V12 NcEditor Laser Cutting Control System Bus Type Commissioning Guide
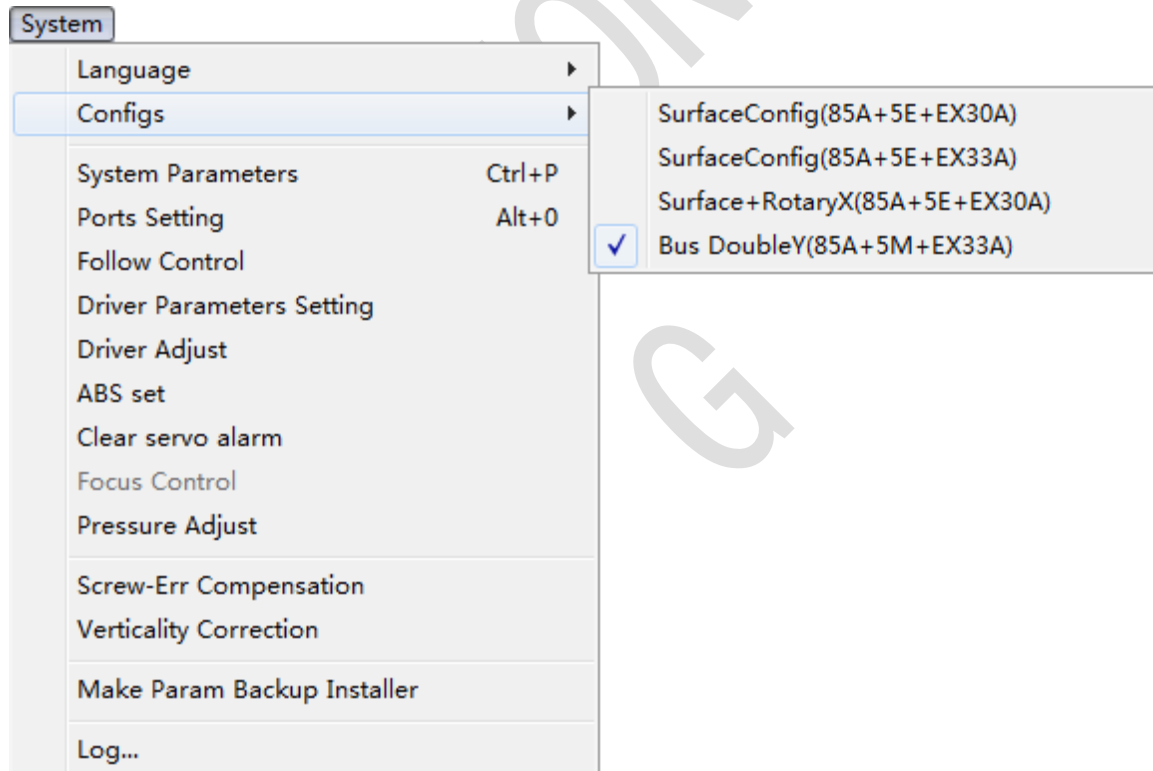
1   Checking Configuration and Wiring

1.1   Checking Production Configuration

To confirm the hardware setting is complete and correct, please refer to the following list:

- Lambda 5M controller
- PM95A servo control card
- YASKAWA driver or WISE driver of M2 fieldbus type (with terminating resistor)
- EX33A terminal board (for extension)

To confirm V12 NcEditor has been set to bus type, please refer to the following path in the menu bar:

System

| Language | ▶ | |
| Configs | ▶ | |

| SurfaceConfig(85A+5E+EX30A) |
| SurfaceConfig(85A+5E+EX33A) |
| Surface+RotaryX(85A+5E+EX30A) |
| ✓ Bus DoubleY(85A+5M+EX33A) |

System Parameters	Ctrl+P
Ports Setting	Alt+0
Follow Control	
Driver Parameters Setting	
Driver Adjust	
ABS set	
Clear servo alarm	
Focus Control	
Pressure Adjust	
Screw-Err Compensation	
Verticality Correction	
Make Param Backup Installer	
Log...	

1.2 Checking Production Wiring

Take WISE driver of M2 communication instruction type as an example. To check the wiring, please refer to the following wiring diagram.
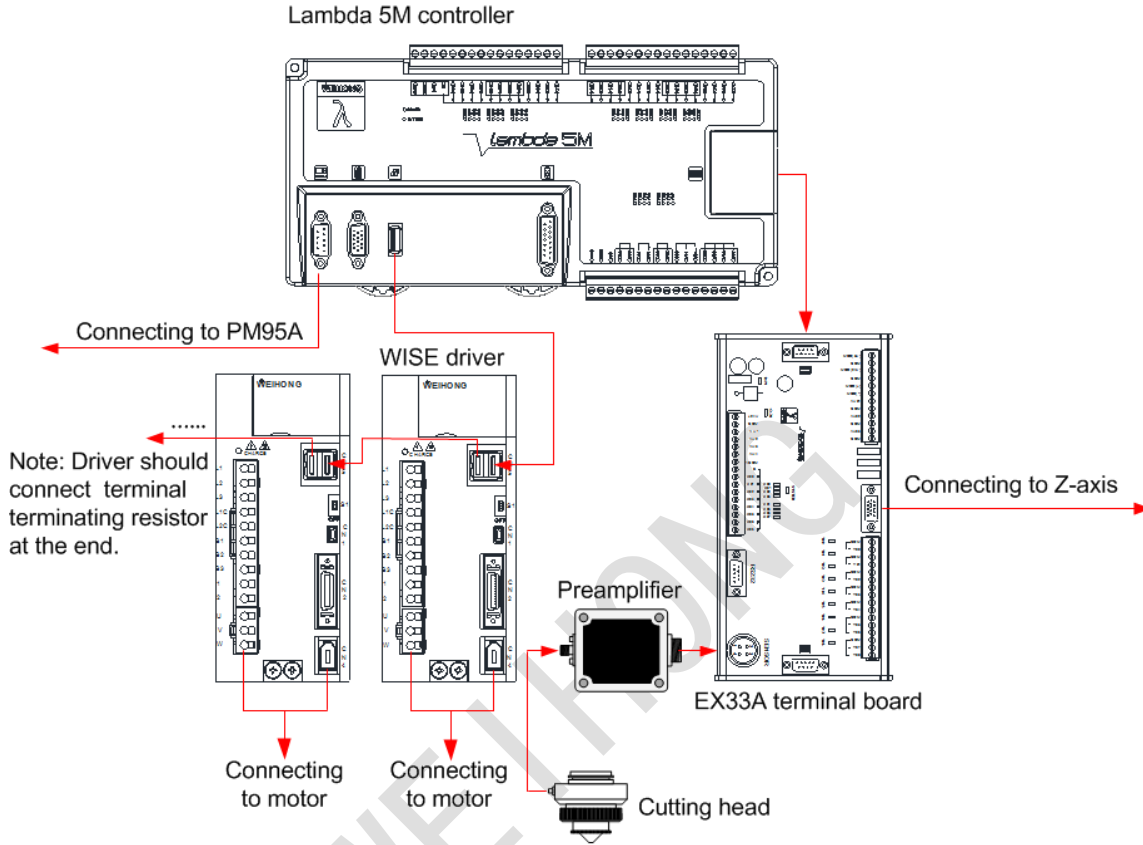
2   Setting Driver Parameters

For different types of drivers, parameters and setting methods vary from type to type.

This chapter mainly focuses on how to set the basic parameters and station address values of YASKAWA ∑5/∑7 driver and WISE driver.

To set parameters, do one of the following:

-   Set parameters on the front panel of the driver.

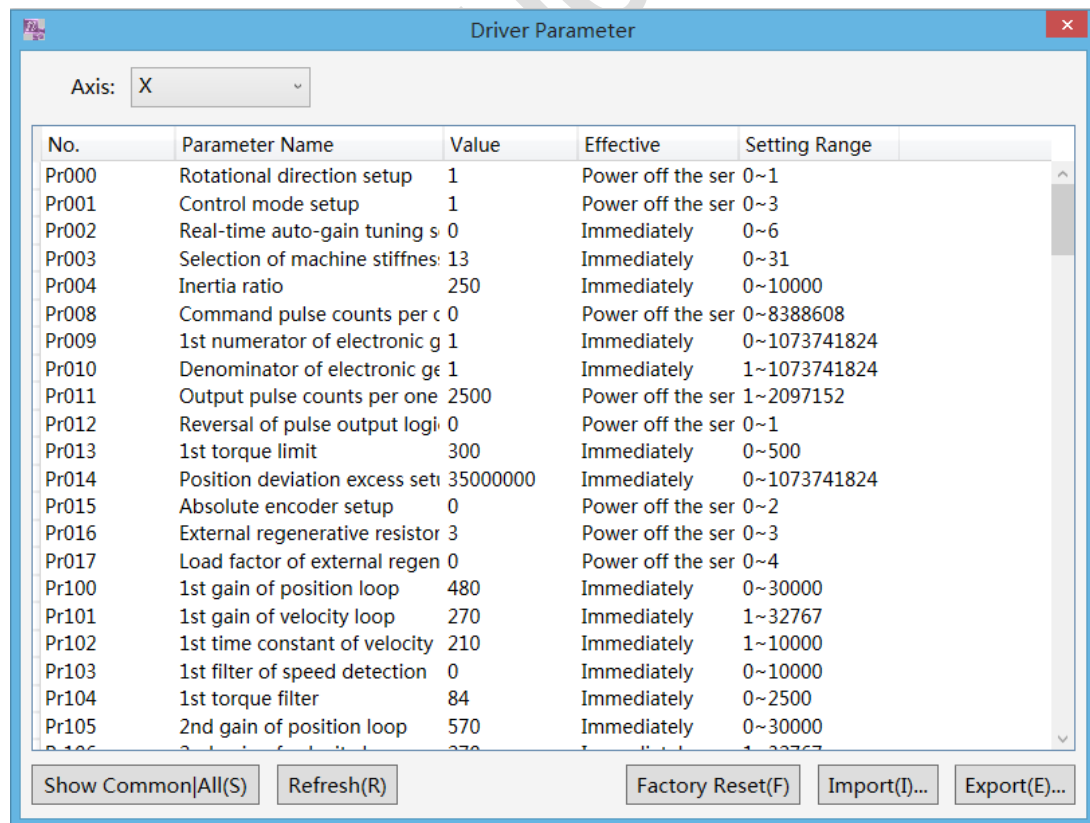   Please refer to user manual or instruction of the driver for details.

-   Set parameters in V12 NcEditor.

    Please refer to Setting Driver Parameters in NcEditor.

2.1   Setting Driver Parameters in NcEditor

To set parameters in V12 NcEditor, do the following:

1.   In the menu bar, click **System → Driver Parameters Setting**. **Driver Parameter** dialog box pops up:

No.	Parameter Name	Value	Effective	Setting Range
Pr000	Rotational direction setup	1	Power off the ser	0~1
Pr001	Control mode setup	1	Power off the ser	0~3
Pr002	Real-time auto-gain tuning s	0	Immediately	0~6
Pr003	Selection of machine stiffnes	13	Immediately	0~31
Pr004	Inertia ratio	250	Immediately	0~10000
Pr008	Command pulse counts per c	0	Power off the ser	0~8388608
Pr009	1st numerator of electronic g	1	Immediately	0~1073741824
Pr010	Denominator of electronic ge	1	Immediately	1~1073741824
Pr011	Output pulse counts per one	2500	Power off the ser	1~2097152
Pr012	Reversal of pulse output logi	0	Power off the ser	0~1
Pr013	1st torque limit	300	Immediately	0~500
Pr014	Position deviation excess set	35000000	Immediately	0~1073741824
Pr015	Absolute encoder setup	0	Power off the ser	0~2
Pr016	External regenerative resistor	3	Power off the ser	0~3
Pr017	Load factor of external regen	0	Power off the ser	0~4
Pr100	1st gain of position loop	480	Immediately	0~30000
Pr101	1st gain of velocity loop	270	Immediately	1~32767
Pr102	1st time constant of velocity	210	Immediately	1~10000
Pr103	1st filter of speed detection	0	Immediately	0~10000
Pr104	1st torque filter	84	Immediately	0~2500
Pr105	2nd gain of position loop	570	Immediately	0~30000

Axis: X

Show Common|All(S)   Refresh(R)   Factory Reset(F)   Import(I)...   Export(E)...

2.   Click **Refresh** to get the latest parameters.

3. Double click target parameter to set.

To get more information about the basic parameters that you need to set here, please refer to List of Parameters for details.

2.2 Setting Station Address

Setting right station address is the key to data transmission among NcEditor, Lambda controller and the driver.

The corresponding station address value of each axis is unique. It should be consistent with station address set value of the driver in V12 NcEditor system. If the value is set to 0, the communication function is disabled.

2.2.1 Setting Station Address of YASKAWA Driver

For a YASKAWA driver, to set station address value, do the following:

1. To enable bus function, set No. 1 ~ No.4 toggle switches to ON, ON, OFF, OFF in order.

2. To set station address No., rotate rotary switch to any number from 1 to 9.

3. It is suggested to set station address No. in order (e.g. X-axis: 1; Y-axis: 2; Z-axis: 3, etc.).

4. In V12 NcEditor, set driver station address value of current axis to station address No. that corresponds to the rotary switch.

2.2.2 Setting Station Address Value of WISE Driver

For a WISE driver, to set station address value, do the following:

1. Set parameter **Pr001 Control Mode Setup** to **1**.

2. Set station address No. as following:
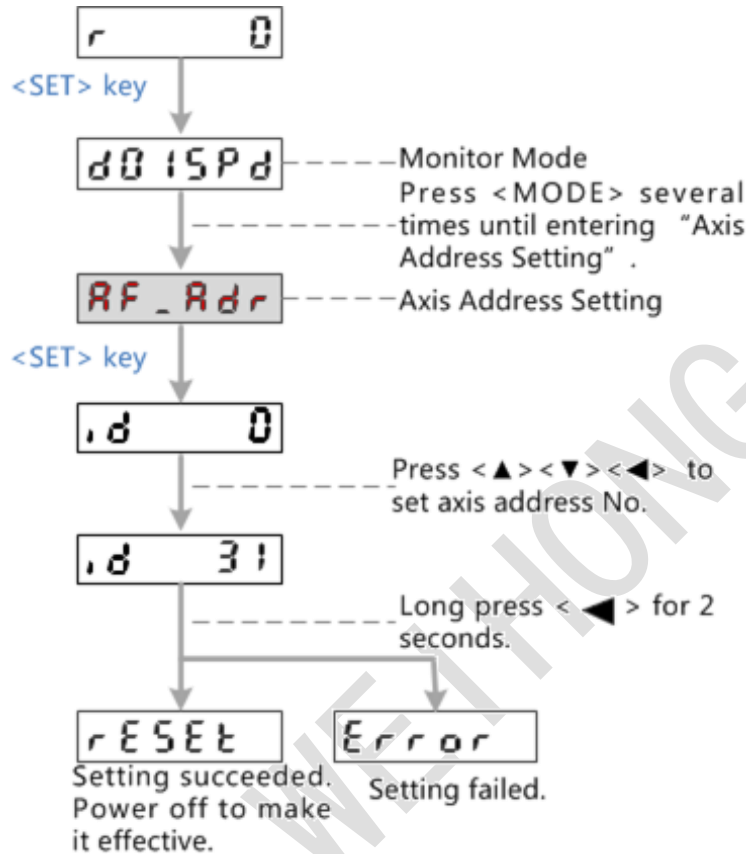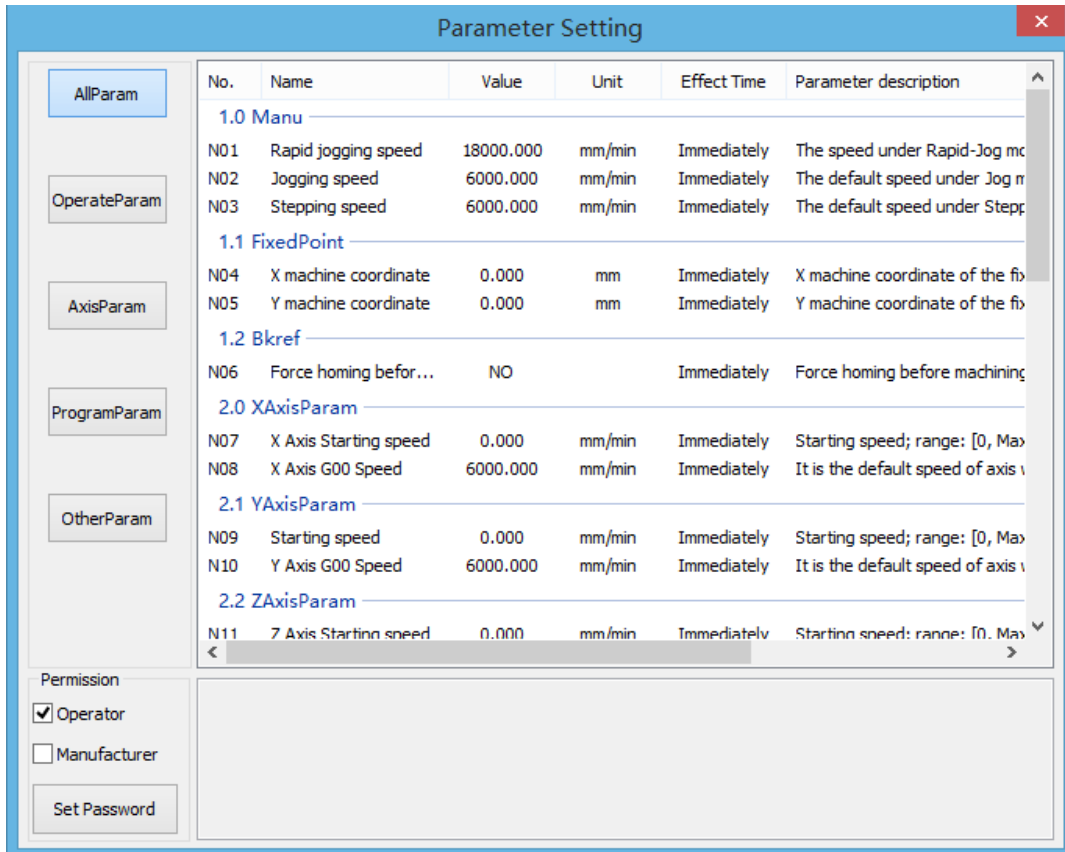
3. Restart the driver.

4. In V12 NcEditor, set driver station address value of current axis to station address No. that corresponds to the panel.

3 Setting System Parameters in NcEditor

To set system parameters in V12 NcEditor, do the following:

1. In the menu bar, click **System → System Parameters**. **Parameter Setting** dialog box pops up:

2. Check **Manufacturer** to enable manufacturer's right.

3. Double click target parameter to set.

To get more information about the basic parameters that you need to set here, please refer to List of Parameters for details.

4   Commissioning Driver

According to current machine state, the driver automatically adjusts servo gain of servo unit and optimizes response.

4.1   Before Commissioning

Before commissioning, ensure the following:

- To YASKAWA driver

    - Main circuit power is ON.
    - There is no overtravel.
    - There is no alarm and warning information.
    - Gain selection switch must be manual: Pn139=n.□ □ □ 0.
    - No motor test function selection must be invalid: Pn00C=n.□ □ □ 0.
    - HWBB function must be invalid.
    - Cannot set parameter writing inhibit setup to "Prohibit writing": Fn010= n.□ □ □ 0.
    - Free adjustment function must be invalid: Pn170=n.□ □ □ 0.
- To WISE driver

    - Main circuit power is ON.
    - There is no overtravel.
    - There is no alarm and warning information.
    - Station address setting of driver is consistent with that of software.

4.2 How to Commission Driver

To commission driver in V12 NcEditor, do the following:

1. In the menu bar, click **System → Driver Adjust**. **Driver Commissioning** dialog box pops up.
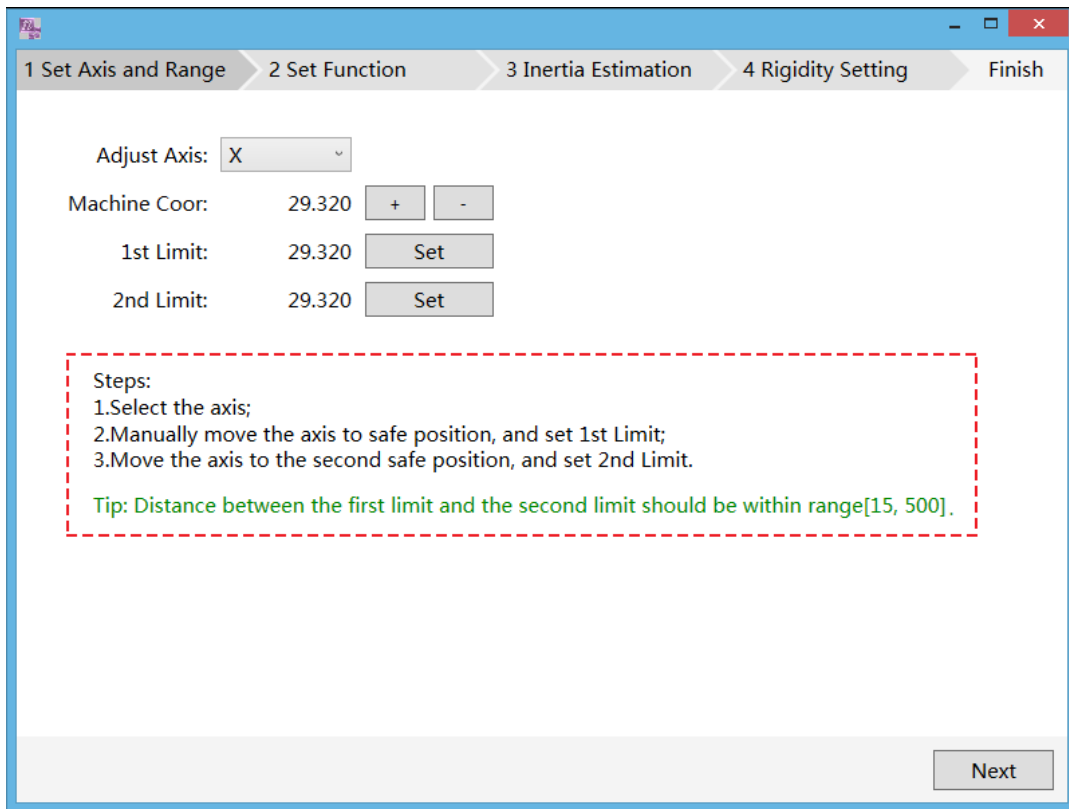
2. Set axis and range.

For detailed steps, refer to the following picture. Click **Next** after setting.

3. Set function.

Select proper **Initial Mode** and **Initial Rigidity**. Click **Next** after setting.

5. Set rigidity.

    Select proper **Mode** and **Filter Mode**. Then click **Start**. The system automatically generates the following parameters.

6. Click **Save**. Driver commissioning completes.

5   Setting Machine Origin

For different types of motors, setting machine origin methods vary from type to type:

- For absolute motor:

  - To set machine origin by setting absolute value manually, do the following:

    1. In the menu bar, click **System → Absolute Setting**. **Absolute Value** dialog box pops up:
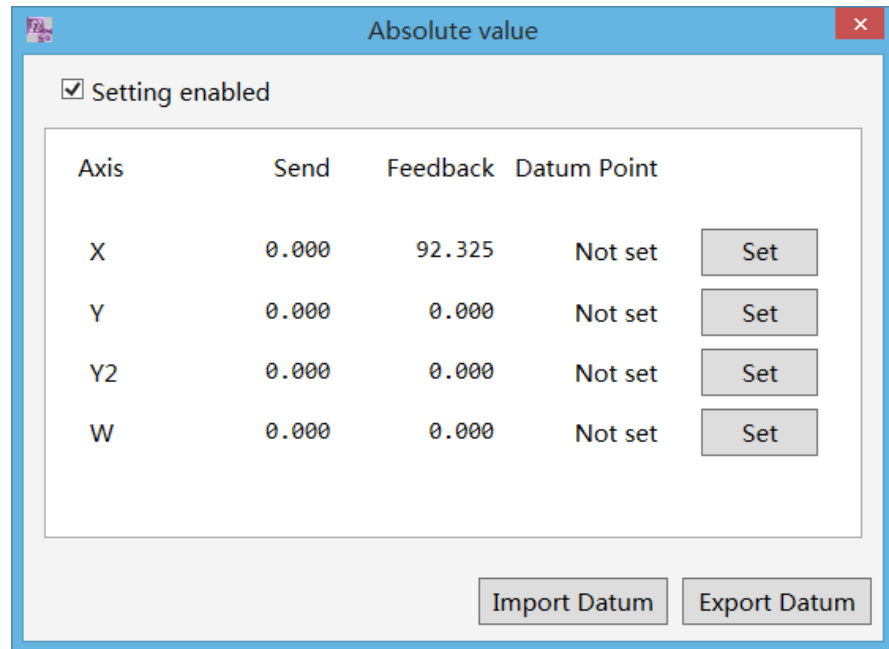
    2. Check **Setting Enabled**.

    3. Decide machine origin position by right-hand coordinate system rule. Then move cutting head to the machine origin.

    4. Click **Set** to set coordinates of X-axis, Y-axis and Y2-axis.

  - If the imported datum was set before. Click **Import Datum** in **Absolute Value** dialog box to set coordinates directly.

- For non-absolute motor:

  There is no need to set absolute value. Laser head returns to machine origin normally.

6 List of Parameters

This chapters mainly introduces basic driver and system parameters.

6.1 Basic Driver Parameters

See tables below for the basic driver parameters that you need to set properly. To get more information about other parameters, please refer to user manual or instruction of the driver.

Table of basic parameters of YASKAWA driver:

No.	Name	Set value
Pn00B	Basic switch B of function selection	0000 (three phase)/0100 (single phase)
Pn50A	Input signal selection 1	8881
Pn50B	Input signal selection 2	8888
Pn50E	Input signal selection 1	0000
Pn50F	Input signal selection 2	0100
Pn510	Input signal selection 3	0000
Pn514	Input signal selection 4	0000

Table of basic parameters of WISE driver:

No.	Name	Set value
Pr001	Control mode setup	1 (position control mode)

6.2 Basic System Parameters

In V12 NcEditor, basic parameters that you need to set are the following:

Driver station address (X/Y1/Y2)
It should be consistent with rotary switch setting of driver station address. 0 represents invalid address.

Enable absolute value
Select whether to enable absolute value.

If absolute value is enabled, the driver needs to connect to an absolute-type motor.

Driver station address set switch (X/Y1/Y2)
The value should be consistent with the driver station address rotary switch set value.

Encoder digit (X/Y1/Y2)
It refers to the digit number of encoder of the servo motor.

Numerator of electronic gear ratio (X/Y1/Y2)
It should be consistent with electronic gear ratio (numerator) of the driver.

Denominator of electronic gear ratio (X/Y1/Y2)
It should be consistent with electronic gear ratio (denominator) of the driver.

Motor rotation mode (X/Y1/Y2)
It should be consistent with motor rotation mode of the driver.

Axis encoder direction (X/Y1/Y2)
It should be consistent with axis encoder direction of the driver.

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