MYACTUATOR GUI2.1

DEBUGGING SOFTWARE MANUAL

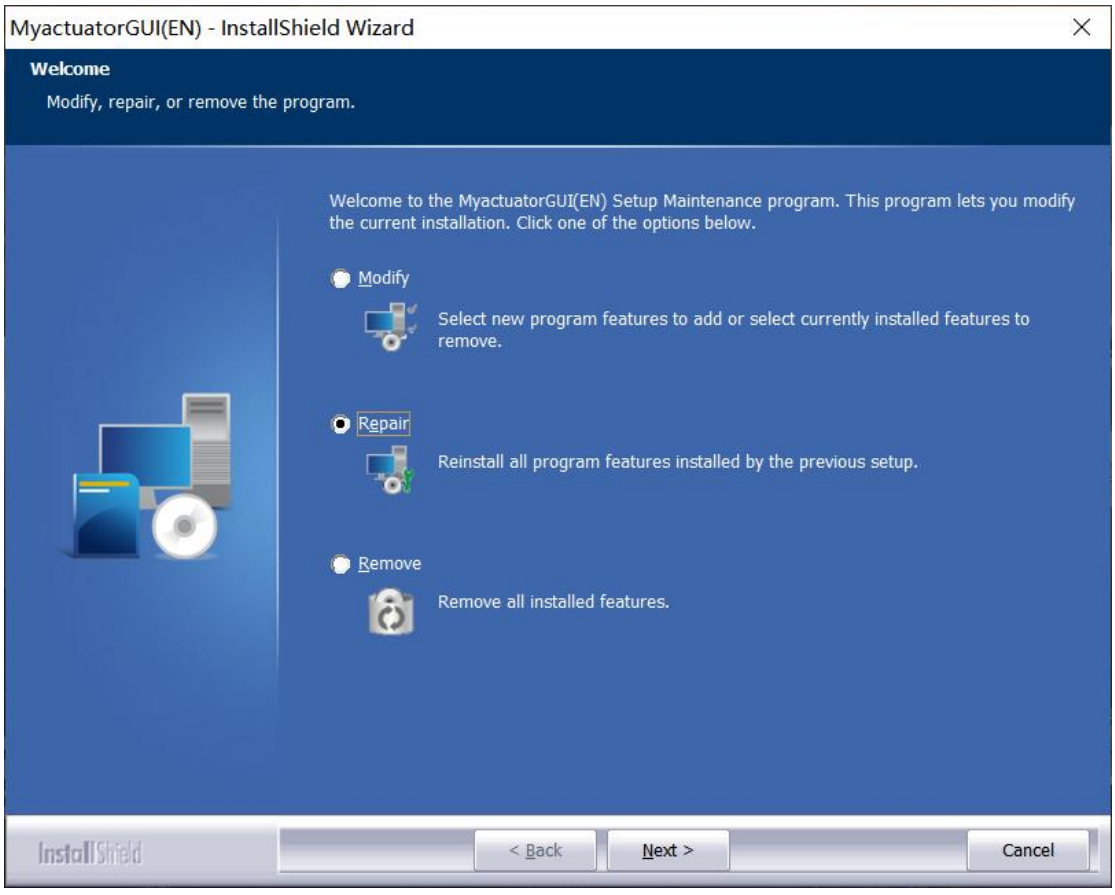
CATALOGUE

1. Software Installation and Motor Connection

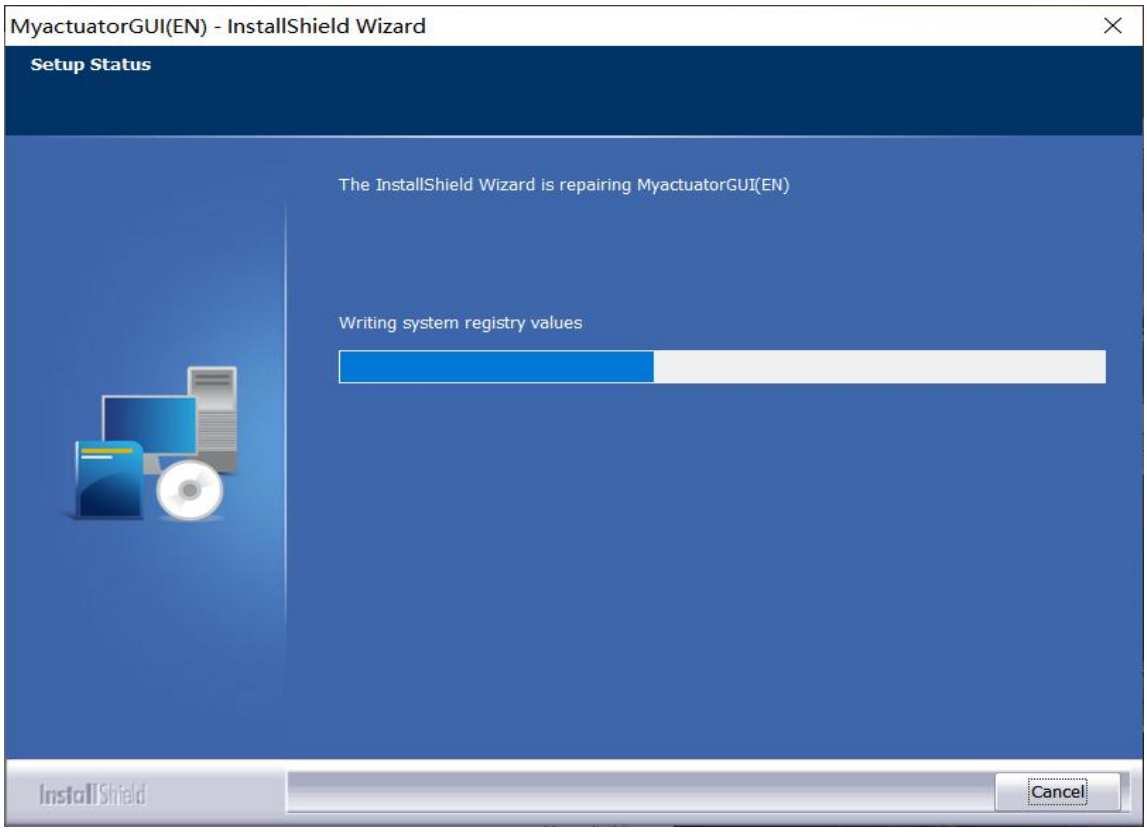
1.1 Software Installation

Click the program installation package “setup.exe” to install the software. The installation types are divided into "completely installation" and "custom installation". "Complete" type—— the software selects the default installation mode (including the installation path and program functions). “Custom” type——you can choose installation path. Please click "install" and wait for the software installation to complete.

Pic 1 Software installation package icon



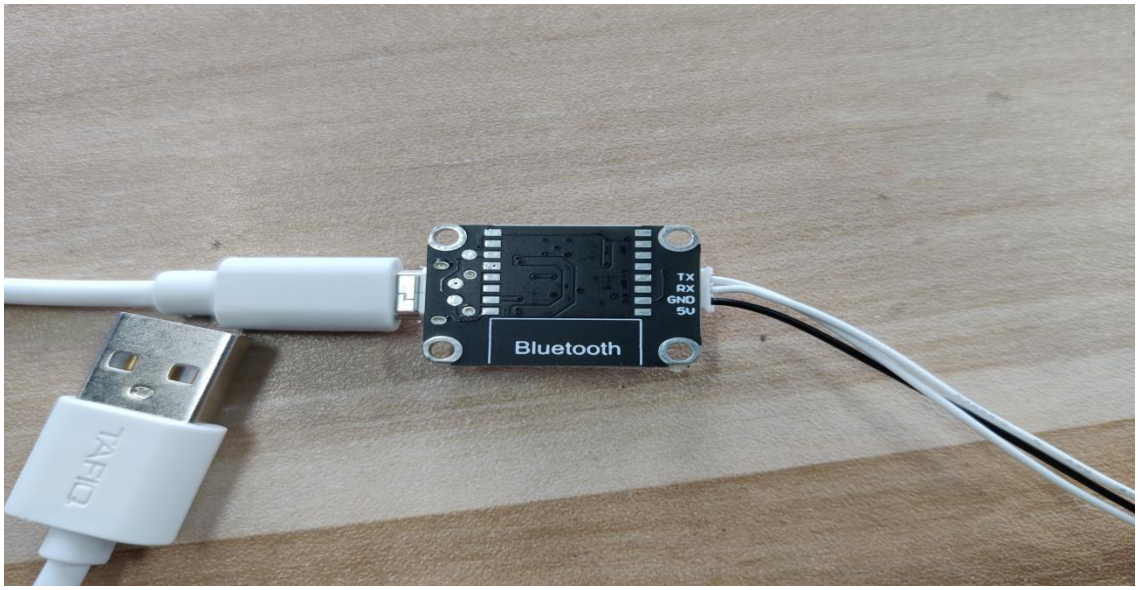
Pic 2 Software Installation Type



Pic 3 Software Installation

1.2 Motor Connection

RMD-X has designed a debugging interface (UART port), usually a USB to UART tool (as shown in the figure below) is needed to connect. Please install the driver of UART before use.

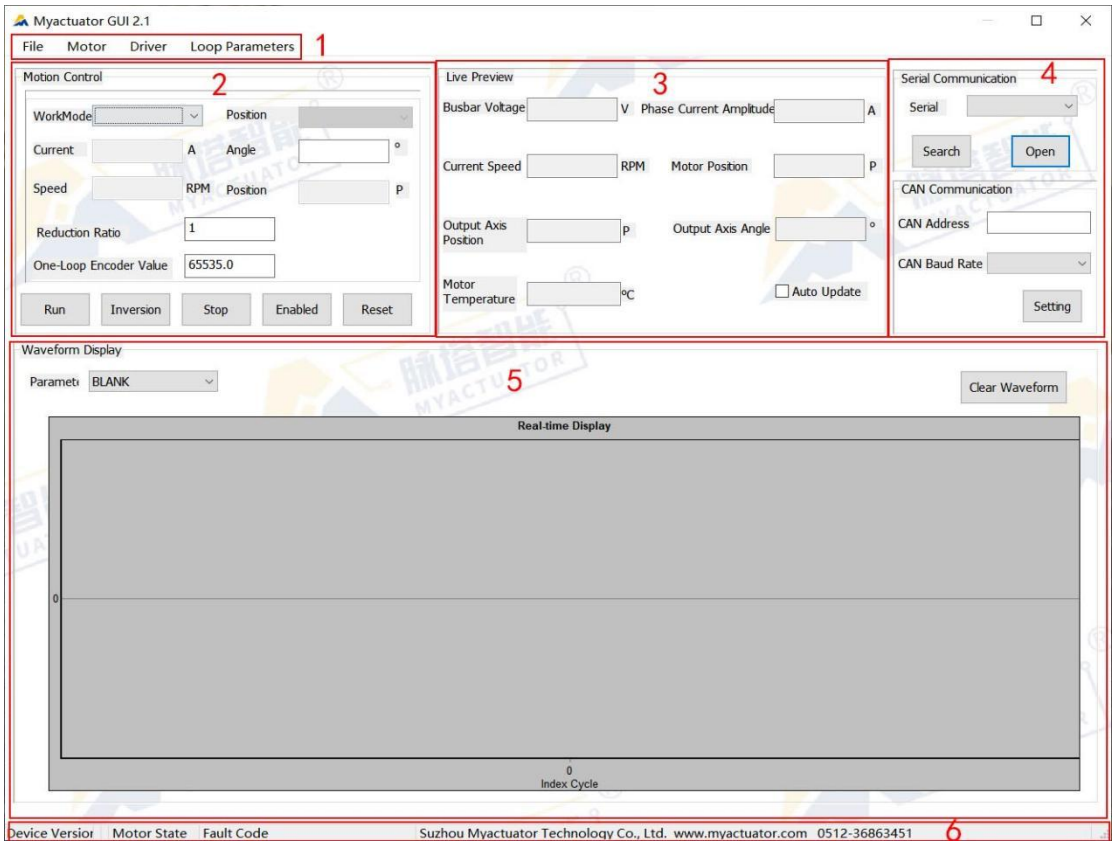


(Note: the wire need to connect to TX,RX,GND. MUST NOT to connect 5V)

1.3 Connect to PC

Adjust the voltage to a suitable voltage. Please turn off the power before connecting the motor. Connect as shown in the figure below:

2. Software Interface



Pic 4 Software interface

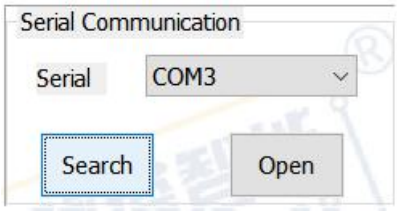
The main interface of the software is divided into six parts, which correspond to:
1 Menu bar: various functions of the software can be accessed through the menu bar.
2 Motion control: motion control of different working modes of the motor.
3 Real-time display: real-time display of each data of the motor.
4 Communication: Serial port connection driver, CAN address and baud rate setting;
5 Data display: real-time data waveform display of each data of the motor;
6 Status bar: display information such as the status of the drive and motor.

3 Main Interface Function Introduction

3.1 Serial Communication

RS232 communication is used between the drive and the computer. After connecting, turn on the power, click the "Search" button, select the correct serial COM port, click "Open", check the automatic update of the real-time display area, and observe that there is data to

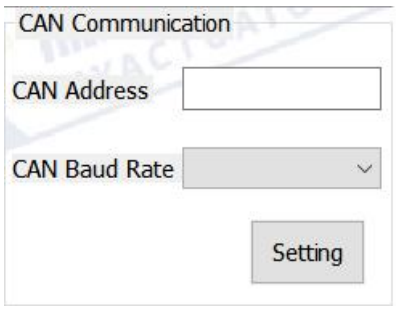
verify that the serial port is connected successfully .



Pic 5 Serial Communication

3.2 CAN Communication

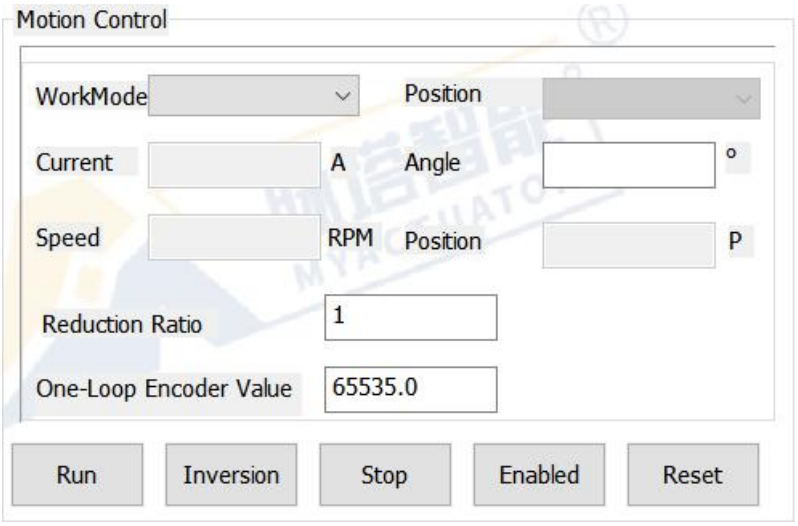
Enter the required CAN ID number in the CAN address, the ID starts from 140, select the appropriate CAN baud rate, and click "Set" to set the corresponding CAN ID of the drive.



Pic 6 CAN Communication

3.3 Motion Control

In the "Motion Control" area, click "Work Mode" to make the motor work in three modes: current loop, speed loop and position loop. Click "Enable", set the target current, speed or position value, click "Start", the drive will send the corresponding drive command; in the position mode, the data sent by the host computer is the "set position" value, which is set by the Determined by fixed angle, single-turn encoder value and reduction ratio.



Pic 7 Motion Control

3.3.1 Enable/Disable

Select "Work Mode", click "Enable", the motor enters the specified work mode, the "Enable" button changes to "Disable", click the "Disable" button to disable the motor.

3.3.2 Start/Reverse

After enabling, fill in the corresponding data according to different working modes, click the "start" button, the motor will move; click the "reverse" button, the motor will run in the opposite direction.

3.3.3 Stop Normally

When the motor is moving, click the "Normal Stop" button to stop the motor.

3.3.4 Reset

Click the "Reset" button to realize the functions of software resetting the chip and restarting the system.

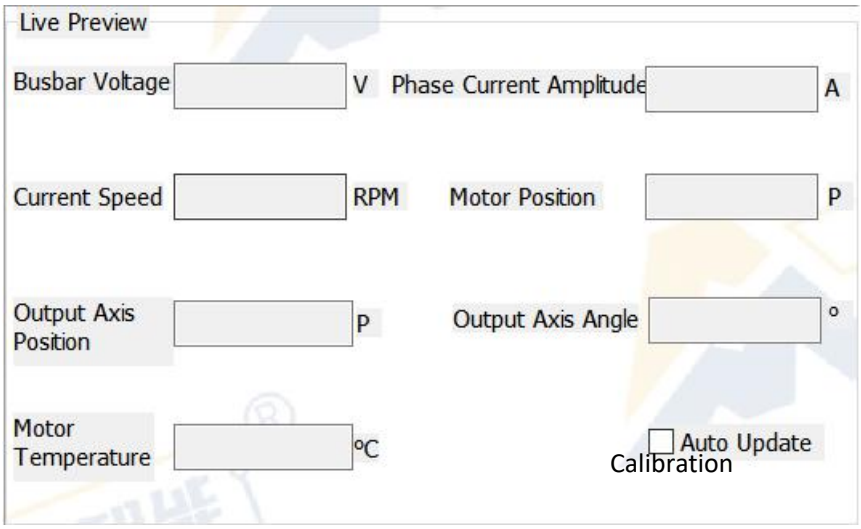
3.4 Real-time display

In the "real-time display" area, check the "automatic update" button to observe the current voltage, current, speed, temperature, position and angular position of the output shaft of

the motor, among which:
Output shaft position = motor position ÷ reduction ratio
Output shaft angle = motor position * 360 degrees ÷ (reduction ratio * single-turn encoder value)

3.4.1 Calibration

Click the "Calibrate" button to perform the position calibration function. After the calibration is completed, the input box will display the calibration result;
You need to stop the motor before calibration, and do not perform other operations during the calibration process; the "automatic update" function will be automatically canceled during calibration.



Pic 8 Real-time display

3.5 Waveform Display

In the "waveform display" area, you can choose to observe the real-time change curve of power supply voltage, phase current, current speed, motor position, output shaft position and angle; click the "clear waveform" button to redraw the waveform.

Pic 9 Waveform Display

3.6 Menu

The software menu bar contains the implementation of other functions of the software, including updating the modified parameters to the drive, saving the motor matching and related parameters, reading and writing driver parameters, reading and writing loop parameters, loop PID testing, and reading and writing customization parameters.

Pic 10 Menu Information

3.7 Status Bar

The software status bar displays the driver model, status, motor status, current fault value and other information.

Pic 11 Status bar information

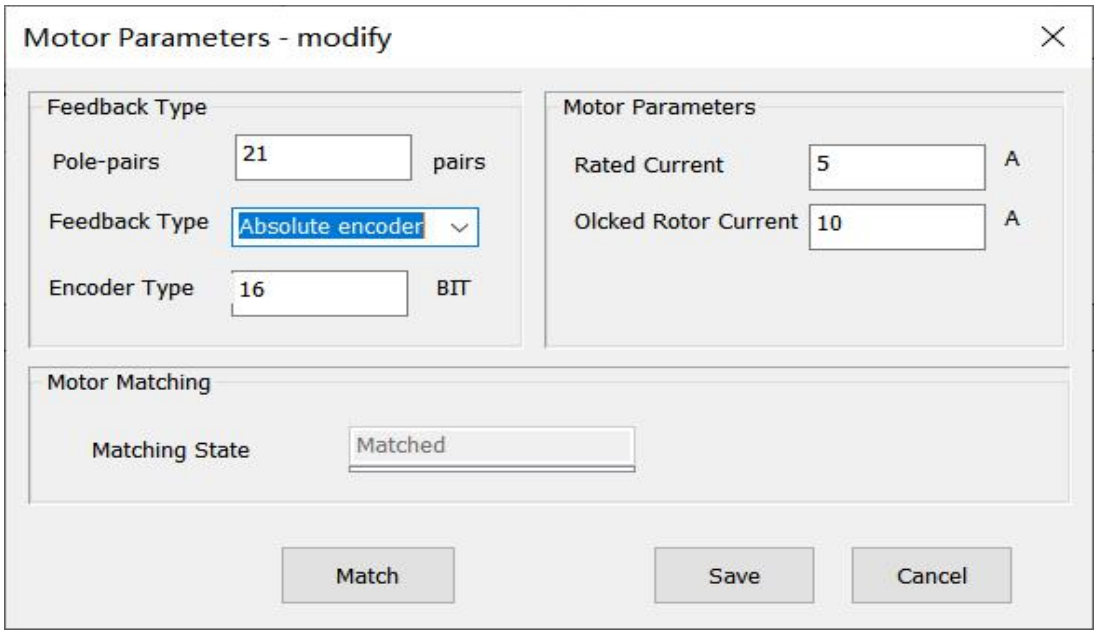
Chart 1 Fault List

Reference Value	Fault
0x0000	Non-Fault
0x0001	Hardware Over-current Reset
0x0002	Stall Error
0x0004	Under-voltage Error
0x0008	Over-voltage Error
0x0010	Motor over-current
0x0020	Reserve
0x0040	Power Input Over-current
0x0080	External battery Error
0x0100	Speeding Error
0x0200	Position overrun
0x0400	Internal Reference Voltage Error
0x0800	Internal Temperature Error
0x1000	Motor Temperature Error
0x2000	Encoder Calibration Error

4.Parameters Setting

4.1 Motor Parameter

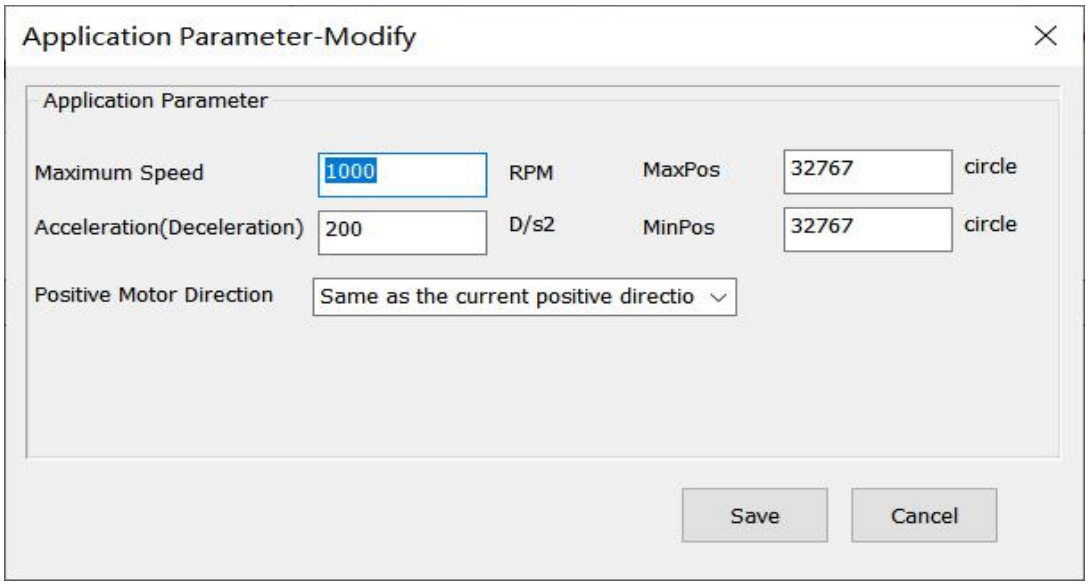
Click the "Motor" button in the menu bar, and the "Motor Parameters-Modify" interface appears. You can check whether the motor's rated current, rated speed, encoder pole pair number, and line number are correct. If there is any modification, click the "Save" button. After confirming that the motor parameters are correct, click "Start matching" and wait for the motor matching to be completed. The motor matching completion interface appears. Click "Close" to complete the motor matching.



Pic 12 Motor Matching

4.2 Driver Parameters

Click "Drive" in the menu bar to display the "Application Parameters-Modify" interface, in which you can modify the maximum speed, acceleration and deceleration of the drive, and enter the angle value in the "Maximum Position" and "Minimum Position" fields to give the motor Limit. After the modification is completed, click "Save", power off and restart, and the drive will use the new parameters.



Pic 13 Driver Parameter

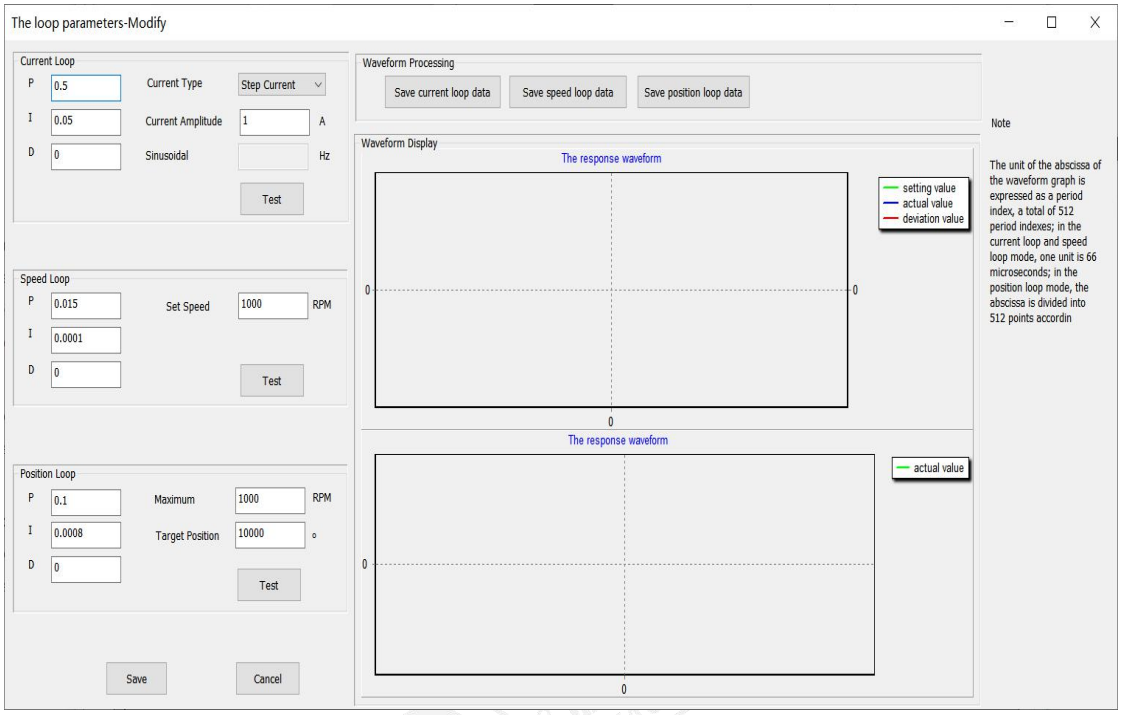
4.3 Loop Parameter

Click on the menu "Loop Parameters" to display the "Loop Parameters-Modify" interface, in which you can modify the PID parameters of the current loop, speed loop and position loop.

After the motor is enabled, the modified parameters can be tested in real time.

The waveform of the test data is displayed on the right; after the three closed-loop PID parameters are modified, click "Save", and then click "Download" in the menu bar "File" to update the modified parameters to the drive.

"Save current loop data", "Save speed loop data", "Save position loop data" can save the three loop test data to a local txt file.



Pic 14 Loop Parameter

5.Software Data Scope and Description

Motor Parameter			
	Minimum Value	Maxium Value	Unit
Encoder Wire	250	50000	Wire Number
Nominal Current	0.8	20	A
Stall Current	0.8	20	A
Number of Pole Pairs	0	40	Pair Number

Driver Parameter			
	Minimum Value	Maxium Value	Unit
Max Speed	0	2500	RPM
Acceleration/ deceleration	0	60000	D/S^2
Max Position	0	32767	Motor Turns
Min Position	0	32767	Motor Turns

Loop Parameter			
	Minimum Value	Maxium Value	Description
Current Loop P	0	5	Adjust the corresponding time, the larger the response , the shorter the response time, you can make appropriate adjustments under the default value.
Current Loop I	0	5	Adjust the static error, try to adjust it as small as possible within the range of the static error, and adjust appropriately under the default value.
Current Loop D	0	1	Not recommended under normal circumstances
Current Amplitude	0.8	Rated current set by motor parameters	

Speed Loop PID			
Speed Loop P	0	5	Adjust the corresponding time, the larger the response, the shorter the response time, you can make appropriate adjustments under the default value.
Speed Loop I	0	5	Adjust the static error, try to adjust it as small as possible within the range of the static error, and adjust appropriately under the default value.
Speed Loop D	0	5	Not recommended under normal circumstances
Speed Setting	0	Maximum speed set by drive parameters.	
Position Loop PID			
Position Loop P	0	2.5	Adjust the corresponding time, the larger the response, the shorter the response time, you can make appropriate adjustments under the default value.
Position Loop I	0	2.5	Adjust the static error, try to adjust it as small as possible within the range of the static error, and adjust appropriately under the default value.
Position Loop D	0	2.5	Not recommended under normal circumstances
Max speed	0	Maximum speed set by drive parameters.	
Target Position	The minimum position of the drive parameter setting*360(negative value)	The maximum position of the drive parameter setting*360	

Customization Parameter			
	Min Value	Max Value	Description
Brake start duty cycle parameters	0	3000	Adjust the output voltage of the control port when the brake is started.
Holding brake duty cycle parameters	0	3000	Adjust the output voltage of the control port when the brake is maintained.
Open loop matching current Iq	0	20	When the motor is matched, the open loop current is given.
Ultra low speed Vq setting.	0	1000	When the given speed is less than 20 revolutions, the constant Vq output is used, and the size can be set. Under the same Vq, different speeds are produced for different loads. 1000 represents 10V voltage

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