

iMotion Operational Manual

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Author: Document Department

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WEIHONG

1 Overview

iMotion is a commissioning software exclusively for WISE servo drives that is independently developed by Weihong Company. The software runs on Windows operating system, and communicates with the computer and servo drive via a USB cable. The software can be used for commissioning and control over the servo drive, including setting the parameters, monitoring running status, setting the servo motor, and trial running, and so on.

iMotion software can only be applicable to the following types of the servo drive:

- WISE WSDV series servo drive
- WISE WSDA series servo drive
- WISE multi-axis servo drive

Please use the manual together with reference of *WISE Servo Drive User's Manual*.

2 Install iMotion

Please note that **iMotion** software can only be applicable to WISE series servo drives that are developed by Weihong Company. It cannot be used for servo drives of other brands.

This section introduces how to install and initialize the software.

2.1 Requirements

Before installing **iMotion** software, make sure that your computer meets the following requirements:

| Items | Specifications |
|------------------------------|--|
| OS | Windows XP SP3 Chinese version(32 bit) |
| CPU | Pentium 4 1.0GHz or above |
| Memory | 512M or above |
| Hardware | 512M or above |
| Communication interface | USB 2.0 |
| Resolution of the display | 1024*768 or above |
| Color quality of the display | 24bpp (true color) or above |
| Installing environment | Windows Installer 3.1 or above |
| Running environment | .Net Framework 4.0 or above |

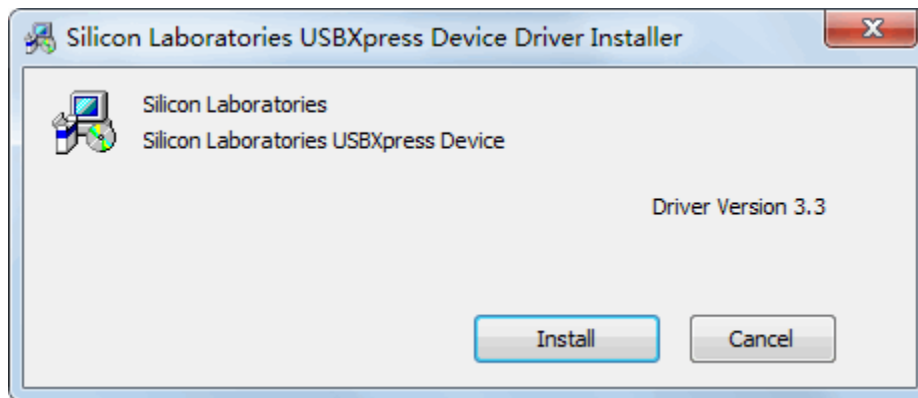
iMotion software cannot be applied to several displays.

2.2 Procedure

If any version of **iMotion** software has been installed on the computer, please remove it first.

To install **iMotion** software, please do the following:

1. In the installation package, double click on **Setup.exe** to start installation. Do as the guidance.
2. During installation process, a driver is required for the communication between the computer and the servo drive via USB, as shown in the following figure. Click **Install** to start installing the device driver.



3. After installation of the driver finishes, click **Close**. Installation of **iMotion** software finishes.

After installation, you can find the shortcut of the software and start the software in the following ways:

- on the desktop
- in the “Start” menu

2.3 Switch Software Configuration

At present, **iMotion** software includes two applications:

- Single-axis application, where one WISE servo drive is used together with one servo motor, and controls the movement of one machine axis.
- Multi-axis application, where one WISE servo drive is used together with four servo motors, and controls the movement of four machine axes.

Start the **iMotion** software, and do the following to switch between two applications:

1. Click **Other > Change Software** to open a **Open** dialog box.
2. Find the corresponding exe application and open it.

Default directory of the exe application: C:\Program Files\Weihong\iMotion\.

After changing the software configuration, a dialog box for communication setup pops out.

If there is no further explanation, this manual takes **iMotion** multi-axis application as an example to introduce functions and tasks. Refer to the actual software interfaces for **iMotion** single-axis application.


2.4 Set the Communication

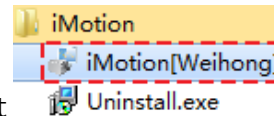
After you start the software, the first thing you need to do is to establish the communication among the computer, the software and the servo drive.

To set the communication, do the following:

1. Do one of the following to start **iMotion** software:

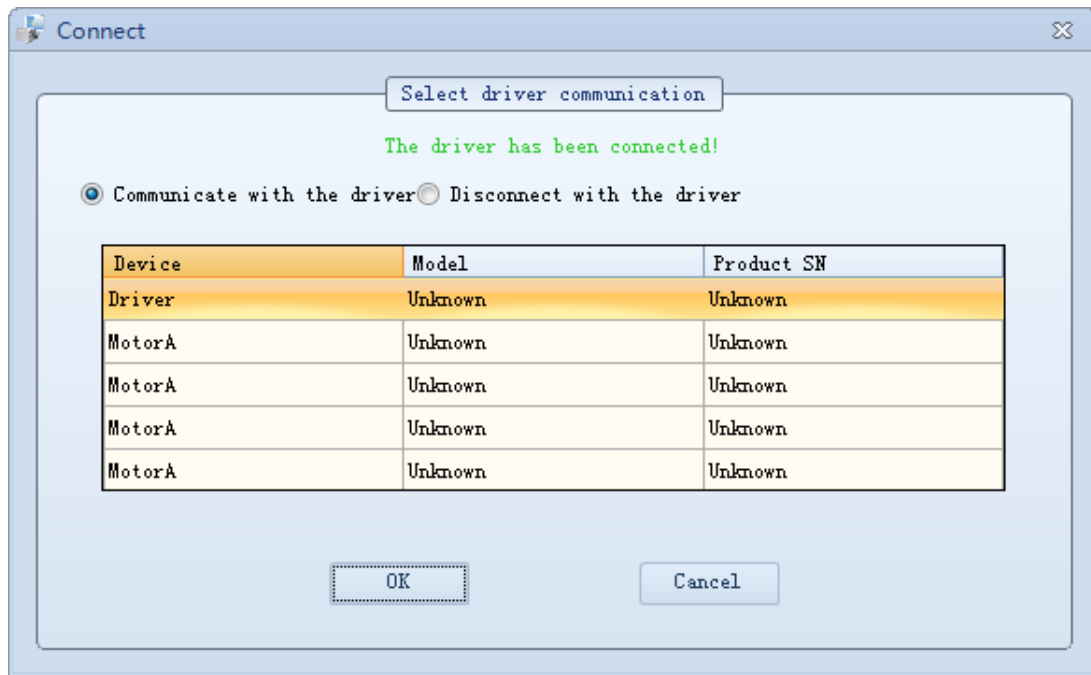


- Double click the shortcut  on the desktop.

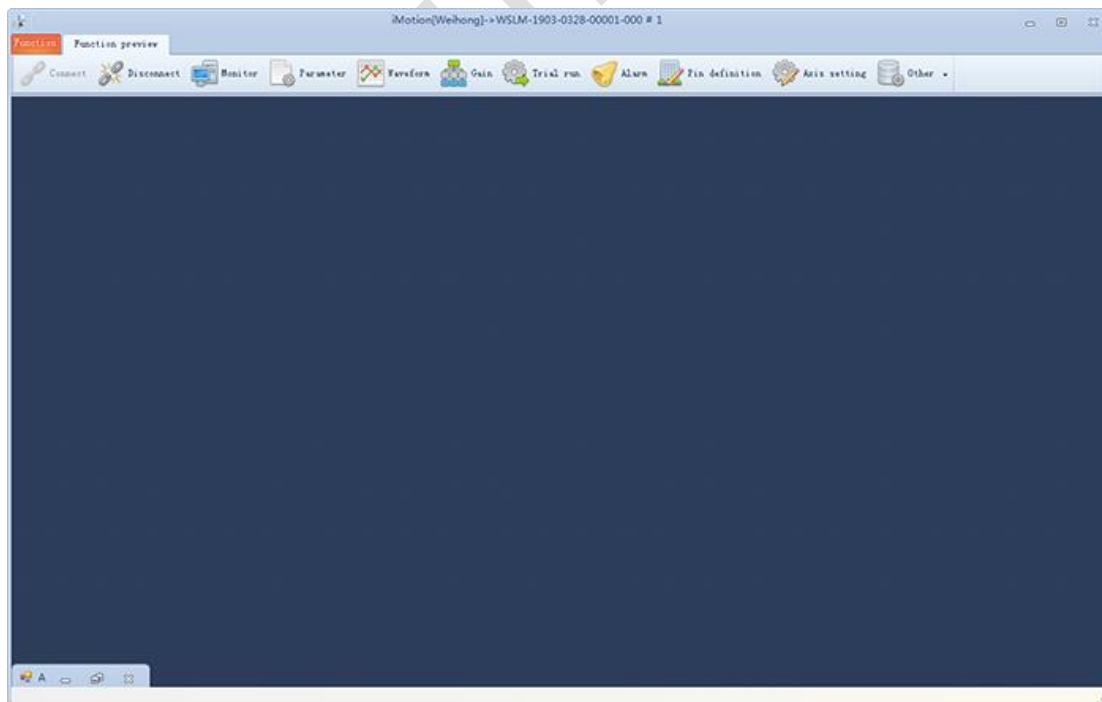


- In **Start** → **All programs** menu, click the shortcut .

- After the software is started, a communication setup dialog box pops out. The software automatically searches the servo drives that have been well connected with the computer. Click **OK** to confirm the connection.



After **iMotion** software is well connected with the servo drive, see the main interface as follows:



NOTE: If you select “Not communicate with the servo drive”, only parameters, waveform loading and help can be used. Other functions are available in this condition.

2.5 Switch Language

At present, **iMotion** software supports Simplified Chinese, Traditional Chinese, and English, which can be freely switched in the software.

To switch the software language, please do the following:

1. Click **Other** → **Select Lang**, to open a dialog box named **Language Selection**.
2. Select the target language and click **OK**.
3. Confirm your choice and restart the software.

Target language takes effect after you start the software again.

3 Monitor Servo Drive Running Status

In **Monitor** window, you can obtain and check information such as running state of the servo drive or the motor, I/O signals, internal status, and so on.

Because the servo drive and the computer are connected via USB, displaying values in **Monitor** window and on the front panel of the drive may be slight different because of error or time delay. In addition, the monitor is not kind of measuring device, and the displaying values can only be used for estimation.

According to the function, the monitor consists of the following:

- [Input Signal Status Monitor](#)
- [Output Signal Status Monitor](#)
- [Drive Status Monitor](#)
- [Encoder and Grating Ruler Monitor](#)
- [Electrical Level Monitor](#)
- [Analog Input Monitor](#)

For the single-axis software and multi-axis software, monitoring items are different. Please pay much attention to the difference.

3.1 Single-axis Software

If it is **iMotion** software of single-axis, click **Monitor** to open the window, as shown below:

Sampling interval : 1S Start Stop

Monitor

| Physical input | | | Logic input | | |
|--|-----|-------|-------------|--|--|
| Input signal | Pin | Token | | | |
| General-purpose input | 15 | GP | | | |
| Positive direction overtravel inhibition input | 43 | POT | | | |
| Negative direction overtravel inhibition input | 14 | NOT | | | |
| Homing deceleration limit switch | 13 | DEC | | | |
| External latch signal input 1 | 29 | EXT1 | | | |
| External latch signal input 2 | 30 | EXT2 | | | |

| Analog input | Value | Unit |
|----------------------|-------|------|
| Analog input volt... | 0 | V |
| Analog input volt... | 0 | V |

| Driver | | |
|----------------------------|-------|--------------|
| Internal status | Value | Unit |
| Position command deviation | 0 | Command unit |
| Actual speed | 0 | r/min |
| Torque command | 0 | % |
| Overload rate | 0 | % |
| Over-regenerative rate | 0 | % |

| Physical output | | | Logic output | | |
|-----------------------------------|-----|----------|--------------|--|--|
| Logic signal | No. | Token | | | |
| Invalid | 1 | INVALID | | | |
| Servo alarm output | 2 | ALM | | | |
| Servo ready output | 3 | S-REDY | | | |
| External brake release signal | 4 | BRK-OFF | | | |
| Positioning complete | 5 | INF | | | |
| At-speed output | 6 | AT-SPEED | | | |
| Torque in-limit signal output | 7 | TLC | | | |
| Zero-speed clamp detection signal | 8 | ZSP | | | |
| Velocity coincidence | 9 | V-DTIN | | | |

| Encoder/Grating ruler | | |
|-----------------------|---------|--------------|
| Encoder/Grating ruler | Value | Unit |
| Data after one... | 1048576 | Encoder unit |
| Multi-turn data | 0 | Rotate |

| Pin No. | High/Low count |
|-----------|----------------|
| 43 (POT) | 0 |
| 13 (DEC) | 1 |
| 29 (EXT1) | 1 |

Legend: 43 (POT) — 13 (DEC) — 29 (EXT1)

3.1.1 Input Signal Status Monitor

| Physical input | | |
|--|-----|-------|
| Input signal | Pin | Token |
| General-purpose input | 15 | GP |
| Positive direction overtravel inhibition input | 43 | POT |
| Negative direction overtravel inhibition input | 14 | NOT |
| Homing deceleration limit switch | 13 | DEC |
| External latch signal input 1 | 29 | EXT1 |
| External latch signal input 2 | 30 | EXT2 |

| Logic input | | |
|--|-----|---------|
| Logic signal | No. | Token |
| Invalid | 1 | INVALID |
| Positive direction overtravel inhibition input | 2 | POT |
| Negative direction overtravel inhibition input | 3 | NOT |
| Servo-ON input | 4 | SRV-ON |
| Alarm clear | 5 | A-CLR |
| Control mode switching input | 6 | C-MODE |
| Gain switching input | 7 | GAIN |
| Deviation counter clear input | 8 | CL |

- Physical input: Send status of the input signal to the servo drive.
 - Red background: connects to COM.
 - Pink background: connects to Open.
- Logic input: It represents internal signal status of the servo drive.
 - Red background: active.
 - Pink background: inactive.

3.1.2 Output Signal Status Monitor

| Physical output | | |
|-------------------------------|-------|---------|
| Output signal | Pin | Token |
| Servo alarm output | 4/19 | ALM |
| External brake release signal | 3/18 | BRK-OFF |
| Positioning complete | 34/33 | INP |
| Zero-speed detection signal | 2/17 | ZSP |

Force output

| Logic output | | |
|-----------------------------------|-----|----------|
| Logic signal | No. | Token |
| Invalid | 1 | INVALID |
| Servo alarm output | 2 | ALM |
| Servo ready output | 3 | S-RDY |
| External brake release signal | 4 | BRK-OFF |
| Positioning complete | 5 | INP |
| At-speed output | 6 | AT-SPEED |
| Torque in-limit signal output | 7 | TLC |
| Zero-speed clamp detection signal | 8 | ZSP |
| Velocity coincidence output | 9 | V-COIN |

- Physical output: Signals fed out from the servo drive.
 - Red background: the output transistor is ON.
 - Pink background: the output transistor is OFF.
 - Force output: with the button is clicked, displaying of the front panel of the servo drive will be fixed to the current output signal status.
 - Force canceled: click the button to restart the servo drive to exit the monitoring state.
- Logic output: status of the internal status of the servo drive.
 - Red background: active.
 - Pink background: inactive.

3.1.3 Drive Status Monitor

Monitor the running status of the servo drive, the motor, and the encoder.

| Internal status | Value | Unit |
|----------------------------|-------|--------------|
| Position command deviation | 0 | Command unit |
| Actual speed | 0 | r/min |
| Torque command | 0 | % |
| Overload rate | 0 | % |
| Over-regenerative rate | 0 | % |

| Pulse sum | Value | Unit |
|-----------------|-------|--------------|
| Command pul sum | 0 | Command unit |
| Encoder pul sum | 0 | Encoder unit |

| Status | No. | Description |
|--------|------|-----------------------|
| Error | 21.0 | Encoder communication |

Position command deviation

It refers to the positional deviation of specified position and feedback position(command unit).

Actual speed

It refers to actual speed of the motor.

Torque command

It refers to the currently active torque command.

Overload rate

It refers to actual overload factor of the motor (the value should not exceed 100% when adjusting the motor).

Over-regenerative rate

It refers to the level rate when over-regenerative protection alarm occurs. Note that at this time, over-regenerative rate shown on the monitor is not equal to the regenerative energy.

Power voltage

It refers to the voltage across P-N of the servo drive.

Encoder position deviation

It refers to the positional deviation of specified position and feedback position (encoder unit).

Pulse sum

It shows the sum of command pulse received by the encoder and the encoder pulse sum.

Status

It shows error or alarm information of the encoder.

3.1.4 Encoder and Grating Ruler Monitor

Monitor the status of the encoder and grating ruler.

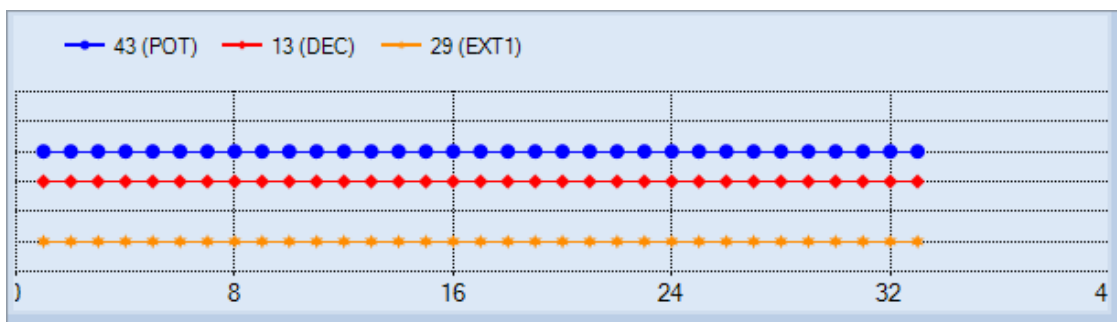
3.1.5 Electrical Level Monitor

Monitor the electrical level of the input signals and output signals. If the input signal or output signal has not been specified, the system will monitor the default signals when **Monitoring** window opens.

To set the electrical level of the input signals and output signals that are under monitoring, please do the following:

1. Click **Stop**.
2. In the column of **Pin Definition**, select the input signals or output signals to be monitored.
3. Set **Sampling Interval**.
4. Click **Start**.

The system will automatically do the sampling to the target input signals or output signals, according to the sampling interval. Electrical level changing of the signals will be displayed, as shown below:



3.1.6 Analog Input Monitor

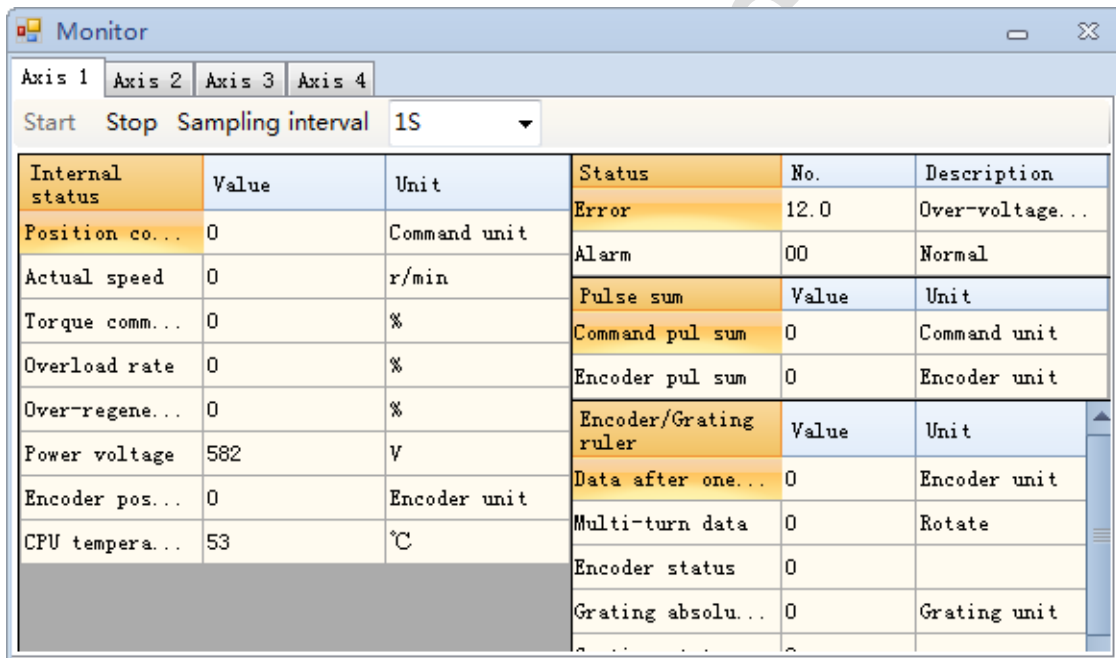
Show the real-time changing of analog input voltage.

| Analog input | Value | Unit |
|----------------------|-------|------|
| Analog input volt... | 0 | V |
| Analog input volt... | 0 | V |

NOTE: For M2 bus type servo drive, there is no input signal status monitor.

3.2 Multi-axis Software

If it is **iMotion** software of multi-axis, click **Monitor** to open the window, as shown below:



To access monitoring items of different axis, click the tab.

Compared with single-axis software, monitoring items in the multi-axis software are simplified, including:

- [Monitor of the Servo Drive, the Motor, and the Encoder](#)
- [Encoder and Grating Ruler Monitor](#)

4 Parameter Operations (In Case of Single-axis)




In **iMotion** software, you can edit or manage parameters of the servo drive. This section introduces interfaces and relevant operations that are related with parameters in **iMotion** of Multi-axis configuration. Please pay attention to the difference between of Multi-axis and Single-axis.

According to the function, parameters of the servo drive can be divided into the following categories:

- [Class 0] Basic Setting
- [Class 1] Gain Adjustment
- [Class 2] Damping Control
- [Class 3] Velocity/Torque Control
- [Class 4] I/F Monitor Setting
- [Class 5] Enhancing Setting
- [Class 6] Special Setting
- [Class 7] Custom Motor Setting

For more details and setting requirements about each parameter, please refer to *Chapter Parameter* in *WISE Servo Drive User Manual*.

Regarding effective time and attributes of the parameters, different kinds of parameters are indicated by the background color in **iMotion** software, as the following:

- : Modifications to the parameters take effect immediately. If you need to save the parameter settings, execute **Write to EEPROM** after modifications.
- : Modifications to the parameters take effect after restarting the servo drive. If you need to save the parameter settings, execute **Write to EEPROM** and then restart the servo drive after modification.
- : This kind of parameters are read-only, which cannot be modified.

4.1 Load Parameter Settings

Select a batch of parameters and load them into **iMotion**. Then you can directly modify the parameters or do other operations to the parameters in **iMotion**.

There are three ways to load the parameter settings, including the following:

- Loading from the servo drive

Once **iMotion** is well connected with the servo drive, **iMotion** directly reads parameter settings from the servo drive. Modifications to the parameter in **iMotion** will be directly shown in the servo drive.

- Loading from the file

iMotion reads parameter settings from an external files. Modifications to the parameter in **iMotion** can only be sent to the servo drive by firstly clicking **Send**.

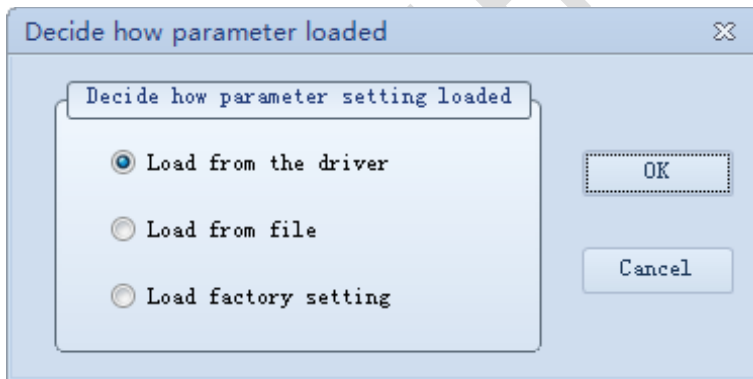
- Loading the default settings
 - If **iMotion** is not connected with the servo drive, default parameter settings of the servo drive when will be loaded.
 - If **iMotion** has been connected with the servo drive, parameter settings in initialization area of the servo drive will be loaded.
 - Modification to the parameter in **iMotion** software can only be sent to the servo drive by firstly clicking **Send**.

Parameter settings in initialization area of the servo drive refers to the parameter setting after executing **Restore**. For different brands of the servo drive, default settings may be different.

If the version of **iMotion** is too old, item “Loading factory settings” means loading parameter setting of default settings when the software is installed, instead of the parameter setting in the initialization area of the servo drive.

To load the parameter settings, please do the following:

1. Click **Parameter** to open the dialog box named **Select Parameter Loading Method**, as shown below:

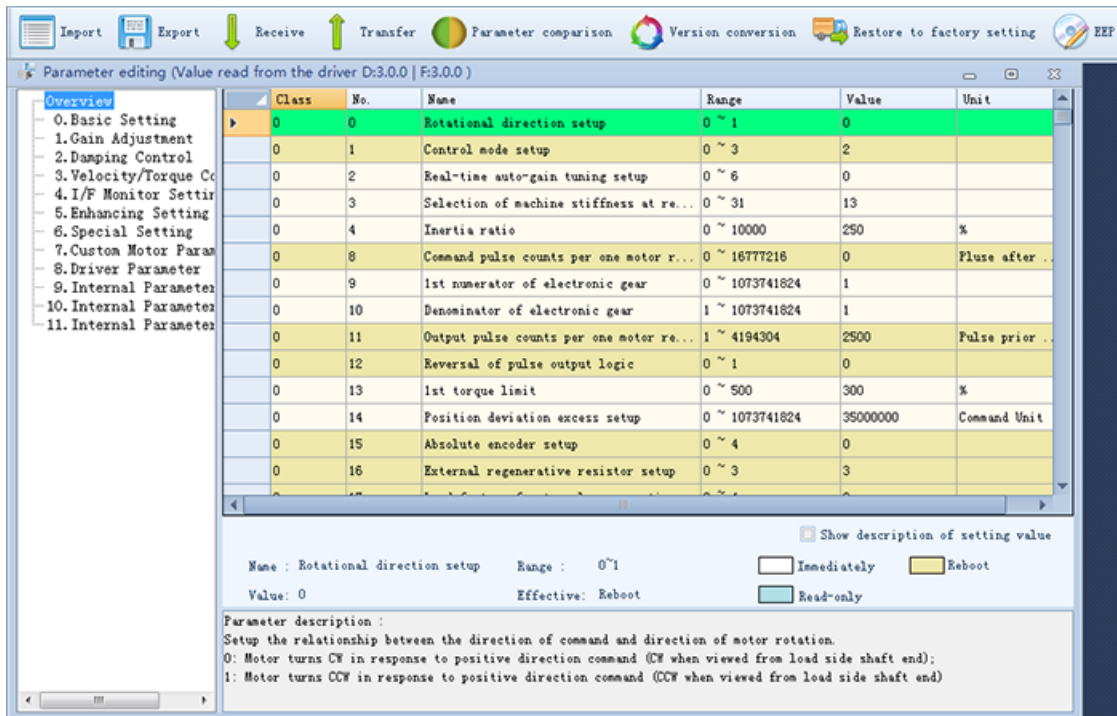


2. Select how to load the parameter settings.
3. Click **OK**.

4.2 Modify Parameter Settings

After parameters is loaded, you can view all parameters and modify them in **iMotion**.

Parameter editing window is as shown below:



To modify the parameter setting, please do the following:

1. In the parameter list, find the target parameter.
2. Double click on the **Value** column, and enter the value.
3. Click Enter to confirm the modification.
4. Click **EEP**. Modification will be written into EEPROM of the servo drive.
5. **Optional:** For a parameter of “Reboot”, to which the modification takes effect after restarting the servo drive.

If the modification to a parameter is not written into EEPROM, a prompt dialog box will pop out when you close the **Parameter** window. At this time, you can also execute the operation of **Write EEPROM**.

During the process of writing into EEPROM, do not power off the servo drive. Otherwise, it may cause failure.

4.3 Other Parameter Operation

This part introduces other frequently used parameter operations. You need to check the machine axis first.

- Import and Export

Import: Import parameter settings into **iMotion** from an external file. The parameter file is formatted in `.pm` by default.

Export: Export the current parameter settings in **iMotion** into an external file. The parameter file is formatted in `.pm` by default.

- Send and Receive

Send: Send parameter settings from **iMotion** into the servo drive.

Receive: Receive parameter settings from the servo drive, and load it to **iMotion**.

NOTE: In case of loading parameters from an external file, or loading the factory settings in **iMotion**, modifications to the parameters in **iMotion** will not be sent to the servo drive. You need to click **Send** to synchronize the parameter values in **iMotion** software and the servo drive.

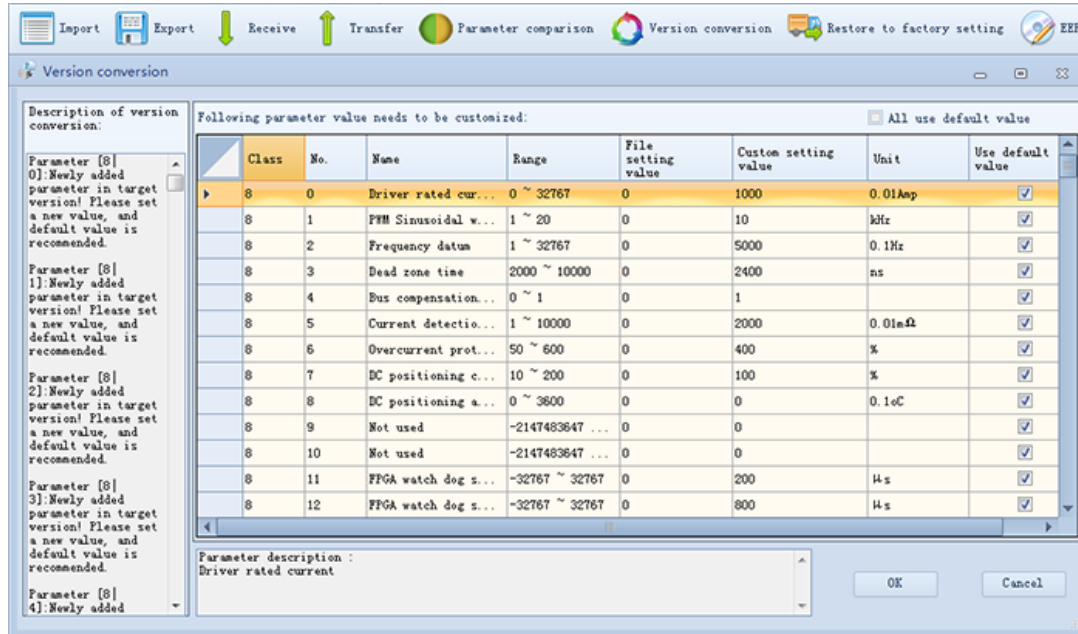
NOTE: If the parameter has been change in neither **Trial Run**, **Pin Definition**, or **Gain** windows, the parameter value that is shown on the interface may be different from its actual value in the servo drive. At this time, click **Receive** to read the actual value in the servo drive.

- Version Conversion (Only available in **iMotion** of single-axis application)

When loading parameter settings from an external file in **iMotion** software, if the file does not match with the current version of **iMotion**, you can use **Version Conversion** to make it compatible. After conversion, parameter settings can only be shown in **iMotion**, instead of being saved to the file. If you need to save the conversion result to the parameter file, please do the **Export**.

To use version conversion, please do the following:

1. In **Parameter** window, click **Version Conversion** to open the dialog box named **Version Conversion**, as shown below:



2. Confirm the following information of the parameter.
 - Name, Range, Unit: It means the name, setting range and unit of the parameter in converted version.
 - File Default: It means the default value of the parameter after conversion.
 - Custom Default: It means the default value that is defined by the users.
 - Preset: It means the default parameter value after conversion.

If the box in front of **Use Default** is checked, values in the column of "Custom Default" will be the default values for corresponding parameters in the converted version, and they cannot be changed. Check the box in front of **All Use Preset**, all parameters will use the preset values.

3. Click **Confirm** to execute the version conversion.
4. Click **Send** to send the modifications to the servo drive.

Compared with the parameter file that has been loaded:

- If there is any new parameter in the target version, the parameter will directly be added with the default value. There will also be a prompt asking for setting a new parameter value.
- If there is any parameter that is absent in the target version, the parameter will directly be deleted.

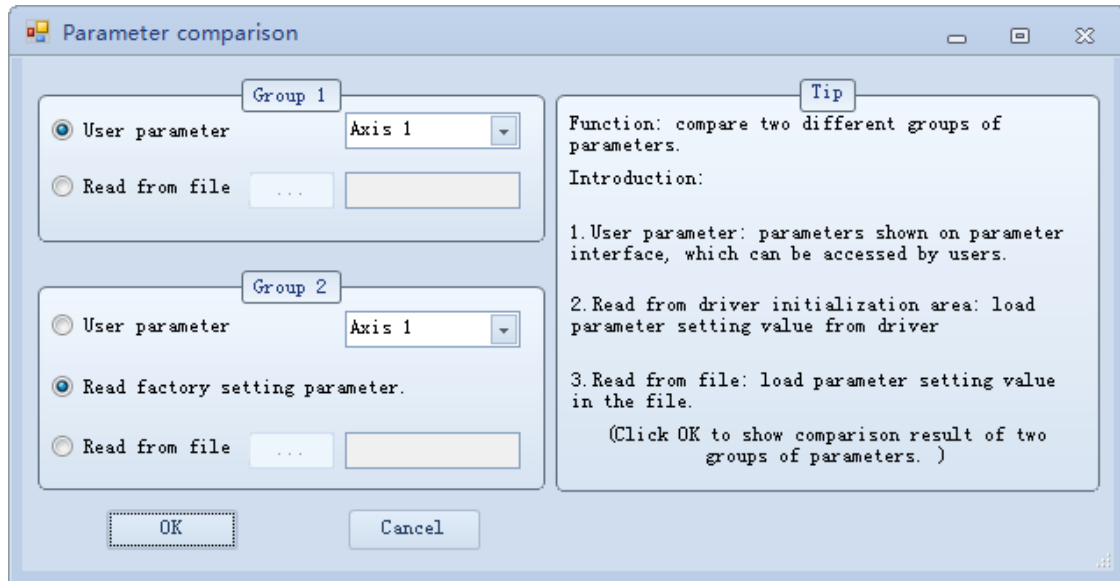
After the conversion, if the parameter value in the loaded file exceeds the value in the target version, there will be prompt asking for setting a new parameter value.

- Parameter Comparison

Compare two versions of parameter files.

To compare two parameter files, please do the following:

1. In **Parameter** window, click **Compare Parameter** to open the dialog box named **Parameter Comparison**, as shown below:

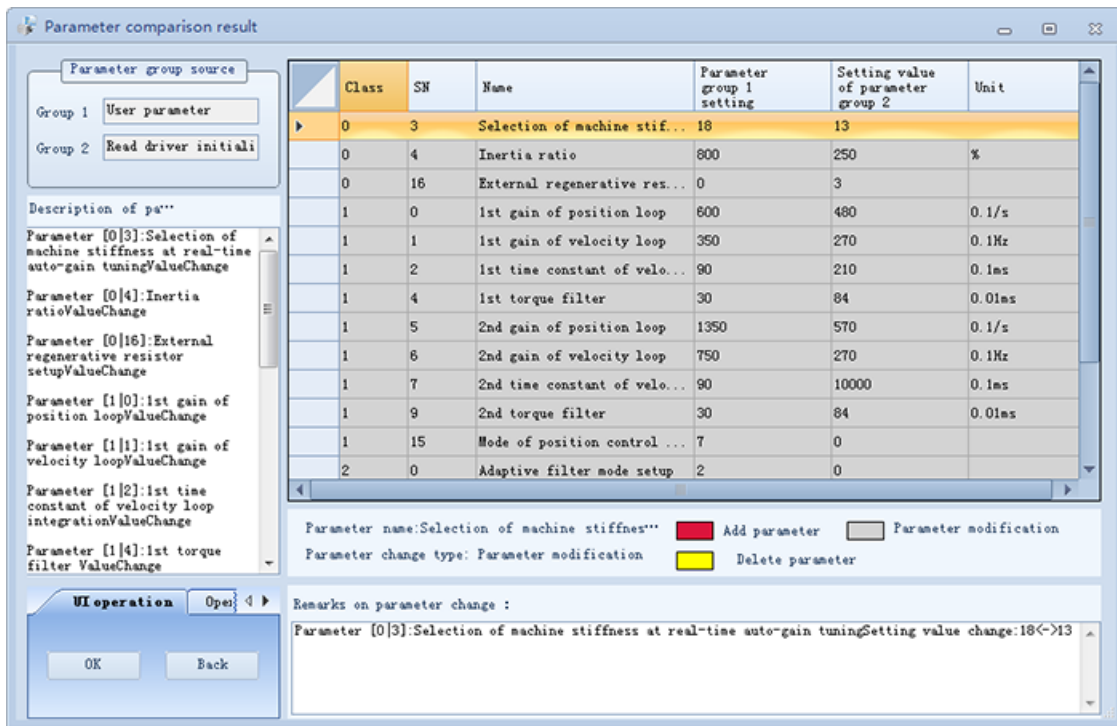


2. Select one of the following types of the parameters that are to be loaded for “Group 1” and “Group 2”.
 - Loading users’ parameters: loading parameters in the list of **Parameter Editing** window in **iMotion** software. These type of parameters are edited by the users.
 - Loading from the file: loading parameters from an external .pm file.
 - Loading from the initialization area of the servo drive: loading parameters from the initialization area of the servo drive.

NOTE: If the version of **iMotion** software is too old, function of “Read factory setting parameter” is invalid, because it cannot read the parameter setting from initialization area of the servo drive.

3. Click **OK**.

After making parameters comparison, the result interface is as shown below:



Among which:

: Compared with Group 2, parameters that have been added in Group 1.

: Compared with Group 2, parameters that have been deleted in Group 1.

: Compared with Group 2, parameters that have been changed in Group 1.

- Restore

Restore settings of all parameters in the servo drive to the default values. You need to restart the servo drive to make them effective.

5 Parameter Operations (In Case of Multi-axis)




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- [Class 6] Special Setting

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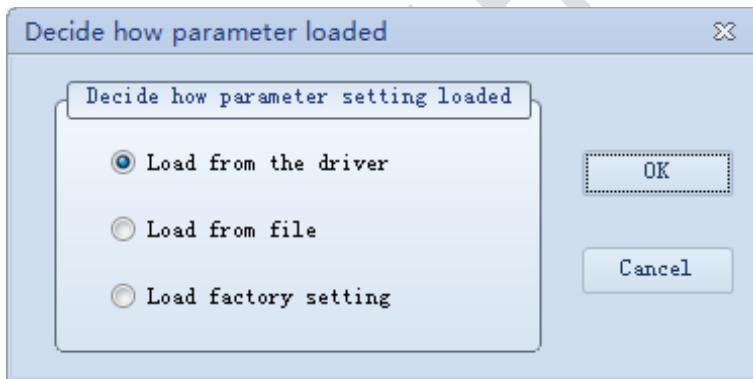
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 - If **iMotion** has been connected with the servo drive, parameter settings in initialization area of the servo drive will be loaded.
 - Modification to the parameter in **iMotion** software can only be sent to the servo drive by firstly clicking **Send**.

Parameter settings in initialization area of the servo drive refers to the parameter setting after executing **Restore**. For different brands of the servo drive, default settings may be different.

If the version of **iMotion** is too old, item “Loading factory settings” means loading parameter setting of default settings when the software is installed, instead of the parameter setting in the initialization area of the servo drive.

To load the parameter settings, please do the following:

1. Click **Parameter** to open the dialog box named **Select Parameter Loading Method**, as shown below:

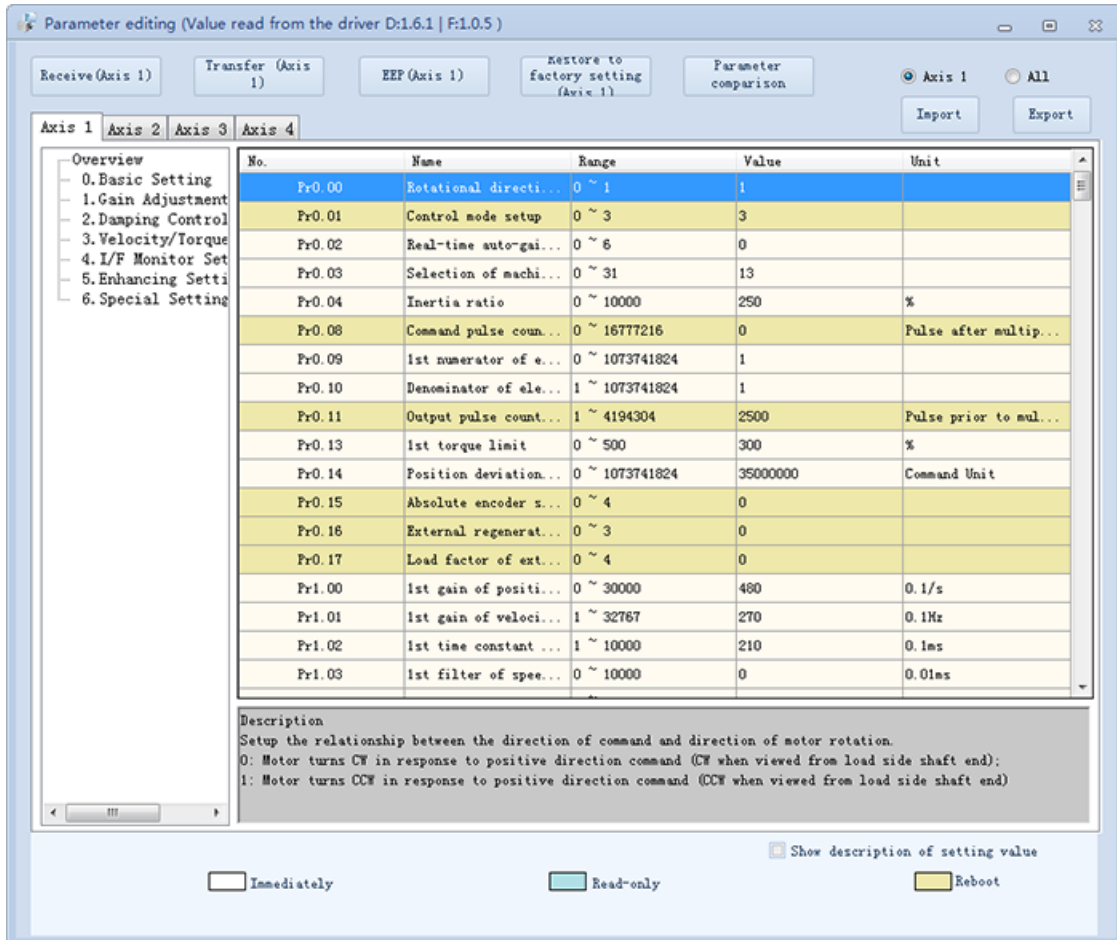


2. Select how to load the parameter settings.
3. Click **OK**.

5.2 Modify Parameter Settings

After parameters is loaded, you can view all parameters and modify them in **iMotion**.

Parameter editing window is as shown below:



To modify the parameter setting, please do the following:

1. Switch the axis tab to select the target axis.
Once the target axis is selected, texts on buttons including **EEP**, **Restore**, **Send**, and axis buttons will be updated.
2. In the left parameter list, select the target parameter group, and find the target parameter in the right list.
3. Double click on the **Value** column, and enter the value.
4. Click Enter to confirm the modification.
5. Click **EEP**. Modification will be written into EEPROM of the servo drive.
6. **Optional:** For a parameter of "Reboot", to which the modification takes effect after restarting the servo drive.

If the modification to a parameter is not written into EEPROM, a prompt dialog box will pop out when you close the **Parameter** window. At this time, you can also execute the operation of **Write EEPROM**.

During the process of writing into EEPROM, do not power off the servo drive. Otherwise, it may cause failure.

5.3 Other Parameter Operation

This part introduces other frequently used parameter operations. You need to check the machine axis first.

- Import and Export

Import: Import parameter settings into **iMotion** from an external file. The parameter file is formatted in `.pm` by default.

Export: Export the current parameter settings in **iMotion** into an external file. The parameter file is formatted in `.pm` by default.

- Send and Receive

Send: Send parameter settings from **iMotion** into the servo drive.

Receive: Receive parameter settings from the servo drive, and load it to **iMotion**.

NOTE: In case of loading parameters from an external file, or loading the factory settings in **iMotion**, modifications to the parameters in **iMotion** will not be sent to the servo drive. You need to click **Send** to synchronize the parameter values in **iMotion** software and the servo drive.

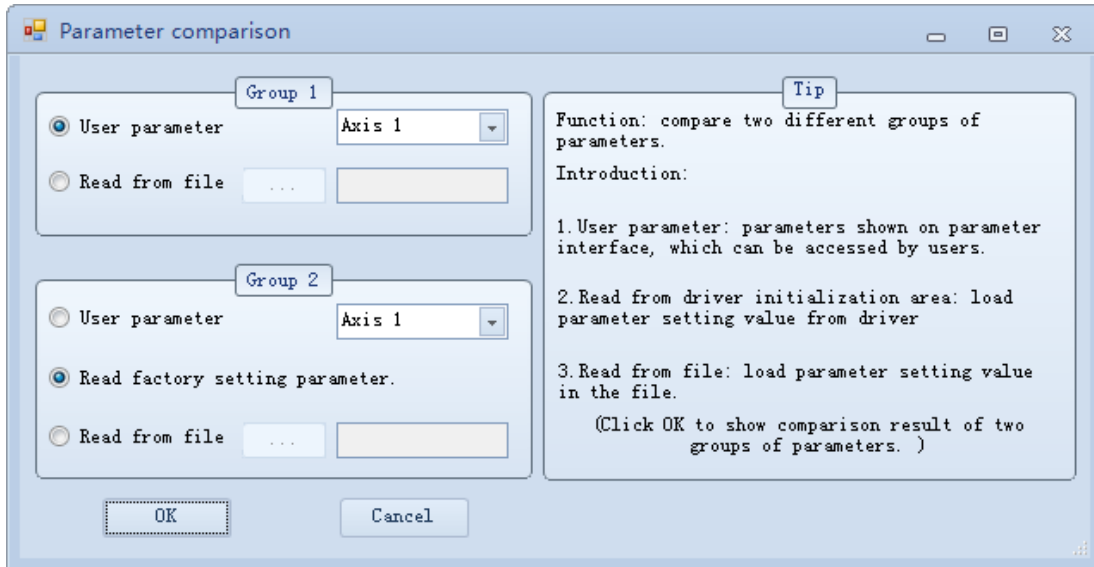
NOTE: If the parameter has been change in neither **Trial Run**, **Pin Definition**, or **Gain** windows, the parameter value that is shown on the interface may be different from its actual value in the servo drive. At this time, click **Receive** to read the actual value in the servo drive.

- Parameter Comparison

Compare two versions of parameter files.

To compare two parameter files, please do the following:

1. In **Parameter** window, click **Compare Parameter** to open the dialog box named **Parameter Comparison**, as shown below:

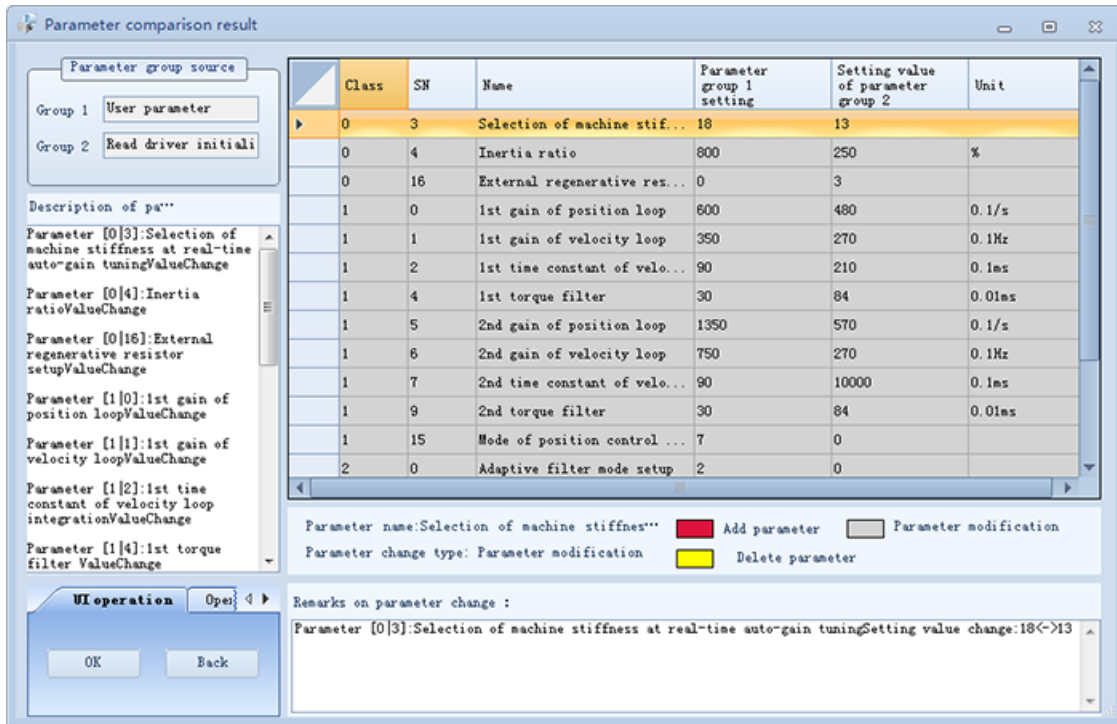


2. Select one of the following types of the parameters that are to be loaded for "Group 1" and "Group 2".
 - Loading users' parameters: Loading parameters in the list of **Parameter Editing** window in **iMotion** software. These type of parameters are edited by the users.
 - Loading from the file: Loading parameters from an external .pm file.
 - Loading from the initialization area of the servo drive: Loading parameters from the initialization area of the servo drive.

NOTE: If the version of **iMotion** software is too old, function of "Read factory setting parameter" is invalid, because it cannot read the parameter setting from initialization area of the servo drive.

3. Click **OK**.

After making parameters comparison, the result interface is as shown below:



Among which:

: Compared with Group 2, parameters that have been added in Group 1.

: Compared with Group 2, parameters that have been deleted in Group 1.

: Compared with Group 2, parameters that have been changed in Group 1.

- Restore

Restore settings of all parameters in the servo drive to the default values. You need to restart the servo drive to make them effective.

6 Waveform Acquisition

iMotion provides the function of waveform acquisition, including monitoring the data of waveform, calling the data that has been saved. Waveform can show the following data:

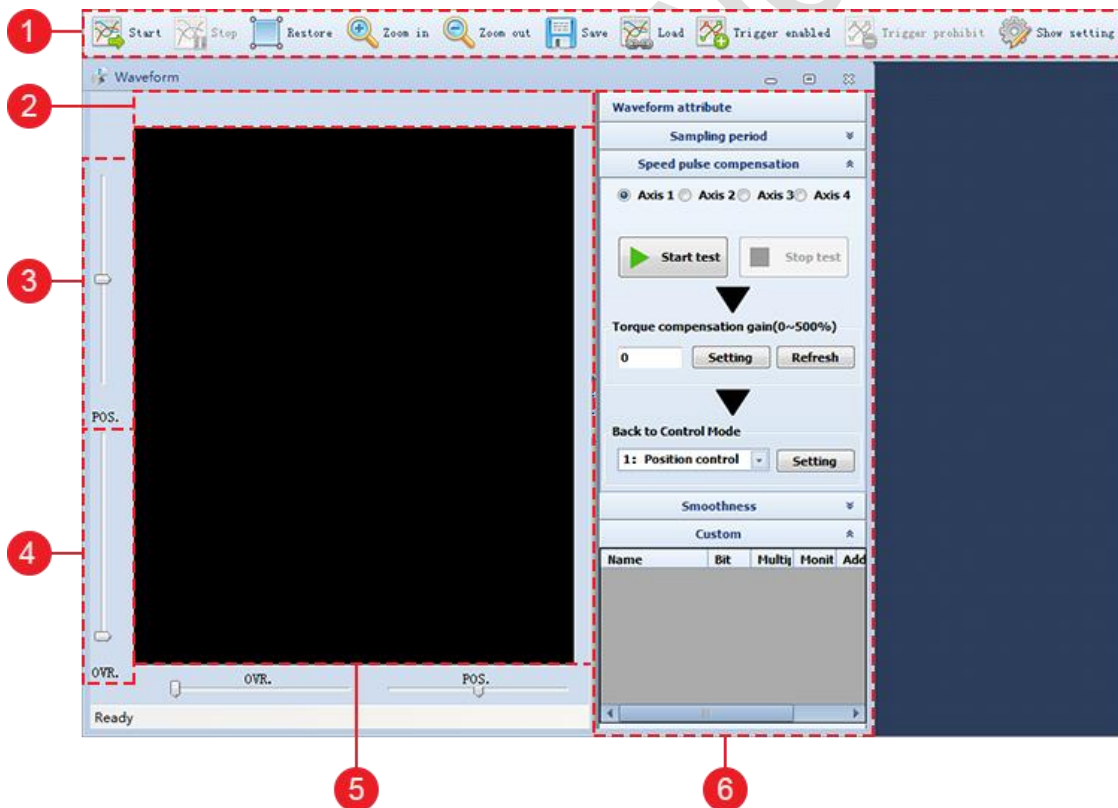
- Commands that have been sent by the servo motor.
- Actions of the servo motor, including speeds, torque command, deviation pulses.

6.1 Waveform Window

In the **Waveform** window, you can do the following:

- View the test results of the motor actions.
- Save the waveform to a file.
- Read waveform data from an external file.

Click **Waveform** to open the window, as shown below:



1. Toolbar: It contains icons for setting or operating on the waveform. Icons include the following:
 - **Start**: starts waveform collection by collecting the data of motor actions.
 - **Stop**: stops waveform collection.
 - **Restore**: restores the waveform curve to the original view.
 - **Zoom In**: magnifies the waveform curve.
 - **Zoom Out**: shrinks the waveform curve.
 - **Save**: saves the waveform that has been collected to a file.
 - **Load**: loads and shows the waveform from an external file.
 - **Trigger enabled**: sets triggering condition for waveform collection, that is, collecting the waveform with certain restrictions.
 - **Trigger prohibit**: sets prohibition condition for waveform collection, that is, collecting the waveform without any restriction.
 - **Show setting**: sets colors for waveform curves.
2. Name of the current waveform.
3. Slide for the position adjustment.
 - Horizontal: shows the curves at different point of time.
 - Vertical: shows the curves at different range of data.
4. Slide for the override adjustment.
 - Horizontal: magnifies or shrinks the curves in horizontal direction.
 - Vertical: magnifies or shrinks the curves in vertical direction.
5. Displaying area of the waveform.
6. Attribute area of the waveform.

In **Trigger enabled** and **Trigger prohibit**, attributes of the waveform are shown in different ways.

- Sampling period: the time interval between two adjacent sampling points in waveform acquisition.
- Custom:
- Smoothness: sets the smoothness of the curve to remove burrs from the curve. After adjustment, the waveform looks more smoother without changing the actual waveform data.
- Custom: selects the items that you want to monitor.

6.2 Collect Waveform with Trigger Prohibit

It means to collect the waveform without any condition.

To collect the waveform without any condition, please do the following:

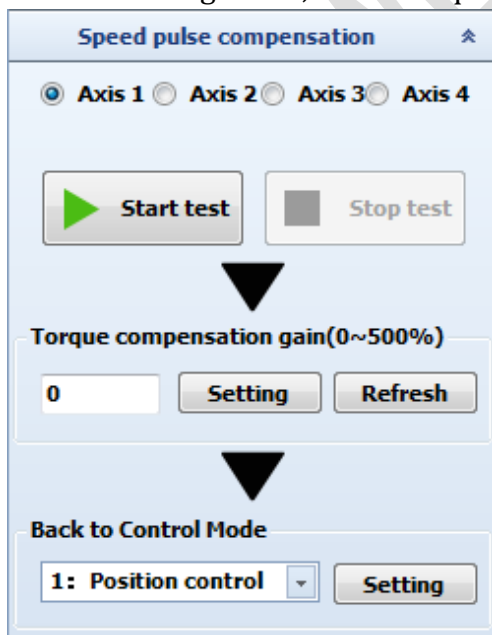
1. In **Waveform** window, click **Trigger prohibit**.
2. In attribute setting area, set the sampling period, and select the items to be monitored.

NOTE: Bit sum of the monitored objects should not exceed 64.
3. **Optional:** If you need to test the oscillation of motor cogging, make a speed pulse compensation.
4. Click **Start**. The system starts to collect the waveform.

Click **Stop** to stop collecting the waveform. Once the waveform is collected, you can further operate on or adjust the waveform.

If you need to test the oscillation of motor cogging, please make a speed pulse compensation before collecting the waveform.

1. Check the setting of parameter Pr001, and make sure the parameter is set to 0. Modification to this parameter takes effect after restarting the servo drive.
2. Click **Start**.
3. In the input box of **Torque compensation gain**, enter the compensation value, and click **Set**.
4. If you are satisfied with the testing result, please set ; if you are satisfied with the testing result, set de torque compensation and try again.



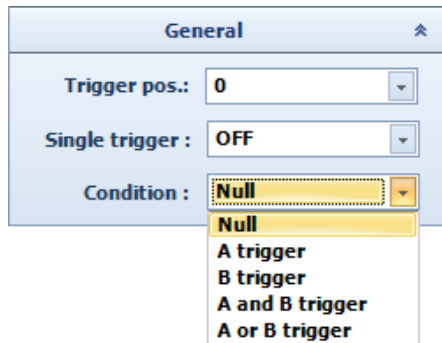
NOTE: In single-axis iMotion, axis selection buttons are absent.

6.3 Collect Waveform with Trigger Enable

It means to collect the waveform under certain condition. The servo drive will firstly judge the triggering condition. Only the triggering condition is met, the waveform can be shown. And after a certain time, it will automatically stop collecting the waveform.

To use the conditional waveform collection, please do the following:

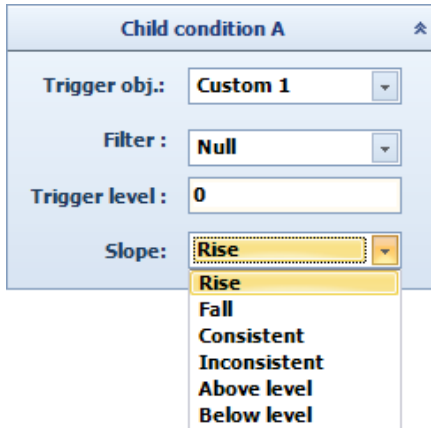
1. In waveform window, click **Trigger Enable**.
2. In ***General*** attribute area, set the triggering condition.



- Triggering position: At the moment that the triggering condition is met, horizontal coordinates of the waveform will be shown.
- Single trigger: ON represents triggering once and OFF represents continuous triggering before the **Stop** button is clicked.
- Triggering condition: The condition for starting the waveform collection.
 - No trigger: no triggering condition for collecting the waveform. See [Collect Waveform with Trigger Prohibit](#).
 - Child condition A: once Condition A is met, it starts to collect the waveform. You need to further set the Condition A.
 - Child condition B: once Condition B is met, it starts to collect the waveform. You need to further set the Condition B.
 - Child condition A and B: only both Condition A and Condition B are met, it starts to collect the waveform. You need to further set Condition A and Condition B.
 - Child condition A or B: either Condition A or Condition B is met, it starts to collect the waveform. You need to further set Condition A and Condition B.

- After triggering condition is defined, set the child condition.

Taking **Child condition A** as an example:



- Trigger object: Once the condition is met, start to collecting the waveform.
 - Trigger level: Once the trigger object reaches the value, start to show the waveform curves.
 - Slope: How to decide the triggering level for the object.
- In attribute area, set the sampling period, and select the objects to be monitored.
NOTE: Bit sum of all objects that have been monitored should not exceed 64.
 - Click **Start** to start collecting the waveform.

Click **Stop** to immediately stop collecting the waveform. And you can operate on the waveform that has been collected, such as shrinking, magnifying, smoothing, etc.

7 Gain Tuning

To ensure the servo motor timely and exactly do what as the upper control system tells, and maximize the machine utility, the users can use **Gain Tuning** to adjust the servo drive.

In **iMotion** software, there are two ways of gain tuning, including:

- [Real-time auto gain tuning](#)
- [Vibration resistance](#)

Before adjust the gain of the servo drive, carefully read *WISE Servo Drive User Manual* first for related Chapters of “Gain Tuning”.

Before open **Gain Tuning** window, you need to close the following windows first:

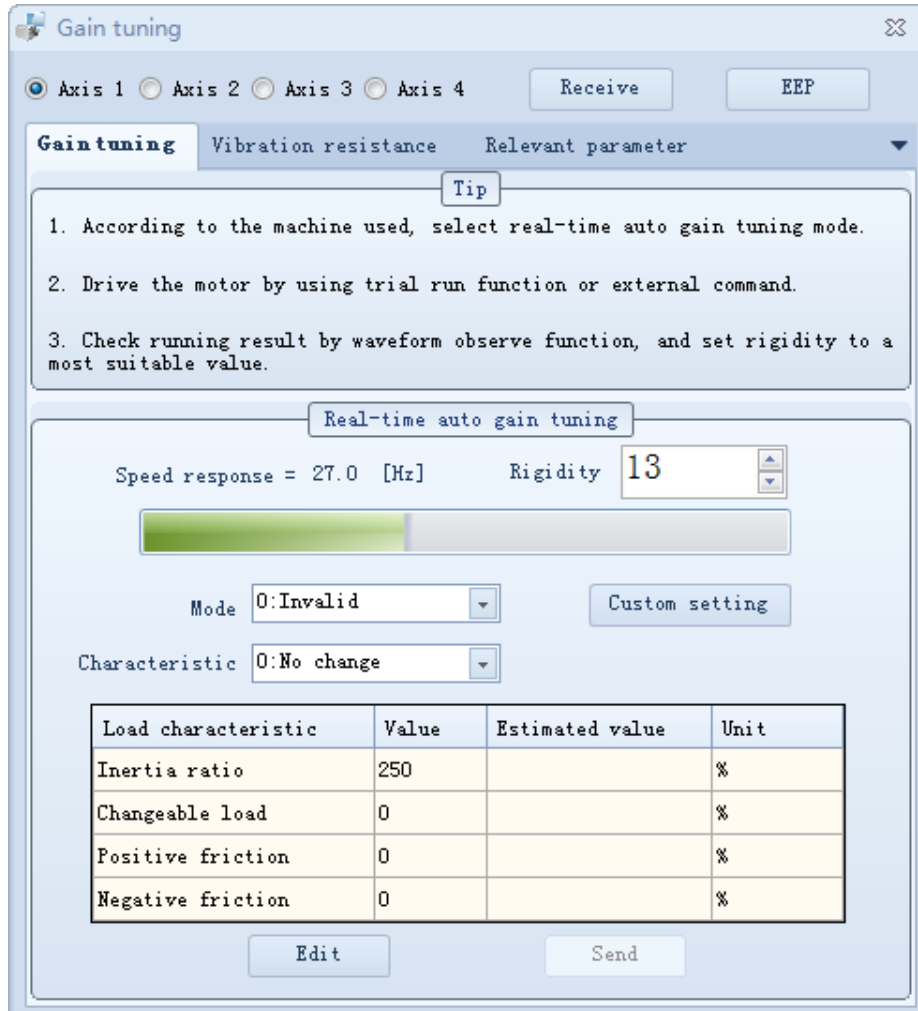
- **Parameter** window
- **Pin Allocation** window

7.1 Real-time Auto Gain Tuning

According to the running status of the machine to execute real-time gain tuning.

Please do the following:

1. Click **Gain** to open **Gain Tuning** window, as shown below:



2. Set **Mode Selection** and **Characteristics**.

For automatic inertia estimation, generally **Mode Selection** is recommended to set to 1, and **Characteristics** to 0.

3. **Optional:** If you want to manually set the inertia ratio, changeable load, positive friction and negative friction, please do the following:
 - a. Click **Edit**.
 - b. Enter the value in the column **Value**.
 - c. Click **Send**.

NOTE: Once **Characteristics** is set, you can directly run the motor without manually set items in the column **Characteristics**.

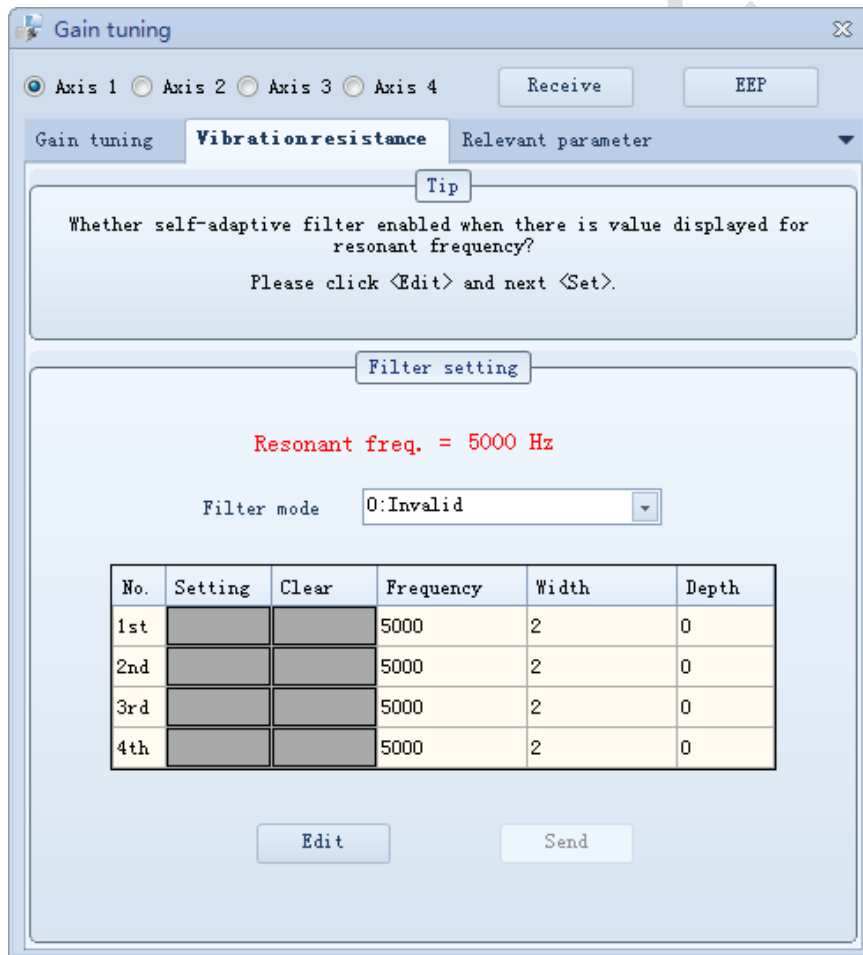
4. Click **Trial Run** or use external commands to run the motor.
5. Click **Waveform**. Observe the contact ratio of waveforms in **Waveform** window, and adjust the value of rigidity to make waveform contact closely.

7.2 Vibration Resistance

When the machine rigidity is relative low, resonance because of axis deviation or distortion may cause vibration and noise. In this case, the gain cannot be set too high. At this time, the user can use notch filter to resist the resonance. That is, with the notch filter, the user can set a higher gain or resist the vibration.

To execute the vibration resistance, do the followings:

1. Click **Gain** → **Vibration Resistance** to open the dialog box named **Vibration Resistance**, as shown below:



2. Set the **Filter mode**.

3. Click **Edit** to switch to editing mode. To set the notch filter, do one of the following:
 - Directly click **Set**. The resonant frequency that are shown on the page will be set to corresponding notch filter.
 - [Manually set the resonant frequency](#)
4. Click **Send** to make the setting effective.

7.2.1 Comment on Filter Mode

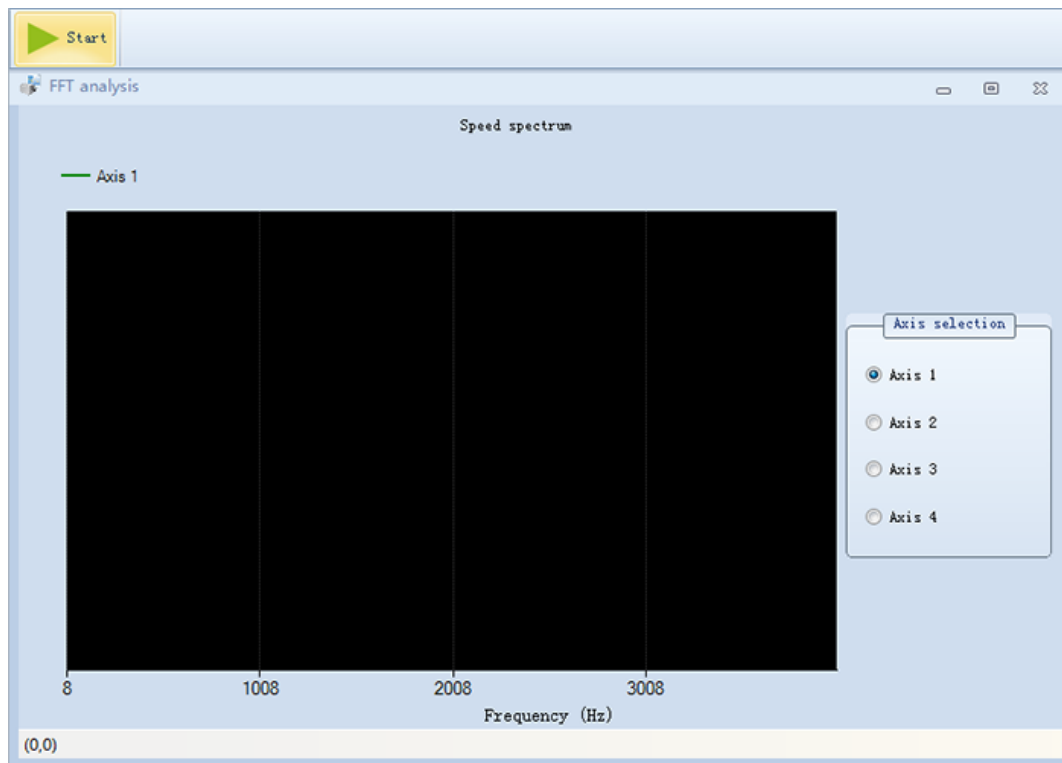
See the table below for setting of filter mode:

| Setting Value | Comment |
|----------------------------------|--|
| 0: Invalid | Self-adaptive filter is disabled. |
| 1: 1 valid | The resonance frequency of the third (3rd) notch filter is set automatically. The resonance frequency of the first (1st), second (2nd), and the fourth (4th) notch filter need to be manually input according to the result of "FFT analysis". |
| 2: 2 valid | The resonance frequency of the third (3rd) and fourth (4th) notch filter is set automatically. The resonance frequency of the first (1st), second (2nd) notch filter need to be manually input according to the result of "FFT analysis". |
| 3: Resonance frequency test mode | The resonance frequency can be shown automatically or set manually according to the result of "FFT analysis". |
| 4: Applicable result clear | Clear the applicable result. |

7.2.2 Manually Set Resonant Frequency

According to the result of FFT analysis, enter the resonant frequency of the filter by your own.

1. Click **Gain** → **Vibration Resistance** to open the dialog box named **Vibration Resistance**.
2. Click **Trial Run** or use external commands to run the servo motor.
3. Click **Other** → **FFT analysis** to open the dialog box named **FFT analysis**, as shown below:



4. On the page of **FFT analysis**, click **Start**.

In **FFT Analysis** window, motor speed spectrum will be shown, based on which the resonant frequency can be read.

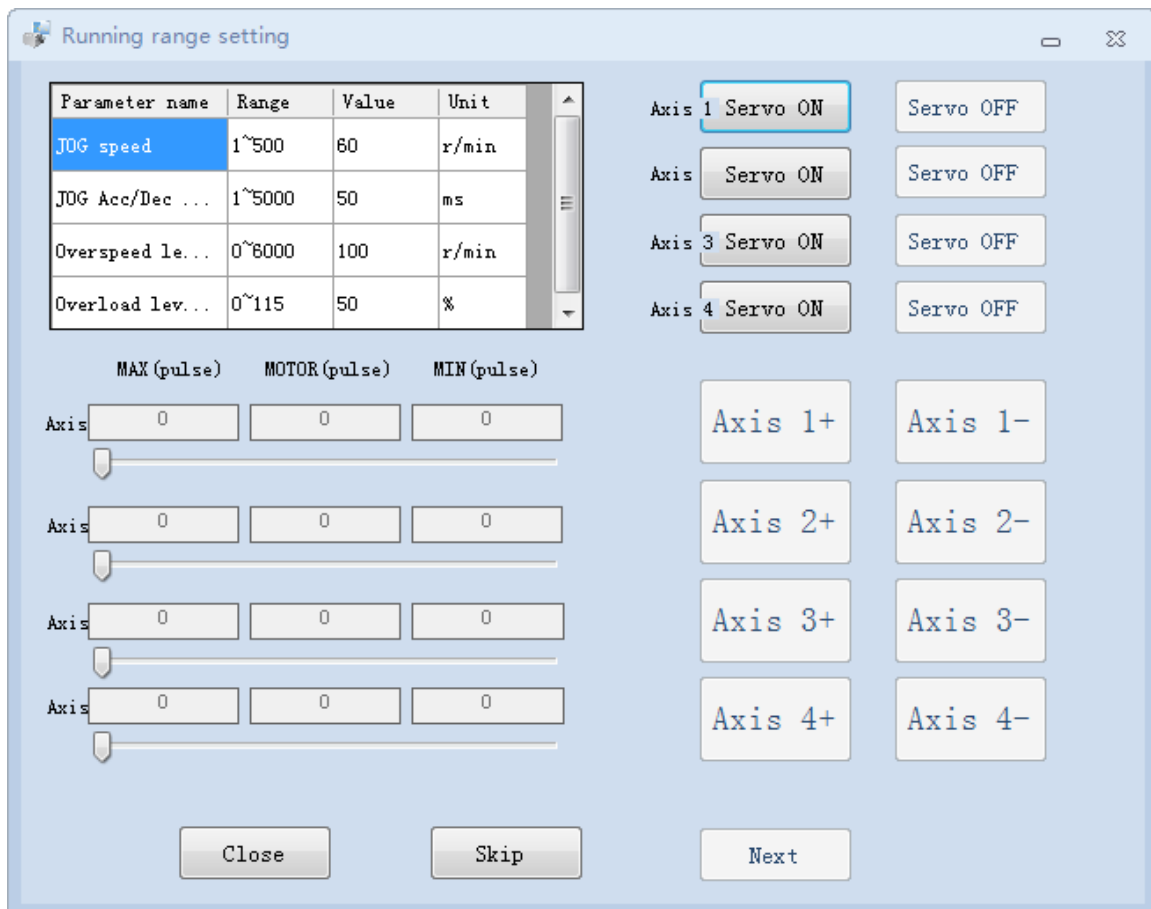
5. Return to the page of **Vibration Resistance**, and click **Edit**. The resonant frequency that has been read will be filled into the column **Frequency**.
6. Click **Set**.
7. Click **Send** to make the setting effective.

8 Trial Run

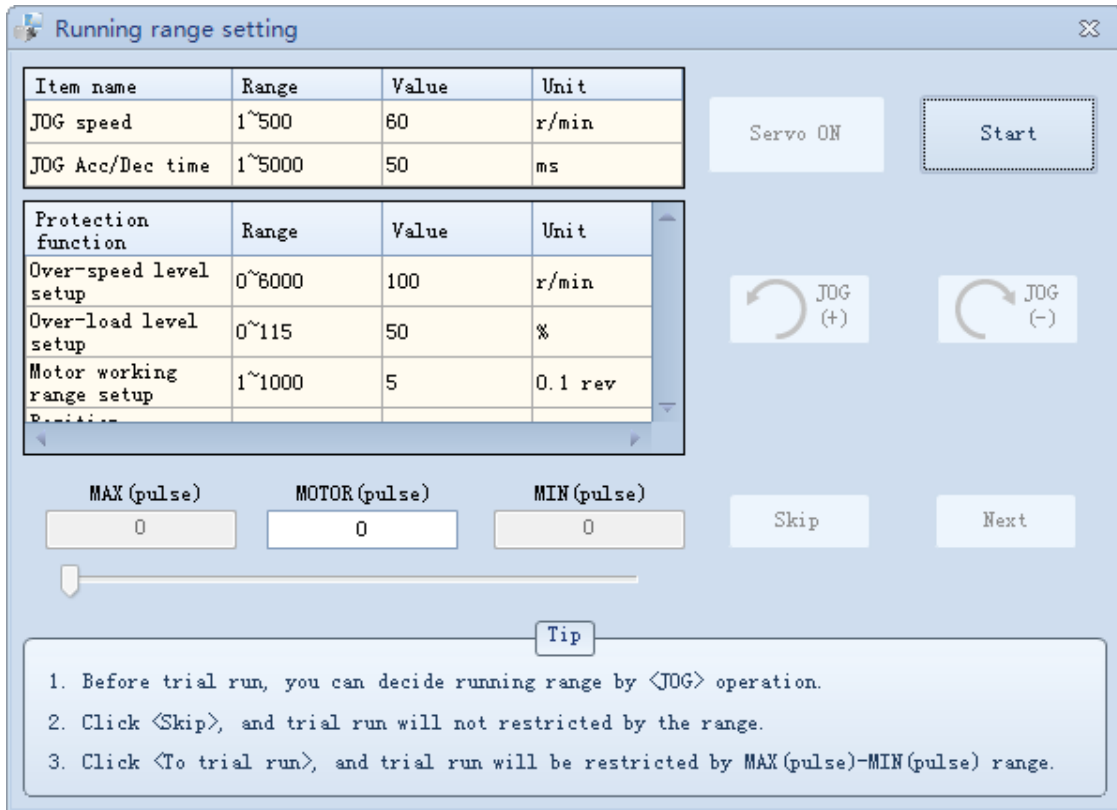
After well connection between the servo drive and the computer, you can use **Trial Run** function in **iMotion** software to make the servo motor rotate.

8.1 Trial Run Window

Click **Trial Run** to open a window named **Running Range Setting**, as shown below:



In single-axis application, information of other axes is absent, as shown in the following figure:



1. Parameter list, where you can modify the parameter setting.
2. Setting area of the motor running range.
 - MAX(pulse): the maximum position when the motor rotates to the left.
 - MOTOR(pulse): the current position of the motor.
 - MIN(pulse): the maximum position when the motor rotates to the right.
3. Operating buttons.
 - Servo ON
 - Start
 - JOG(+): the motor rotates in CW direction.
 - JOG(-): the motor rotates in CCW direction.
 - Skip: click the button to switch to **Trial Run** window. At this time, the motor running range will not be restricted by the settings of MAX and MIN.
 - To Trial Run: click the button to switch to **Trial Run** window. At this time, the motor running range will be restricted by the settings of MAX and MIN.

8.2 Check before Trial Running

Before executing **Trial Run**, make sure there is no alarms or errors. For more details, see section 9.

8.3 Set Movable Range for Motor Running

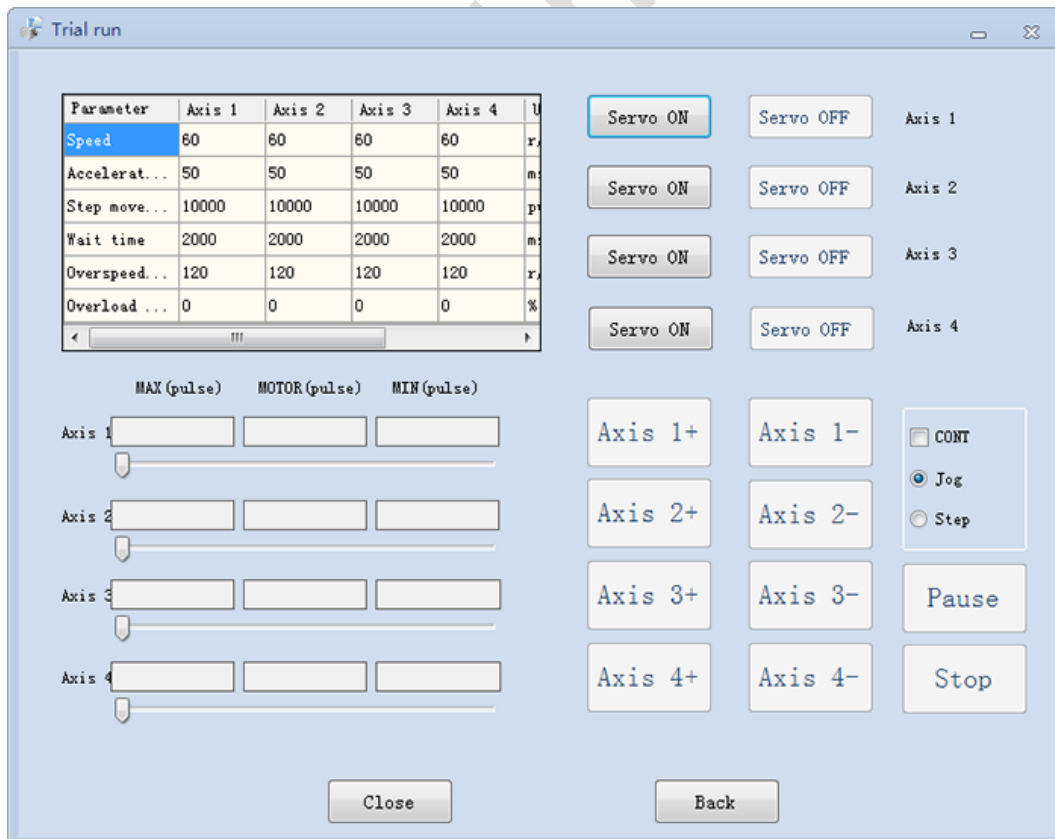
Set the movable range for the motor running, and use **JOG** function to confirm that the motor works well.

Please do the following:

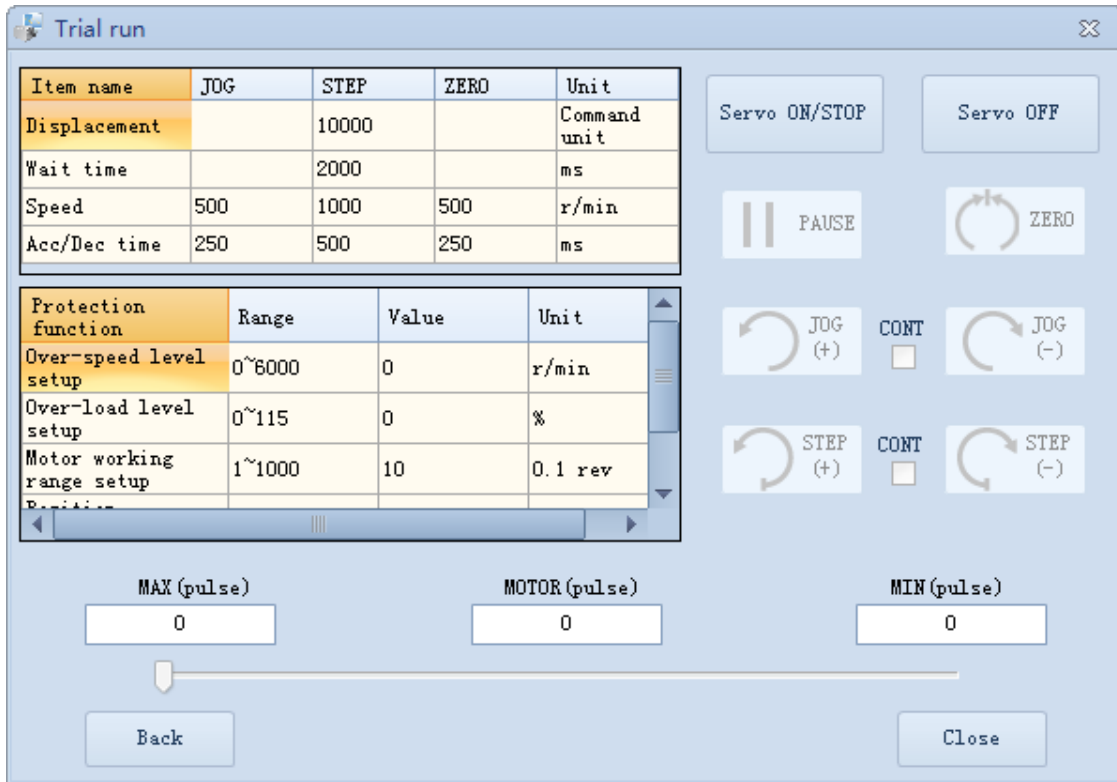
1. In **Trial Running Range Setting** window, click **Start**.
2. Click **Servo ON**.
3. Click **JOG+**, **JOG-** to rotate the motor. You need to make sure that the motor action is normal.
4. In fields of **MAX**, **MIN**, enter the movable range of the motor rotation.

8.4 Execute Trial Running

After setting of the motor running range, click **Skip** or **Trial Run** to open a window named **Trial Run**, as shown below:



In **iMotion** software of single-axis, there is only one axis, as shown below:



Servo ON/Stop

To enable the servo.

To disable the servo in the following conditions: in the process of executing ZERO, JOG, and STEP; under the state of PAUSE.

Servo OFF

If the parameters that are related with trial running have been set, clicking **Servo OFF** will deactivate the settings of trial running range.

PAUSE

In process of executing ZERO, JOG, and STEP, the motor will speed down if the **PAUSE** button is clicked.

Click the button again, the motor will resume the interrupted action.

ZERO

To return to the origin, namely, the position of zero.

JOG+, JOG-

If **CONT.** is checked, once **JOG+** is clicked, the motor will speed up to specified speed within set time; once **JOG-** is clicked, the motor will speed down within set time. If there is soft limit, the motor will stop at the soft limit; otherwise, the motor keeps running.

If **CONT.** is not checked, once **JOG+** is clicked, the motor will speed up to the specified speed within set time and run with that speed; once **JOG-** is clicked, the motor will speed down within set time and run with that speed. And if the button is released, the motor speeds down to 0 within the set time.

STEP+, STEP-

If **CONT.** is checked, once **STEP+** or **STEP-** is clicked, the motor moves forward and backward repeatedly with the current position as datum.

If **CONT.** is not checked, once **STEP+** or **STEP-** is clicked, the motor moves to the set distance.

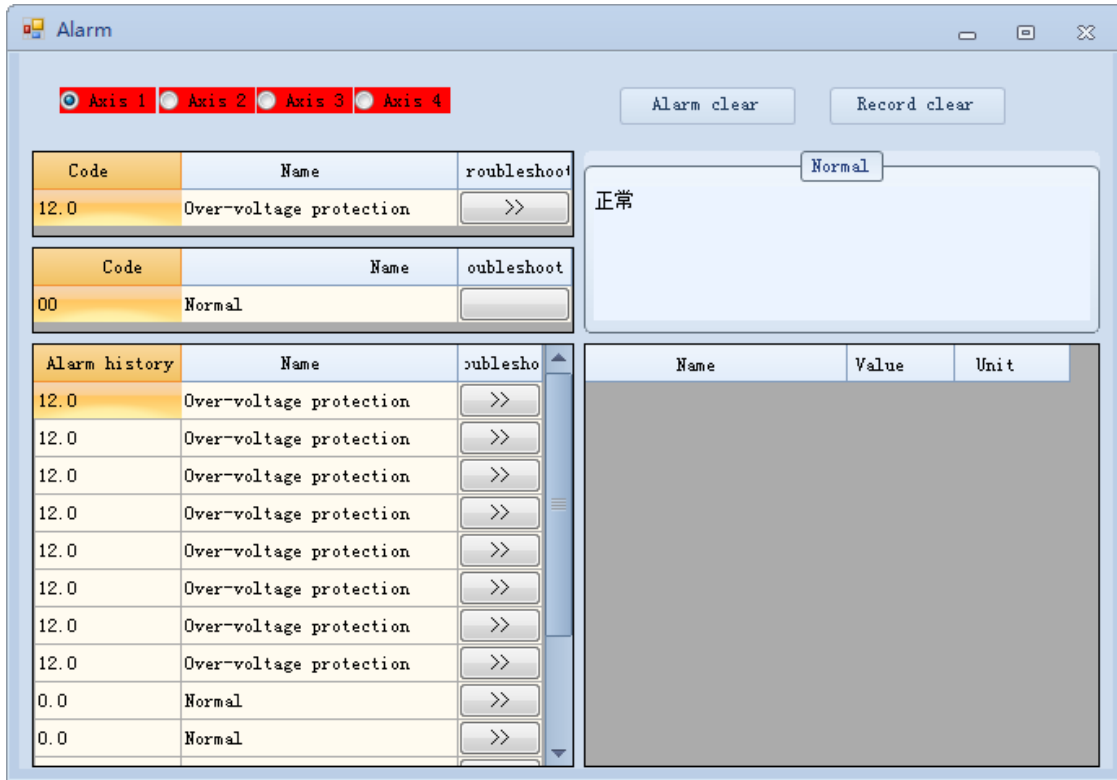
NOTE: If the moving distance exceeds either the range of MAX or MIN, please do the following: - Modify the value of STEP in the parameter list. - Return to **Trial Run** window, and modify the values of MAX and MIN.

9 Check and Remove Alarm

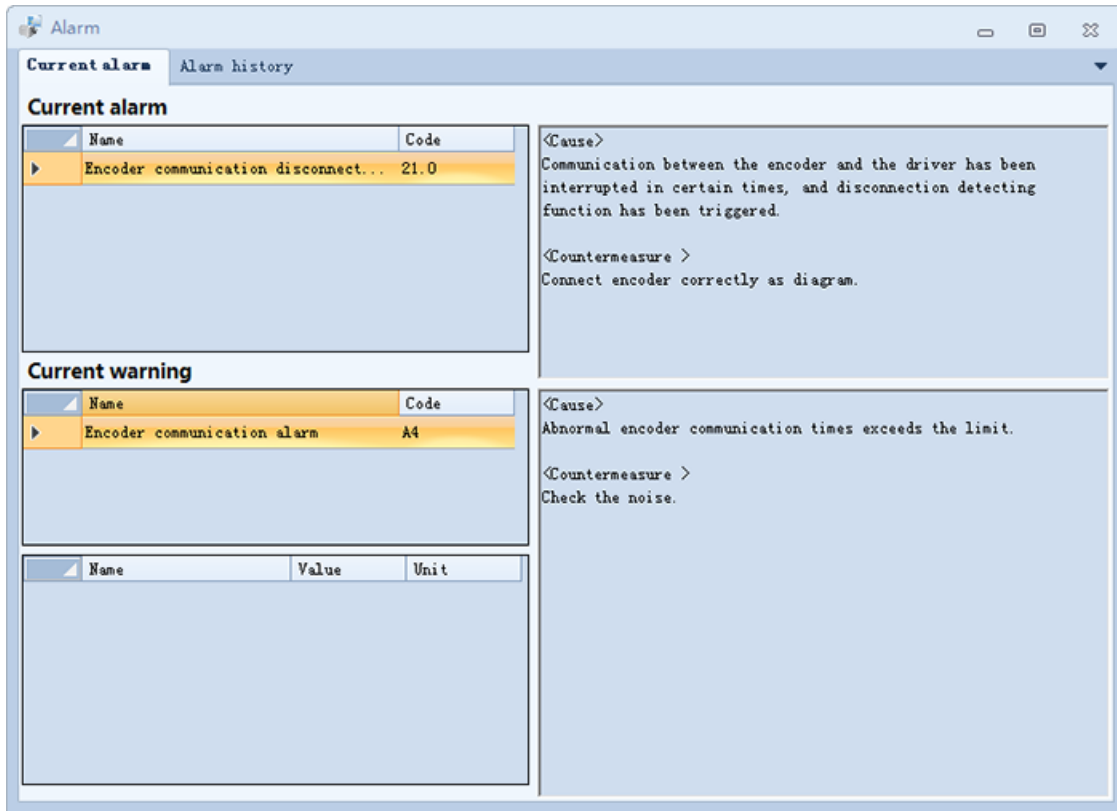
If any alarm occur to the servo drive, **iMotion** software will pops out **Alarm** window, where alarms are displayed. The users can do as the instructions to troubleshoot and remove the alarms. If alarms remain, the window shows on the front all the time.

9.1 Check the Alarms

Click **Alarm** to open the dialog box named **Alarm**, as shown below:



In **iMotion** of single-axis application, the dialog box is as shown below:



In the dialog box, you can check the following information:

1. Ongoing alarms, including the alarm name and its error code.
2. Alarm history that has occurred before. Up to 14 pieces of alarms can be recorded.
3. Possible causes for the alarm.
4. Recommended countermeasures for the alarm.
5. Motor information when the alarm occurs.

9.2 Remove the Alarm

After any alarm occurs to the servo drive, find the causes and try to remove the alarms. You can do the following:

- In the **Alarm** window, click **Alarm Clear** to remove the currently ongoing alarms.

NOTE: For alarms that cannot be cleared, this operation is invalid.

- Click **Record Clear** to remove all alarms in the list of **Alarm History**.
- For alarms that cannot be cleared, refer to the causes and countermeasures that are provided in **Alarm** window.

10 Set Pin Definitions (In Case of Single-axis)

In **iMotion** software, you can use **Pin Definition** function to directly set signals for the output ports of WISE series servo drive.

For more details about output signals of WISE servo drive, please refer to *Chapter: Allocation of IO Signals in WISE Series Servo Drive User's Manual*.

10.1 Default Settings of Input and Output Ports

With parameter settings, definition and function of an input or output port can be changed, but the logic of the port cannot be changed.

See table below for the default settings of input ports:

| Pin No. | Port No. | Para. | Default setup | Factory Setting Layout | | | | | |
|---------|----------|-------|------------------------|------------------------|-----------|---------------|-----------|----------------|-----------|
| | | | | Position Control | | Speed Control | | Torque Control | |
| | | | | Signal | Logic | Signal | Logic | Signal | Logic |
| 44 | SI1 | Pr400 | 00000000h (0) | Invalid | — | Invalid | — | Invalid | — |
| 30 | SI2 | Pr401 | 00000E00h (3584) | — | — | INTSPD1 | a-contact | — | — |
| 15 | SI3 | Pr402 | 00000F00h (3840) | — | — | INTSPD2 | a-contact | — | — |
| 14 | SI4 | Pr403 | 00020202h (131586) | NOT | b-contact | NOT | b-contact | NOT | b-contact |
| 43 | SI5 | Pr404 | 00010101h (65793) | POT | b-contact | POT | b-contact | POT | b-contact |
| 29 | SI6 | Pr405 | 00111108h (1118472) | INH | a-contact | ZEROSPD | a-contact | ZEROSPD | a-contact |
| 42 | SI7 | Pr406 | 00030303h (197379) | SRV-ON | a-contact | SRV-ON | a-contact | SRV-ON | a-contact |
| 13 | SI8 | Pr407 | 00000007h (7) | CL | a-contact | — | — | — | — |

See table below for the default settings of output ports:

| Pin No. | Port No. | Para. | Default setup | Factory Setting Layout | | | | | |
|---------|----------|-------|-----------------------|------------------------|-----------|------------------|-----------|----------------|-----------|
| | | | | Position Control | | Velocity Control | | Torque Control | |
| | | | | Signal | Logic | Signal | Logic | Signal | Logic |
| 18/3 | SO1 | Pr408 | 00030303h (197379) | BRK-OFF | a-contact | BRK-OFF | a-contact | BRK-OFF | a-contact |
| 35 | SO2 | Pr409 | 00020202h (131586) | S-RDY | a-contact | S-RDY | a-contact | S-RDY | a-contact |
| 19/4 | SO3 | Pr410 | 00010101h (65793) | ALM | a-contact | ALM | a-contact | ALM | a-contact |
| 34 | SO4 | Pr411 | 00050504h (328964) | INP | a-contact | AT-SPEED | a-contact | AT-SPEED | a-contact |
| 17/2 | SO5 | Pr412 | 00070707h (460551) | ZSP | a-contact | ZSP | a-contact | ZSP | a-contact |
| 33 | SO6 | Pr413 | 00060606h (394758) | TLC | a-contact | TLC | a-contact | TLC | a-contact |
| 16/1 | SO7 | Pr414 | 00080808h (526344) | V-COIN | a-contact | V-COIN | a-contact | V-COIN | a-contact |

See the following for descriptions for symbols in the table:

- “A connect” represents active low:
 - When the input port disconnects with COM port, the function is disabled (OFF).
 - When the input port connects with COM port, the function is enabled (ON).
- “B connect” represents active high:
 - When the input port disconnects with COM port, the function is enabled (ON).
 - When the input port connects with COM port, the function is disabled (OFF).
- “—” represents no function has been defined for the input port.

10.2 How to Set Pin Definition

For input ports and output ports, procedures are the same. Therefore, this section takes the input ports as the example to show how to set pin definitions for the input ports.

Please firstly close the following windows:

- **Parameter** window
- **Gain** window

To set definitions for the pins, please do the following:

1. Click **Pin Definition** to open the window named **Pin Definition Setting**, as shown below:

Pin definition setting
✕

Input

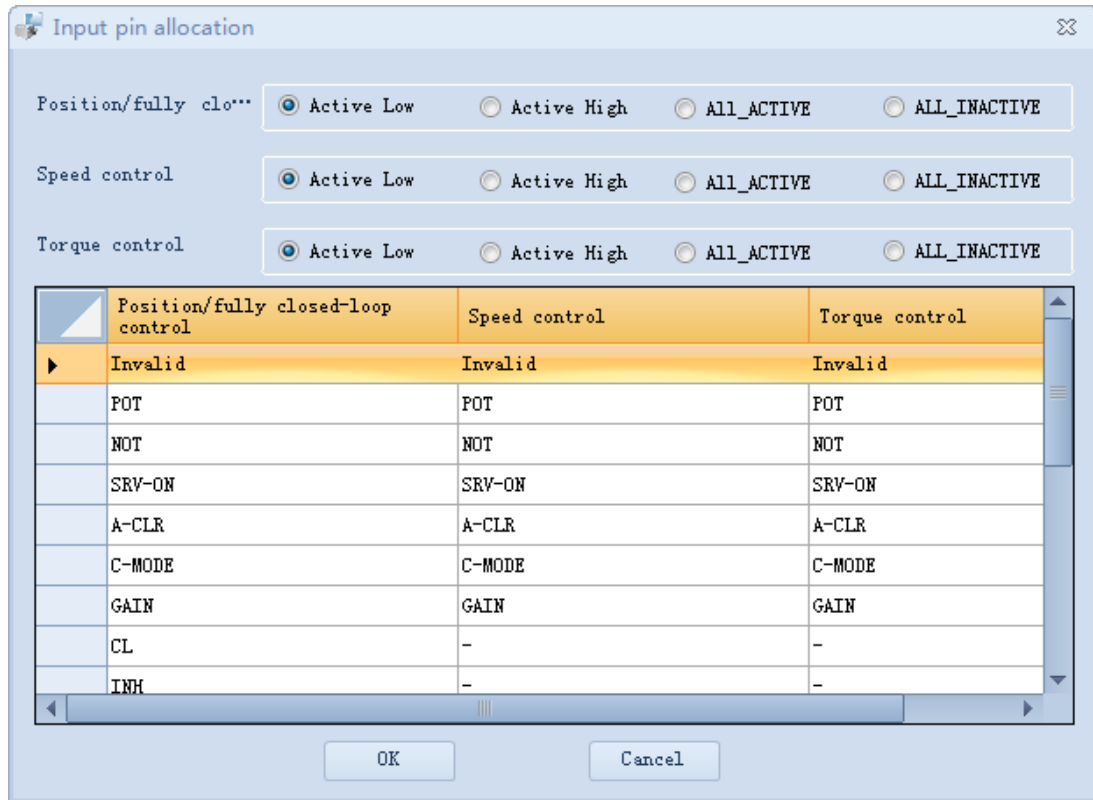
| | Pin No. | Position control | Speed control | Torque control |
|---|----------|-------------------|--------------------|--------------------|
| ▶ | 44 (SI1) | Invalid | Invalid | Invalid |
| | 46 (SI2) | Invalid | INTSPD1_Active Low | Invalid |
| | 45 (SI3) | Invalid | INTSPD2_Active Low | Invalid |
| | 43 (SI4) | NOT_Active High | NOT_Active High | NOT_Active High |
| | 42 (SI5) | POT_Active High | POT_Active High | POT_Active High |
| | 41 (SI6) | INH_Active Low | ZEROSPD_Active Low | ZEROSPD_Active Low |
| | 40 (SI7) | SRV-ON_Active Low | SRV-ON_Active Low | SRV-ON_Active Low |
| | 14 (SI8) | CL_Active Low | Invalid | Invalid |

Output

| | Pin No. | Position control | Speed control | Torque control |
|---|-------------|--------------------|---------------------|---------------------|
| ▶ | 29/30 (S01) | BRK-OFF_Active Low | BRK-OFF_Active Low | BRK-OFF_Active Low |
| | 39 (S02) | S-RDY_Active Low | S-RDY_Active Low | S-RDY_Active Low |
| | 31/32 (S03) | ALM_Active High | ALM_Active High | ALM_Active High |
| | 38 (S04) | INP_Active Low | AT-SPEED_Active Low | AT-SPEED_Active Low |
| | 27/28 (S05) | ZSP_Active Low | ZSP_Active Low | ZSP_Active Low |
| | 37 (S06) | TLC_Active Low | TLC_Active Low | TLC_Active Low |
| | 25/26 (S07) | V-COIN_Active Low | V-COIN_Active Low | V-COIN_Active Low |

Save
Cancel

- In the input pin list, double click the target pin to open the dialog box named **Input Pin Allocation**, as shown below:



- Set the contact method in different control modes.

NOTE: For more details, refer to [Default Settings of Input and Output Ports](#) or *Chapter: Allocation of IO Signals* in *WISE Series Servo Drive User's Manual*.

- Click **OK**.
- Click **Save**.

The parameters will be written into EEPROM. Restart the drive to make it effective.

11 Set Pin Definitions (In Case of Multi-axis)

In **iMotion** software, you can use **Pin Definition** function to directly set signals for the output ports of WISE series servo drive.

For more details about output signals of WISE servo drive, please refer to *Chapter: Allocation of IO Signals in WISE Series Servo Drive User's Manual*.

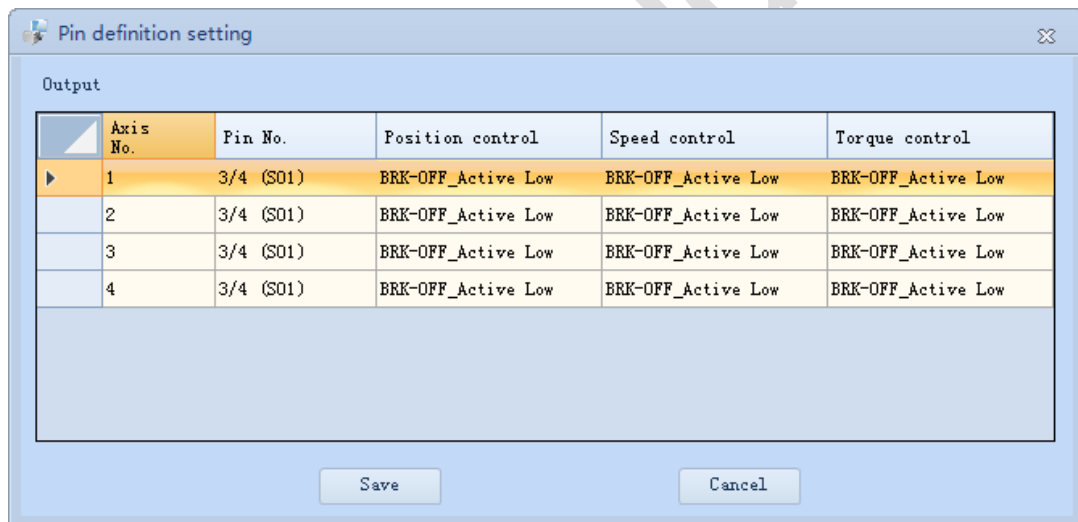
11.1 How to Set Pin Definition

Please firstly close the following windows:

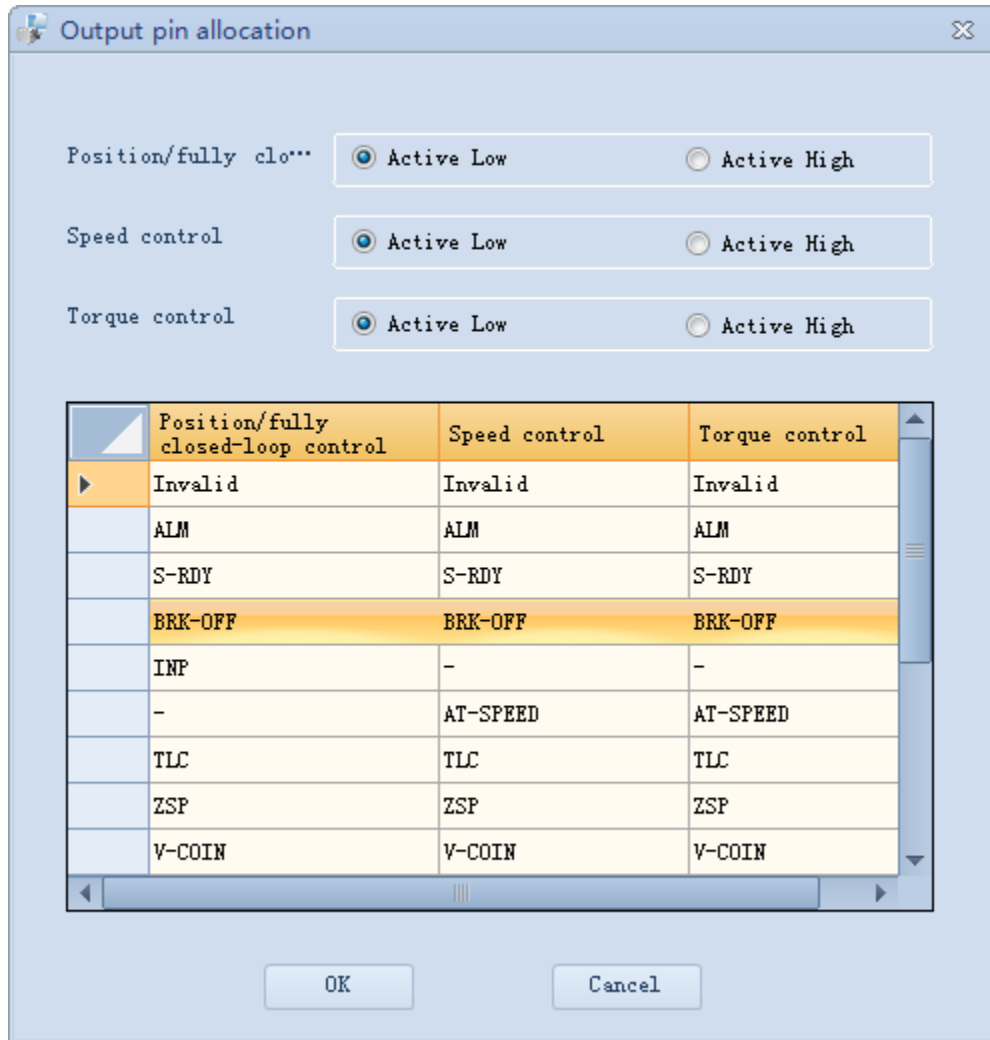
- **Parameter** window
- **Gain** window

To set definitions for the pins, please do the following:

1. Click **Pin Definition** to open the window named **Pin Definition Setting**, as shown below:



- In the output pin list, double click the target pin to open the dialog box named **Output Pin Allocation**, as shown below:



- Set the contact method in different control modes.

NOTE: For more details, refer to [Default Settings of Input and Output Ports](#) or *Chapter: Allocation of IO Signals in WISE Series Servo Drive User's Manual*.

- Click **OK**.
- Click **Save**.

The parameters will be written into EEPROM. Restart the drive to make it effective.

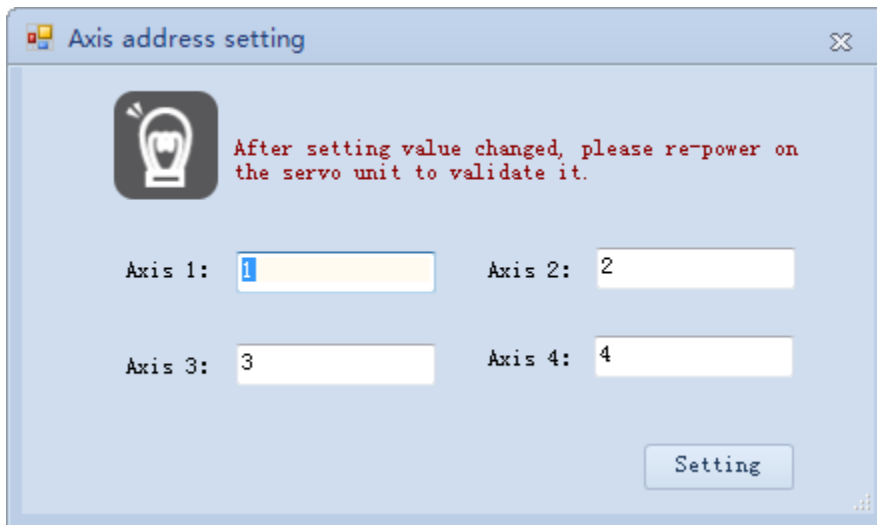
12 Set Axis Address

With proper setup of axis address, good communication among the control system, the controller and the servo drive can be guaranteed. Setup of axis address can either be done on the front panel of the servo drive, or directly be done in **iMotion** software.

Please note that the function of axis address setup is exclusively to bus-type servo drives. That is, when a servo drive of analog type or pulse type is connected, the function is unavailable.

To use **iMotion** software to set the axis address, please do the following:

1. Click **Axis Setting** to open a dialog box named “Axis address setting”, as shown below:



2. Select the target axis.

NOTE: It is recommended to set the axis address in order (X-axis:1; Y-axis:2; Z-axis: 3...). 0 means disabling the communication function.

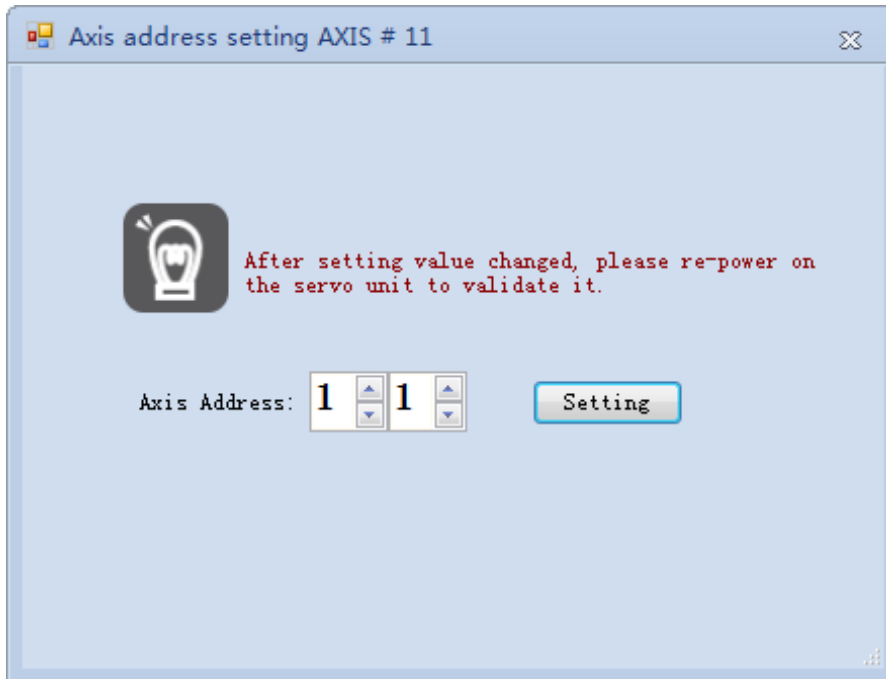
3. Set the axis index.

NOTE: In the same control system, axis address index for each servo drive cannot be duplicated.

4. Click **Set**, and click **OK** to confirm.

Restart the servo drive, and the axis address takes effect.

In **iMotion** of single-axis application, dialog box of **Axis address setting** differs slightly, as shown below:



13 Motor Setup Wizard

For motor commissioning for the first time, the user can use **Motor Setup Wizard** to set the servo motor, including the following:

- Set parameters that are related to the encoder.
- Automatically adjust the phase sequence of the motor.
- Automatically adjust CS direction.

After the motor setup finishes, the motor can work well.

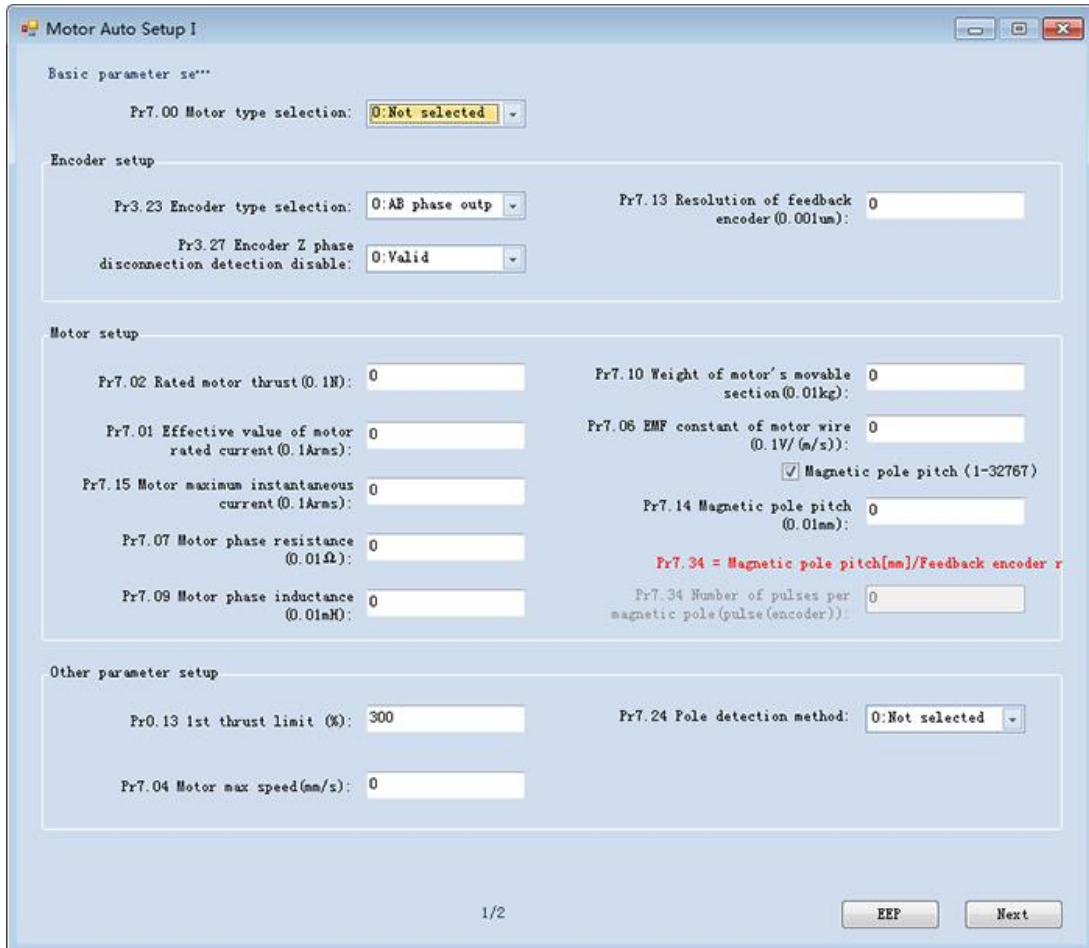
Please note that this function is exclusively to linear servo drive.

Before using **Motor Setup Wizard**, firstly confirm the following:

- Remove all alarms and errors, and make sure that the motor rotates within a safe movable range. For more information, refer to [Check and Remove Alarm](#) and [Trial Run](#).
- Close **Parameter** window first.

To use **Motor Setup Wizard**, please do the following:

1. Click **Other** → **Motor Setup Wizard** to open the dialog box **Motor Setup Wizard I** as shown below:



2. Properly set following parameters:

- Motor type
- Encoder parameters
- Motor parameters that are provided by the suppliers

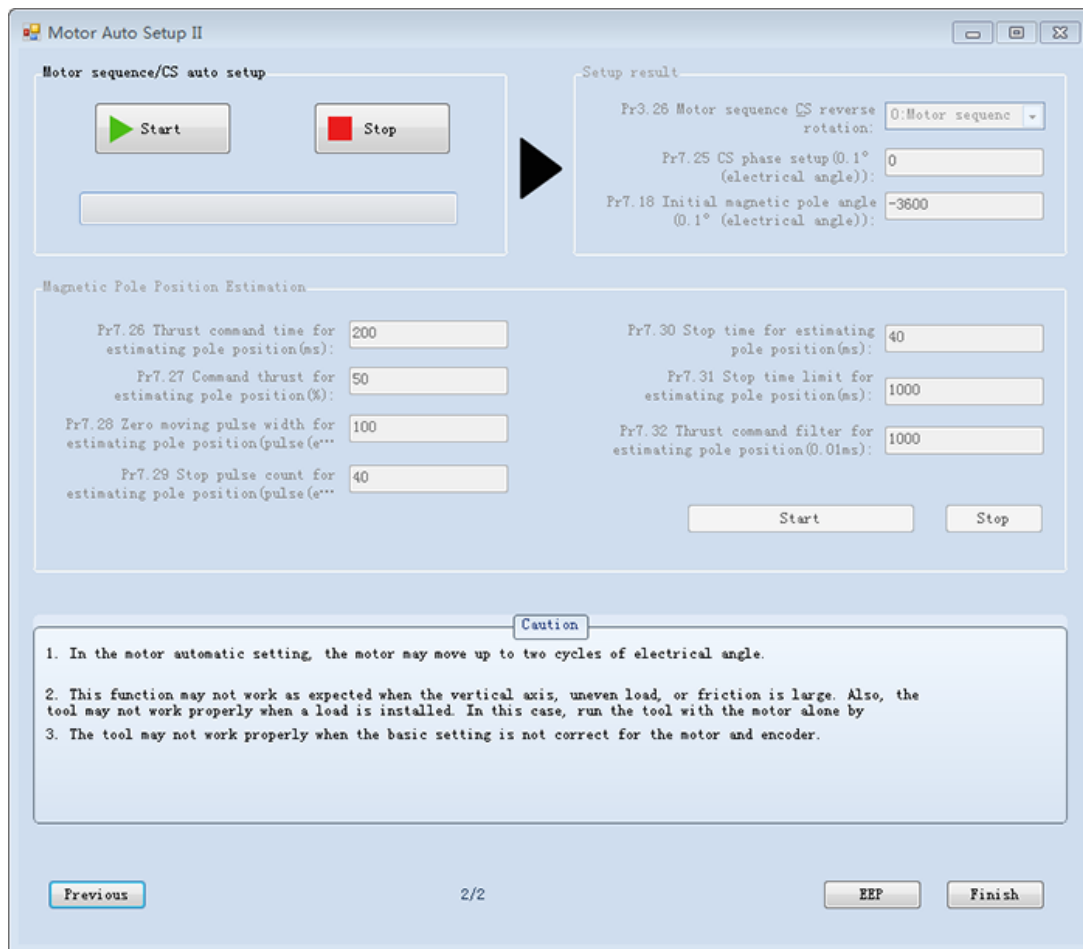
NOTE: If parameter Pr7.24 Pole detection method is set to Polar position estimation, polar position will be automatically estimated the moment the servo is enabled for the first time after powering up, and the estimation result remains valid until the motor is restarted.

3. Click **EEP**, and wait for several seconds to write into EEPROM.

After the process finishes, prompt “Write EEP successfully” will be shown.

4. Restart the servo drive.

5. Click **Next** to open the dialog box **Motor Setup II**, as shown below:



NOTE: In the dialog box **Motor Setup II**, you can set parameters that are related to polar position estimation, and test the estimation result, for example, the displacement of the servo motor.

6. Click **Start**.

Automatic setup of the motor begins.

If automatic setup of the motor fails, troubleshoot as the following:

- Check the wiring of the servo motor and the drive.
- Check parameter settings.
- Try it again.

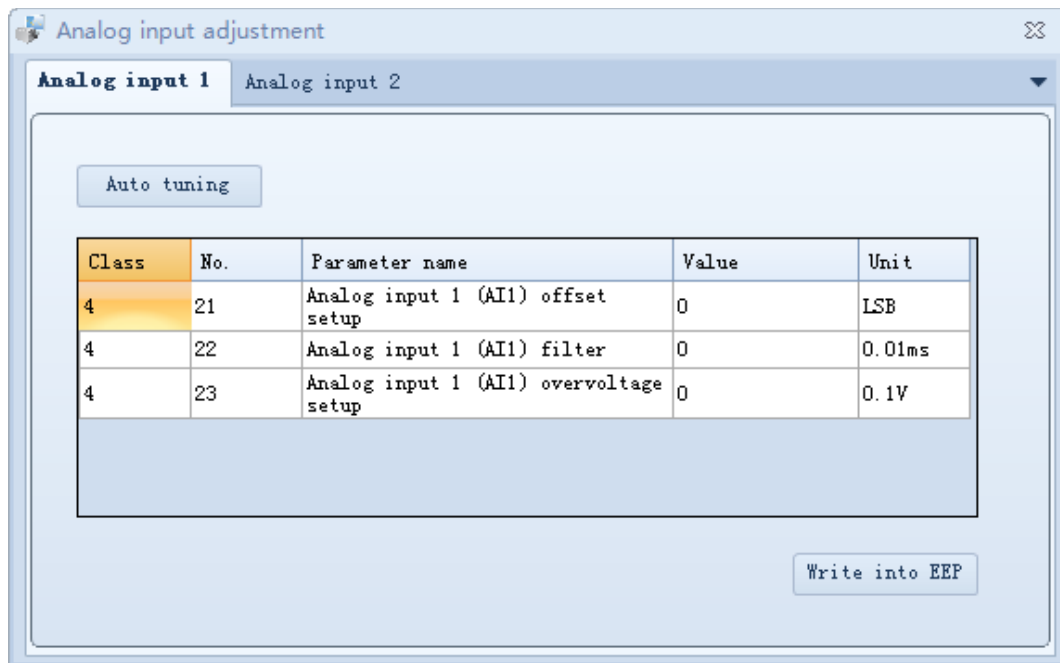
14 Adjust Analog Input

Adjusting analog inputs refers to automatically adjusting the difference of analog signals, or manually adjusting setups of the filter and over-voltage.

Firstly close the **Parameter** panel.

To execute **Analog Input Adjustment**, do the following:

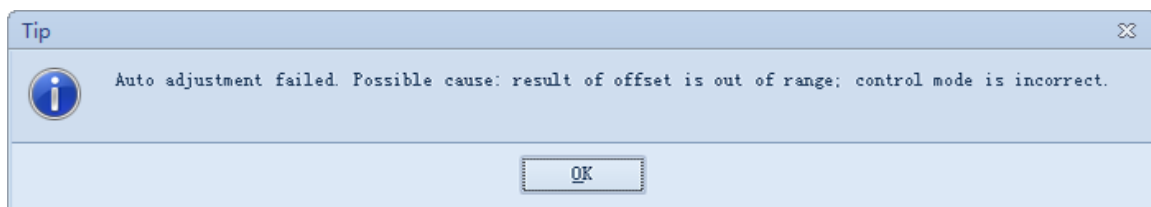
1. Click **Other** → **Analog input adjustment** to open the dialog box, as shown below:



2. Select the analog inputs, and modify the parameter setting values as desired.
3. Click **Auto Adjust** to automatically measure the difference of analog inputs.
4. After the automatic adjustment finishes, click **Write EEP**.

The system will write the parameter setting values to EEPROM of the drive.

If the automatic adjustment fails, there will be a tip, as shown below:



Make sure the proper settings of parameters, and execute automatic adjustment again.

15 Reset the Encoder

Resetting the encoder refers to initializing the absolute-type encoder.

If the data that has been recorded by the absolute-type encoder is different from the actual position, reset the encoder to unify two of them. After resetting the encoder, revolutions of absolute-type encoder will be cleared to zero, and encoder alarm will be removed as well.

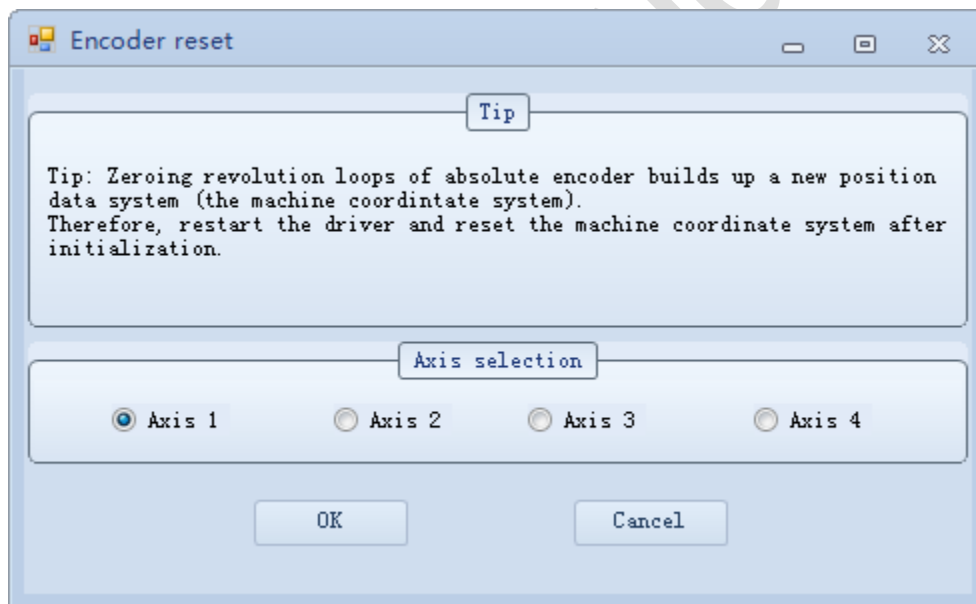
Please note that when the servo is enabled, you cannot reset the encoder. Disable the servo first, then reset the encoder.

NOTE: The servo enabling signal is absent in M2 type servo drives.

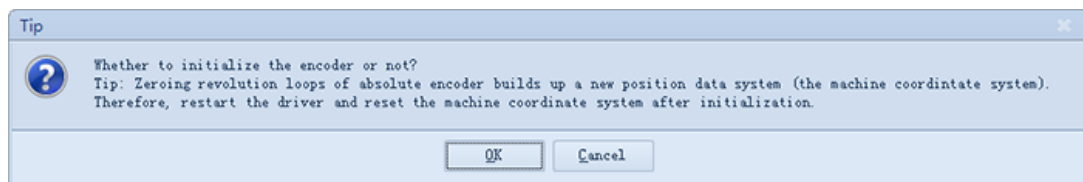
To reset the encoder, please do the following:

1. With the servo disabled, click **Other** → **Reset Encoder** to open a confirmation dialog box, as shown below:

In the scenario of multi-axis application of **iMotion**:



In the scenario of single-axis application of **iMotion**:



2. Click **OK**.

The system will automatically initialize the absolute encoder.

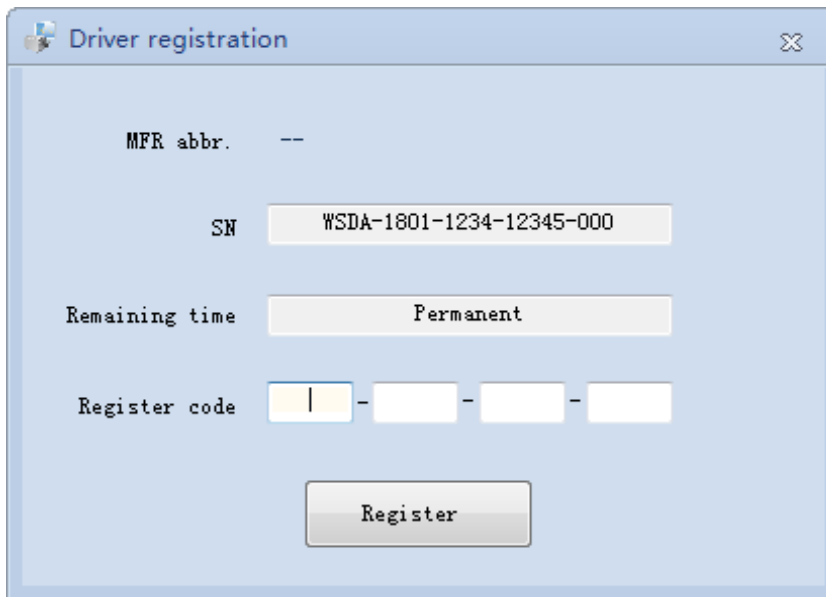
16 Register the Servo Drive

To fully guarantee the rights of suppliers, usage time of WISE servo drives can be restricted. If registered time is overdue, the servo drive stops working. At this time, the user needs a valid registration code to re-activate the drive.

iMotion software supports **Drive Registration** function, to directly view the remaining working time, and register for further use.

To register usage time of the servo drive, do the following:

1. Contact with your supplier or developer, and ask for a valid registration code.
2. On the main interface of **iMotion** software, click **Other** → **Driver Registration** to open the dialog box named “Driver Registration”, as shown below:



3. Enter the valid registration code.
4. Click **Register**.

After registration, restart the servo drive. The servo drive continues working.

17 Update the Hardware

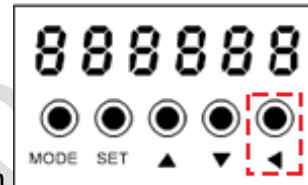
In **iMotion** software, you can update the firmware applications including DSP and FPGA.

There are two ways to update the firmware, including:

- **Automatic updating:** The software automatically scans for the firmware application in the installation package and do the updating.
- **Manual updating:** You need to select the firmware application for updating.

17.1 Preparation

Before updating the firmware, the servo drive should access the Boot mode first.

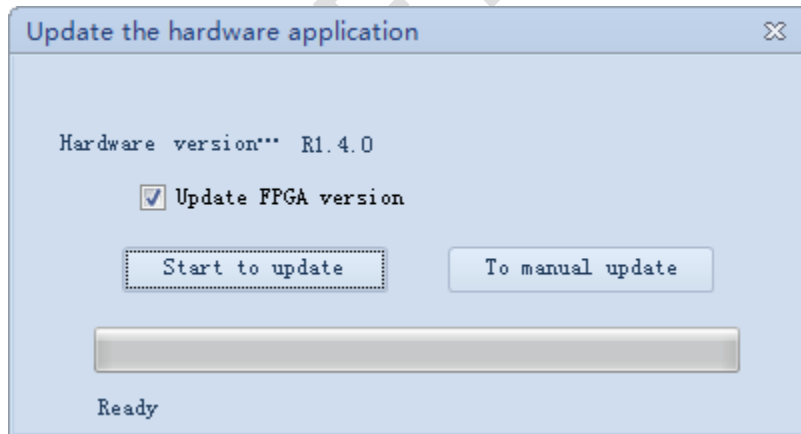


Before powering up the servo drive, press the left button several seconds to access the Boot mode.

17.2 Automatic Updating

To use the automatic updating in **iMotion** software, please do the following:

1. Click **Other** → **Update Hardware** to open the dialog box, as shown below:



In this dialog box, you can also read the current Boot version and firmware version of the servo drive.

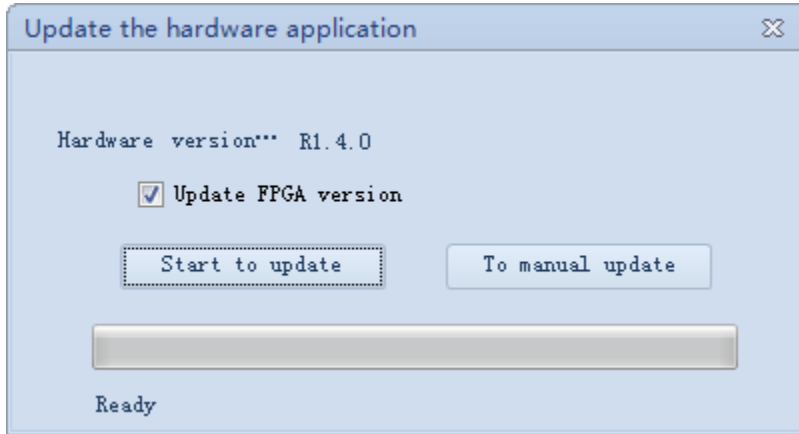
2. Click **Start Update**.

The system automatically finds the target firmware applications and starts updating. After the process finishes, restart the servo drive to take effect.

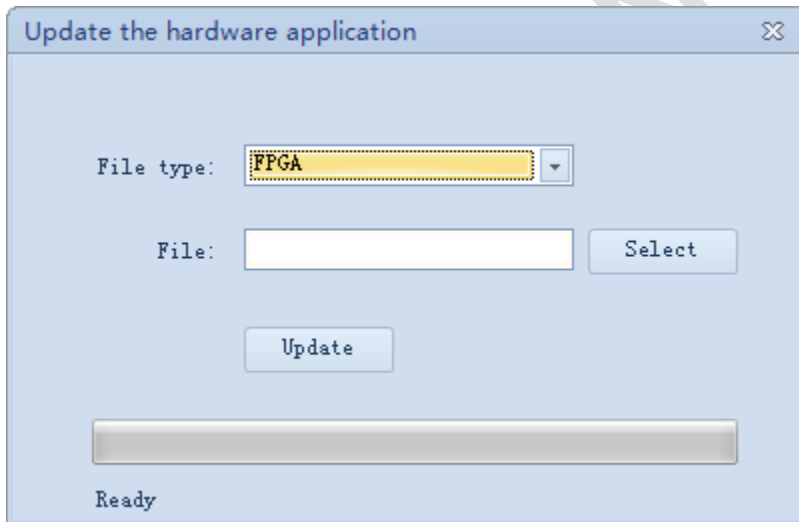
17.3 Manual Updating

To select the hardware application for updating by yourself, please do the following:

1. Click **Other** → **Update Hardware** to open the dialog box, as shown below:



2. Click **To Manual Update** to open the dialog box as shown below:



3. Select the hardware to be updated.
4. Select the target firmware application by your own.
5. Click **Update**.

The system automatically starts updating the firmware.

For manual updating, only one firmware application can be updated at one time. If more than one firmware need to be updated, repeat the procedure after the last updating finishes.

After all updating processes finish, restart the servo drive to take effect.

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Shanghai Weihong Electronic Technology Co., Ltd.

Address: No. 1590, Huhang Rd., Fengxian, Shanghai, China, 201401

Hot-line: 400 882 9188

Website: www.weihong.com.cn/en