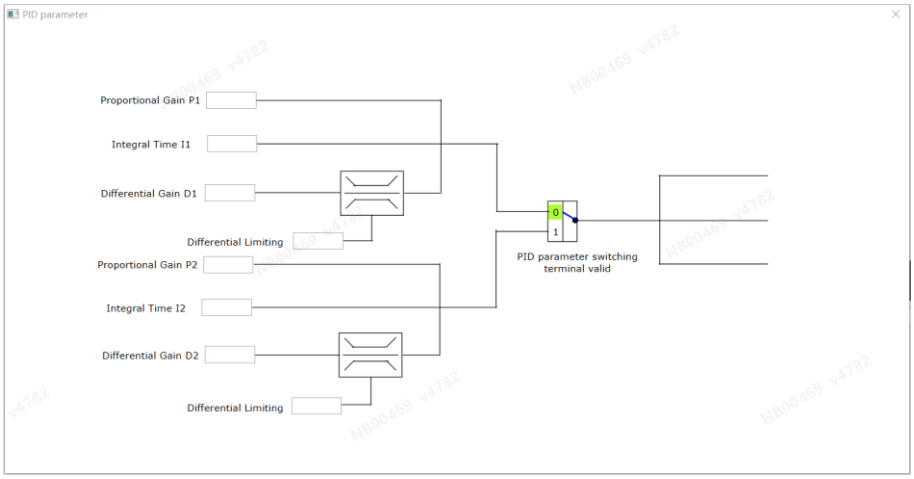


Figure 2-93 Page under 1

Select 2:

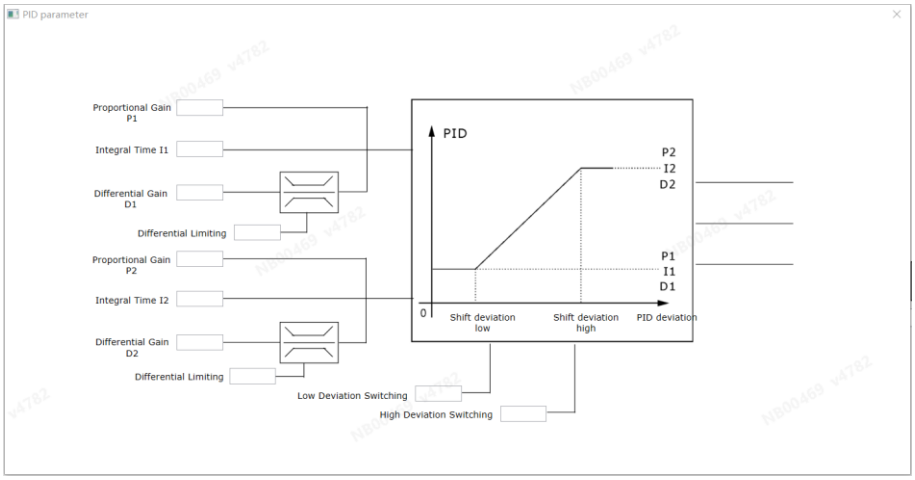


Figure 2-94 Page under 2

7. Fault information page:

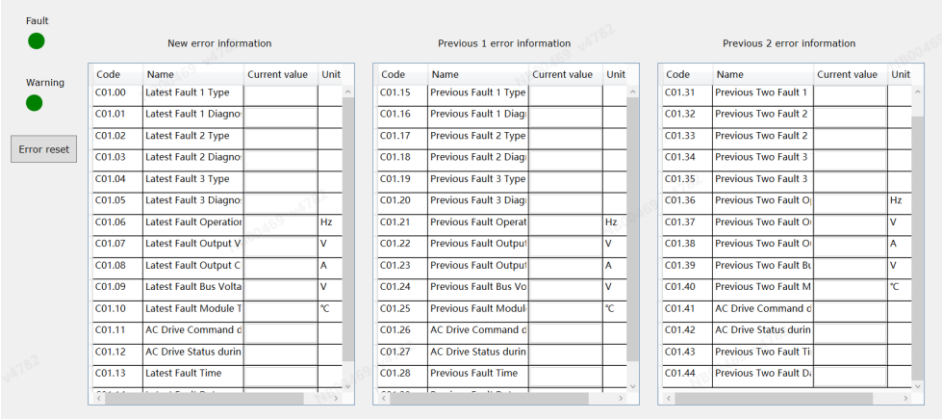


Figure 2-95 Fault Message Viewing

Click “Fault Reset”, and writes the default value of 7 to 0x6001.

2.14 Free Programming

There are currently 10 free modules, each with 3 inputs, 1 output and 1 module status. The inputs, outputs and statuses of all free modules are displayed through the U07 connector and in the visual programming module of the host computer.
Free programming is currently only supported by the AC600, and the following is an example of an AC600 application.

2.14.1 Interface Functions

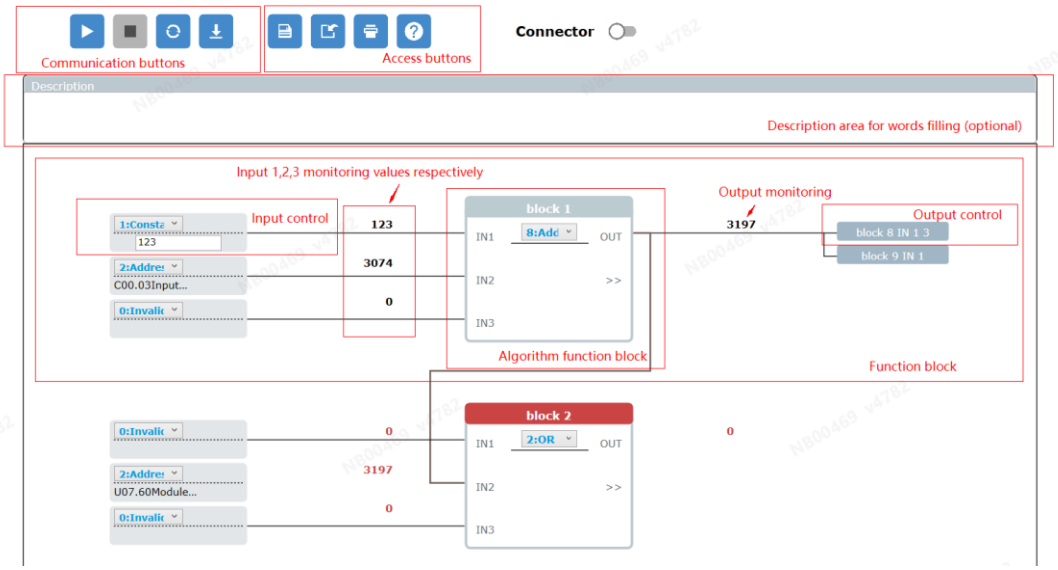


Figure 2-96 Interface Layout

The top row toolbars are:

1. Communication buttons

Start Monitor: Users can choose to read the control parameters (L00) and monitor parameters (U07) after writing, or you can choose not to write them and read them directly. The refresh interval is 1s for control parameters and 200ms for monitoring parameters.

Stop monitor: Stop reading control parameters (L00) and monitoring parameters (U07) and real-time refresh.

Refresh: Read the control parameters (L00) and monitoring parameters (U07) from the device on the current page and updates the parameter values and connections.

Download: Write the page parameters to the device

2. Access buttons

Export: Save the current settings as a free programming file, which can be imported

and downloaded in other devices. Exportable formats includes *.param and *.xls, *.param files can be opened in the [Open Funcode File] and [Free Programming] pages, while *.xls files can't be loaded on the upper computer, read only.

Import: Import the stored free programming file (*.param), automatically load the page parameter values and connections,while the original settings of the page will be overwritten.

If open an existing project, when the free programming is loading, it will automatically check whether there is a free programming file in the directory where the project is opened, and if there is, the data in it (i.e., the value of the last editing) will be loaded; if not, it will be loaded in the same way as the free programming of the newly created project. Theoretically, the loaded free programming file and the saved free programming file are not the same, unless the user saves the path in the directory where the project is located. If you want to change the setting of automatic loading of free programming for your project, manually click the "Import" button and select the desired free programming file.

Connector enable: To use the free programming function, connector is required to be enabled.

The network blocks are respectively:

Description: Optional, the description area can be filled in with text for recording the functions.

Function block: Each function block includes 3 input controls, one for function calculation, and several output controls (0~5).

Fault mark: When the function block and monitoring value is red, it means that there is an error in the parameter of this function block, please check whether the data setting is in accordance with the algorithm or whether there is any overflow. It is blue-gray when normal.

Input control

- 0: Invalid. Automatically changes to 0 when the other associated function block outputs are removed due to non-input control modifications.
- 1: Constant. The input control appears as a constant input box, carriage return or out of focus updates the modified value, if downloaded this modified value is written to the device. Refresh this modified value to overwrite it with the device value.
- 2: Address. Select the any parameter group in the pop-up box, click OK to display

the parameter number + name below. Move the mouse to see the prompt text, it is parameter number + name [parameter address]. If you want to download it, the parameter address is written to the corresponding parameter, such as input 1 type of function block 1 corresponds to the parameter L00.01. Select F00.01, then write the address of the F00.01 to L00.01. If U07.64 is selected, the output of function block 2 is used as the input of input 1 of function block 1, and the address 0xA764 of U07.64 is written to L00.01.

- 3: Bitwise operation of address parameters When the bit box appears, set the parameter value corresponding to the id (e.g. U07.64) to the bit.

Calculation function block: It consists of function block number, algorithm selection, 3 inputs and 1 output. Inputs and outputs have their own separate right-click menus. Refer to the Device Measurement Test Requirements for a description of the operational logic.

Output control: When the output menu of a function block is selected with a function block of the other network block, it will display that the function block that cannot be connected and there is a mark to indicate the current connection object. If function block 1 is selected to input 1 of function block 6, then the input control will appear as “function block 6, input 1”.

Monitor values: Each function block has 3 input monitor values and 1 output monitor value, which will be refreshed in real time when it is started, and will be refreshed once when the refresh button is clicked. When there is an abnormality in the function block calculation, the monitor value will turn red, while black when it is normal.

Menu and id interaction:

When the input control is selected for other function block output id, the other function block input id is used as the input of the current function block, and it will synchronize the input menu of the current function block, and the output menu of the other function block will be updated synchronously.

The function block input id is used as the input for the current function block, the input menu and the output menu will be linked to update the display, and synchronize to modify the connection according to the selection.

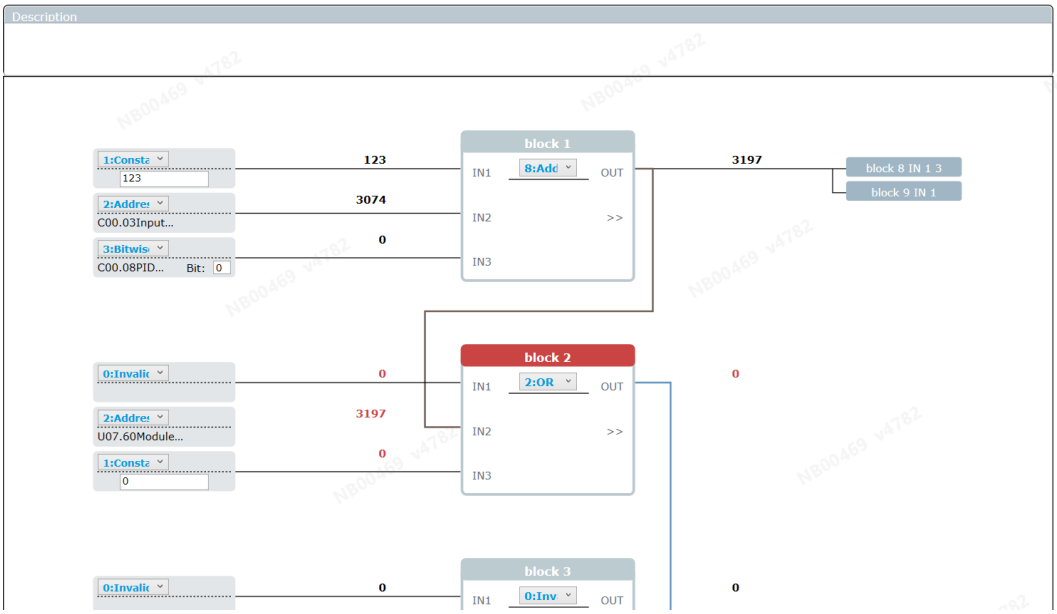


Figure 2-97 Programming Area

2.14.2 Module Status

Please refer to FBD Visual Programming Manual.

Chapter 3 Common Questions

3.1 “0x8*” in Log

Description

Log prompts "code: 0x83" or "code: 086", etc.

Cause

When reading and writing from the device, it reports error when a data frame is returned.

Solutions

Note:	Cause	Solutions
Command code error	03, 06 command error, which is not easy to appear	Contact the developer to check the command frame
CRC parity error	Error in CRC parity of the data frame, which is not easy to appear	Contact the developer to check the command frame
Illegal address	Address unrecognized	Check the excel table for an address error or there is no address in the device
Illegal data	Illegal written data	Check whether the data meets the parameter definition
Parameters cannot be changed during operation	The current parameter is modified during operation	Modify after shutdown
AC drive is busy	The device is currently not responding	Try again later
Parameter value above range	Parameter is above range	Check the parameters
Reserved parameters not modifiable	Parameter property is unmodifiable and is proceeded by the program. No need to handle it.	-
Read parameter byte error	Check frame length of the instruction frame	-

3.2 "Input String Format Incorrect” in Log

Description

"showReturnResult: The input string is not in the correct format” is prompted in the log.

Cause

The cell format of the default column of excel parameter table is required to be text (there is a small triangle in the upper right corner of the text cell), which does not actually take effect after being changed to text format (excel software bug).

Solutions

Set the cells of excel parameter table to text, fill in the numbers again, and a small triangle appears.

3.3 “scopeHis.xml” in Log

Description

It prompts that "Part of the path '.\ hisdata\ scopeHis.xml' could not be found."

Cause

The hisdata folder was missing in the old version.

Solutions

Create a new hisdata folder in the directory where the executable files are located, or use the latest version of the software.

3.4"value is too large or too small for Int32” in Log

Description

It prompts that "Value is too large or too small for Int32".

Cause

The value in the parameter table is inconsistent with the range and the number of decimal points. Please set the range after precision conversion.

Solutions

Check the value range of parameters, decimal point settings, if there are any problems, please contact the upper computer developers.

3.5 Incomplete Display of Parameters in the List

Description

It usually appears during group C switching, and the actual number of displayed parameters is inconsistent with the number of parameters in this group.

Cause

In the parameter, the data system is binary, and the type of corresponding parameter is set incorrectly.

Solutions

Category setting principle: 10*: binary low bit* is valid in positive sequence; 20*:binary low bit* is valid in reverse sequence. For example, 106 means binary positive sequence, taking the lower 6 as the parameter value, and 216 means binary reverse sequence, taking 16 as the parameter value.

3.6 Blank or Chinese Text

Description

When the host computer language is selected as foreign language, the text is displayed as empty or Chinese.

Cause

The corresponding parameter information or prompt language has not been translated.

Solution

Contact the upper computer developer to update the file.

3.7: Debugging Mode Start Failure

Description

The upper computer has been registered. After checking “Enable Debugging Mode”, enter the authorization code , and it prompts failure.

Cause

After the upper computer registers for access, it is generally valid for half a year. Or the registration tag file is deleted by mistake.

Solutions

Contact the authorized person and re-register.

3.8 Software Registered with Unsuccessful Authorization

Description

Enter the registration code in the upper computer, and it prompts that registration is successful. Check the debugging mode, input authorization code, but it prompts failure.

Cause

The upper computer registration authority is low or there is a problem in registration.

Solution

Contact the authorized person and re-register.

3.9 Empty Options for the Device

Description

When adding an offline device, and drop-down option is blank.

Cause

The device information file is opened.

Solution

Check if\datafile\ devices.xlsx is open and close the file. And reopen the Add Device page or restart the upper computer software.

3.10 Authorization Code Failure for Debugging

Description

After applying for debugging access and entering the authorization code, it prompts verification failure.

Cause

The authorization code is usually valid for half a year, so the authorization time might have expired, or the authorization mark has been deleted.

Solution

Contact the administrator who assigns the authorization to reassign a new one.

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