User Manual

GSK 25i Milling CNC System

(Volume Ⅲ　Parameter)

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✵ This user manual describes all items concerning the operation of this CNC system in detail. However, it is impossible to give particular descriptions for all unnecessary or unallowable operations due to length limitation and products application conditions；Therefore, the items not presented herein should be considered impractical or unallowable.

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Preface

Your Excellency,

    We are honored by your purchase of this GSK 25i Milling CNC System made by GSK CNC Equipment Co., Ltd.

    This book is "PARAMETER" section of the User Manual Volume Ⅲ.

Special caution:

    The power supply fixed on/in the cabinet is exclusively used for the CNC system made by GSK.

    It can't be applied to other purposes, or else it may cause serious danger.

Warning and Precaution

Accident may occur by improper connection and operation！This system can only be operated by authorized and qualified personnel.

Please read this manual carefully before operation！

Please read this manual and a manual from machine tool builder carefully before installation, programming and operation, and strictly observe the requirements.

This manual includes the precautions for protecting user and machine tool. The precautions are classified into Warning and Caution according to their bearing on safety, and supplementary information is described as Note. Read these Warnings, Cautions and Notes carefully before operation.

Warning

User may be injured or equipment be damaged if operation instructions and procedures are not observed.

Caution

Equipment may be damaged if operation instructions or procedures are not observed.

Note

It is used to indicate the supplementary information other than Warning and Caution.

Announcement

● This manual describes various possibilities as much as possible. However, operations allowable or unallowable cannot be explained one by one due to so many possibilities that may involve with, so the contents that are not specially stated in this manual shall be considered as unallowable.

Caution

● Functions, technical indexes (such as precision and speed) described in this user manual are only for this system. Actual function deployment and technical performance of a machine tool with this CNC system are determined by machine tool builder's design, so functions and technical indexes are subject to the user manual from machine tool builder.

● Refer to the user manual from machine tool builder for function and meaning of keys on control panel.

Precautions

■ **Delivery and storage**

- Packing box over 6 layers in pile is unallowed.
- Never climb the packing box, neither stand on it, nor place heavy objects on it.
- Do not move or drag the products by the cables connected to it.
- Forbid collision or scratch to the panel and display screen.
- Avoid dampness, insolation and drenching.

■ **Open-package inspection**

- Confirm that the products are the required ones.
- Check that the products are not damaged in delivery.
- Confirm that the parts in packing box are in accordance with the packing list.
- Contact us in time if any inconsistence, shortage or damage is found.

■ **Connection**

- Only qualified personnel can connect the system or check the connection.
- The system must be earthed, and the earth resistance must be less than 0.1 Ω. The earth wire cannot be replaced by zero wire.
- The connection must be correct and firm to avoid any fault or unexpected consequence.
- Connect with surge diode in the specified direction to avoid damage to the system.
- Switch off power supply before plugging out or opening electric cabinet.

■ **Troubleshooting**

- Only competent personnel are supposed to inspect the system or machine.
- Switch off power supply before troubleshooting or changing components.
- Check for fault when short circuit or overload occurs. Restart can only be done after troubleshooting.
- Frequent switching on/off of the power is forbidden, and the interval time should be at least 1 min.

Safety Responsibility

Manufacturer's Responsibility

——Be responsible for the danger which should be eliminated and/or controlled on design and configuration of the provided CNC systems and accessories.

——Be responsible for the safety of the provided CNC systems and accessories.

——Be responsible for the provided information and advice for the users.

User's Responsibility

——Be trained with the safety operation of CNC system and familiar with the safety operation procedures.

——Be responsible for the dangers caused by adding, changing or altering to the original CNC systems and the accessories.

——Be responsible for the failure to observe the provisions for operation, adjustment, maintenance, installation and storage in the manual.

All specifications and designs herein are subject to change without further notice.

This manual is reserved by end user.

We are full of heartfelt gratitude to you for supporting us in the use of GSK's products.

Contents

1 Parameter Display

The operations are shown below:

(1) Enter the parameter screen after the function key [SYSTEM] on MDI panel is controlled for many times, or press the **[Parameter]** and **[Operation]** soft keys subsequently after pressing the function key [SYSTEM] once.
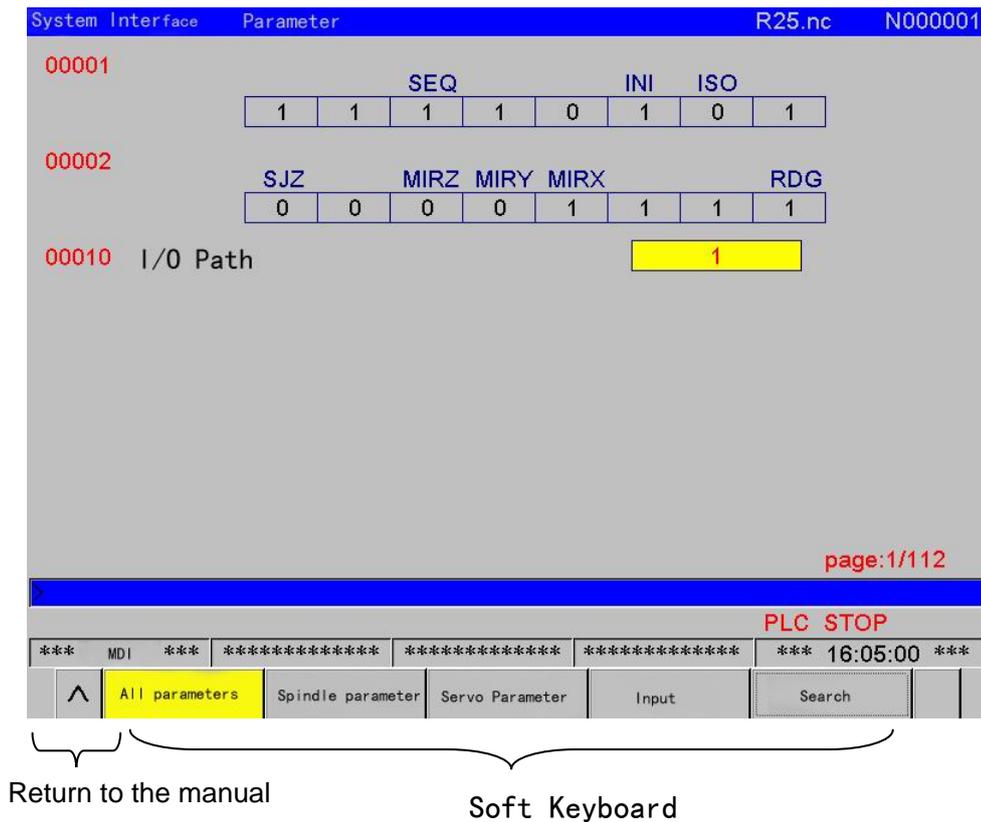
Fig.1-1
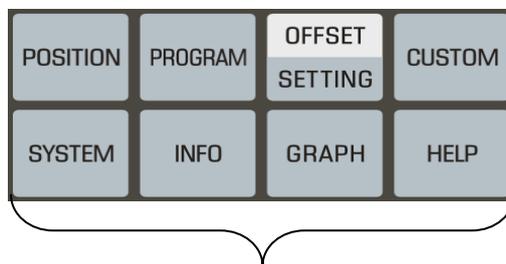
Fig.1-2　Function keys

(2) The parameter screen consists of multiple pages. Use two steps to display the page that contains the parameter you want to display.

(a) The required relative parameters are selected using the soft key, and then the page to be

found by the page keys or cursor move keys.

(b) The parameter numbers to be displayed are input from keyboard, and press the **[search]** softkey to search, then the specified parameter page is displayed, and the cursor is positioned to the specified parameter (the data part is turned into the selected color).

2 Parameter Setting in the Mode of MDI

The operation steps of parameters setting are shown below:

(1) Enter the offset setting page by pressing the OFFSET SETTING, and firstly to input the correspondence password.

To prevent the machining program and CNC parameters from being maliciously modified, the GSK 25i offers an authority setting function and the password can be divided into 9 levels, from the higher to the lower level, such as the 0 level (the system high level), the 1st level (the system service), the 2nd level (the machine manufacturer), the 3rd level (the installation and debugging), the 4th level (the terminal administration), as well as the 5th level (the operator 1 level), the 6th level (the operator 2 level), the 7th level (the operator 3 level) and the lowest default level (see the figure 2-1). The 0 level is enjoys the highest protection; contrarily, the lowest levels are from 5 to 7, and the highest level can be administrated the lowest levels, which is the low authority function. The parameter password level is 3 except for the special explaination.

```
OFT/SET  [Password]                    O0012.nc    N000004

    CNC Adv Pwd      ▓▓▓▓▓▓▓▓    Modify: _____  _____

    CNC Serv Pwd     _____    Modify: _____  _____

    OEM Pwd          _____    Modify: _____  _____

    Field Appli Pwd  _____    Modify: _____  _____

    Superv Pwd       _____    Modify: _____  _____

    Opt #1 Pwd       _____    Modify: _____  _____

    Opt #2 Pwd       _____    Modify: _____  _____

    Opt #3 Pwd       _____    Modify: _____  _____

 |
 * EDIT * |*********|*********|*********|** 02:45:18 **
     | Pitch || LOG  |       |      |Operat| > |
```
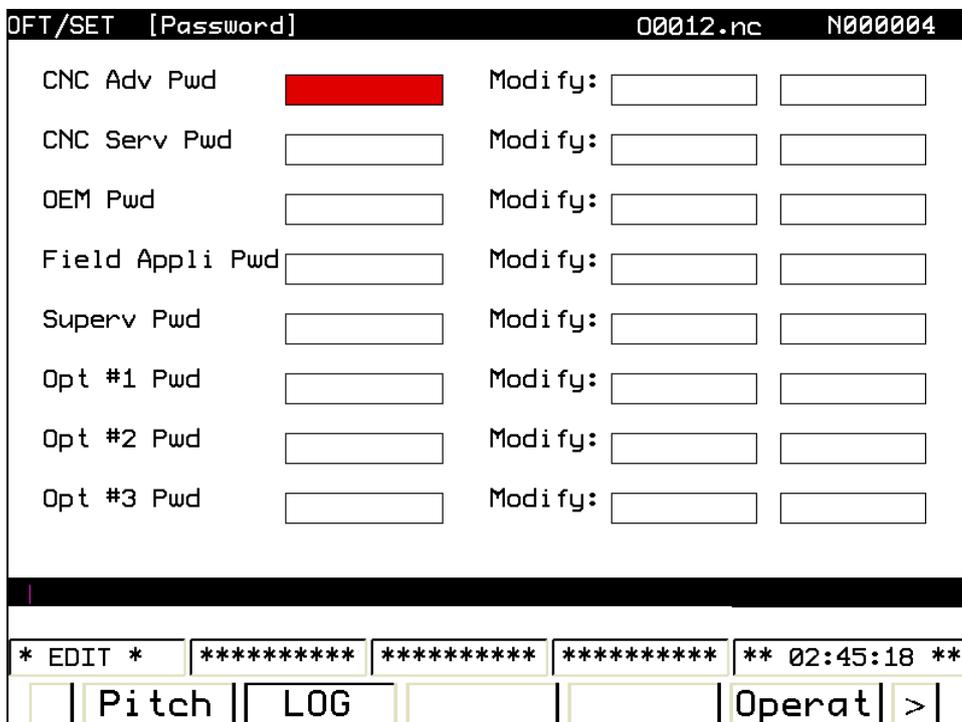
Fig. 2-1

Level 0: the highest authority, reserved by the developer.

Level 1: It is used for the system manufacturer service, which can modified various data.

Level 2: The PLC program, PLC note and the pitch error compensation are modified. The PLC and the pitch error compensation files are input or output. The user customized interface authority is modified/ input or output.

Level 3: The parameter and PLC source data can be modified; the PLC operation is started/stopped; the alarm/operation messages are eliminated; and the files are input or output, and the system, interpolation and positional control maintenance softwares can be upgraded.

Level 4: The program, tool offset, setting, workpiece coordinate system offset and macro program value are modified; these files are input or output and it also has the authority to modify the password.

The 5th, 6th and 7th levels: it is an operation authorized to corresponding person with bit-parameter by the end user administrator.

The lowest level default by the system: it is an authority operation donated with bit-parameter by end user administrator; no password inputs.

The bit-parameter definitions are authorized by the end user administrator, refer to the following table:

Bit	Significance	Note
0	Modify/input or output the authority of G code program.	Authority
1	Modify the authority of geometrical tool offset/input or output tool offset.	Authority
2	Modify the authority of wear tool offset/input or output tool offset.	Authority
3	Modify the authority of setting	Authority
4	Modify/input or output the authority of a workpiece coordinate system offset.	Authority
5	Modify/input or output the authority of a macro program value	Authority
6	Reserved	
7	Reserved	

(2) In the [MDI/Edit] mode, the MDI mode [MDI] and Edit mode [EDIT] can be selected, and the cursor can be moved based on the password authority to the required items.

(3) Press the [INPUT] key, the corresponding level password can be input. If the password is correct, a "correct password" may be displayed in the system; otherwise a "wrong password input" may occur.

(4) After the corresponding parameters are modified, the password is cancelled after logging out.

3 Setting or Maintaining　the System Parameters by PC Instruction Control Unit Software

3.1 Editing of System Parameters

This software can be edited the system parameter on CNC in the program, and the corresponding backup parameter files can be uploaded and downloaded through the internet. (Refer to the Fig. 3-1, Fig. 3-2 and Fig. 3-3)
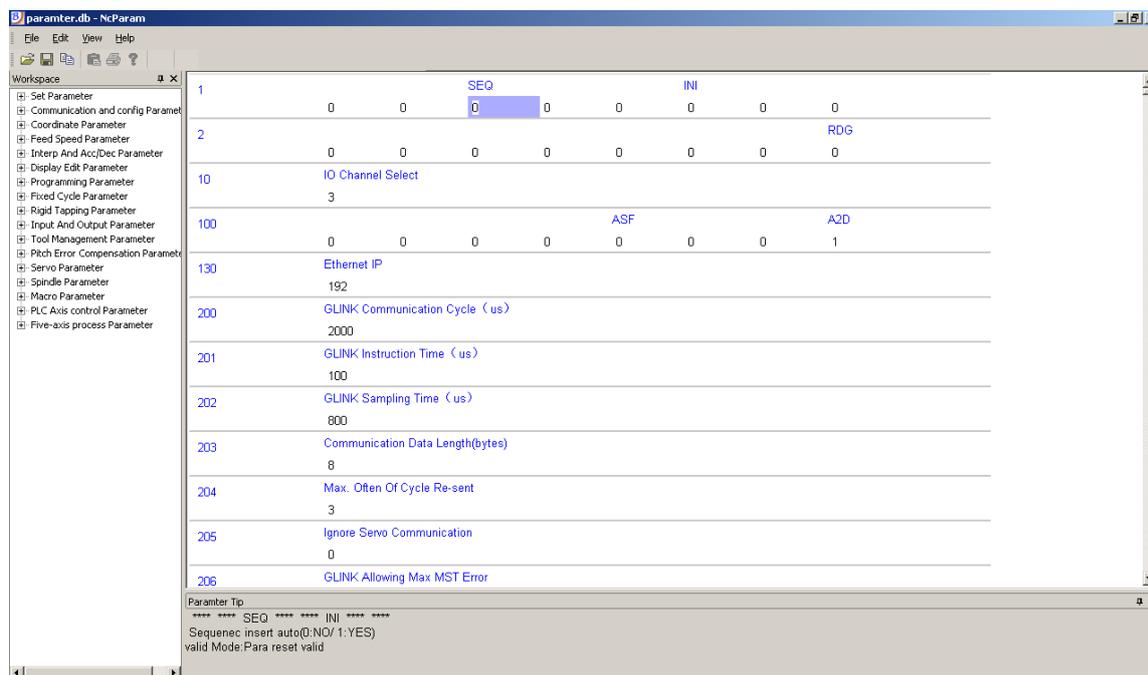
Fig.3-1 Editing the system parameters Ⅰ (Editing of the bit parameters)
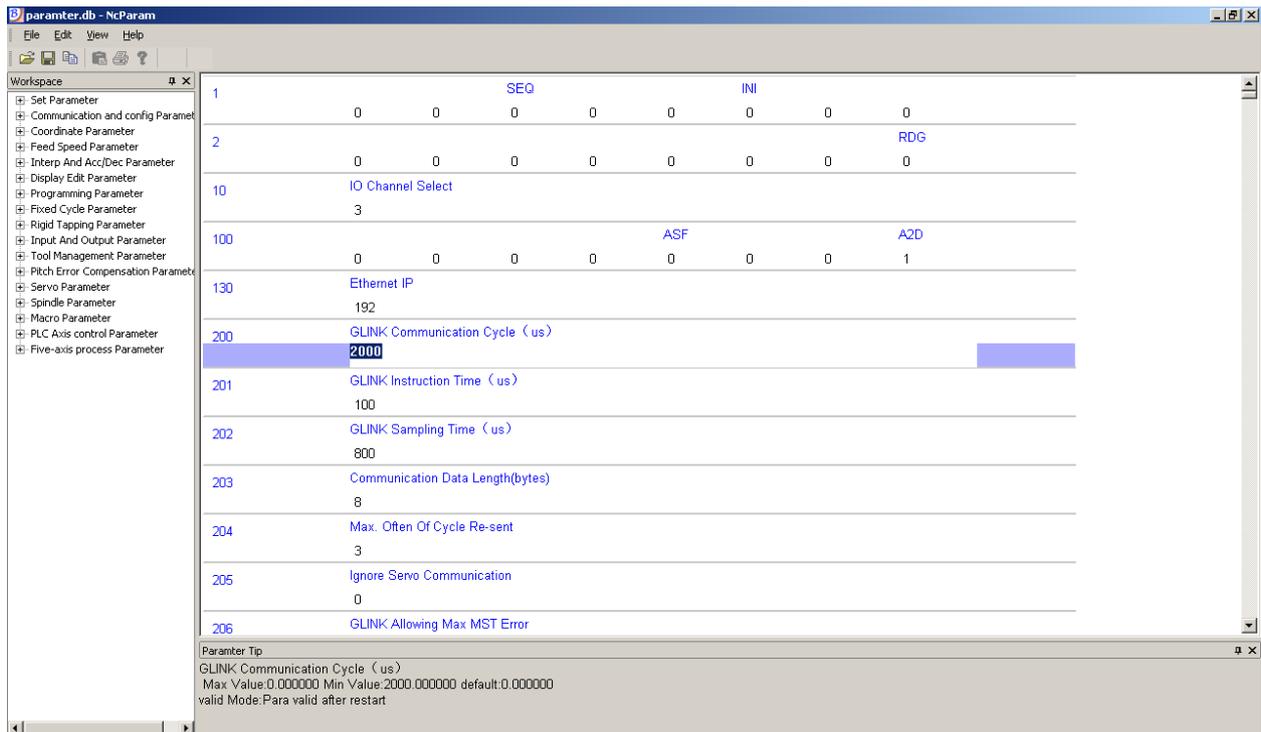
Fig.3-2 Editing the system parameters II (Editing of data parameters)
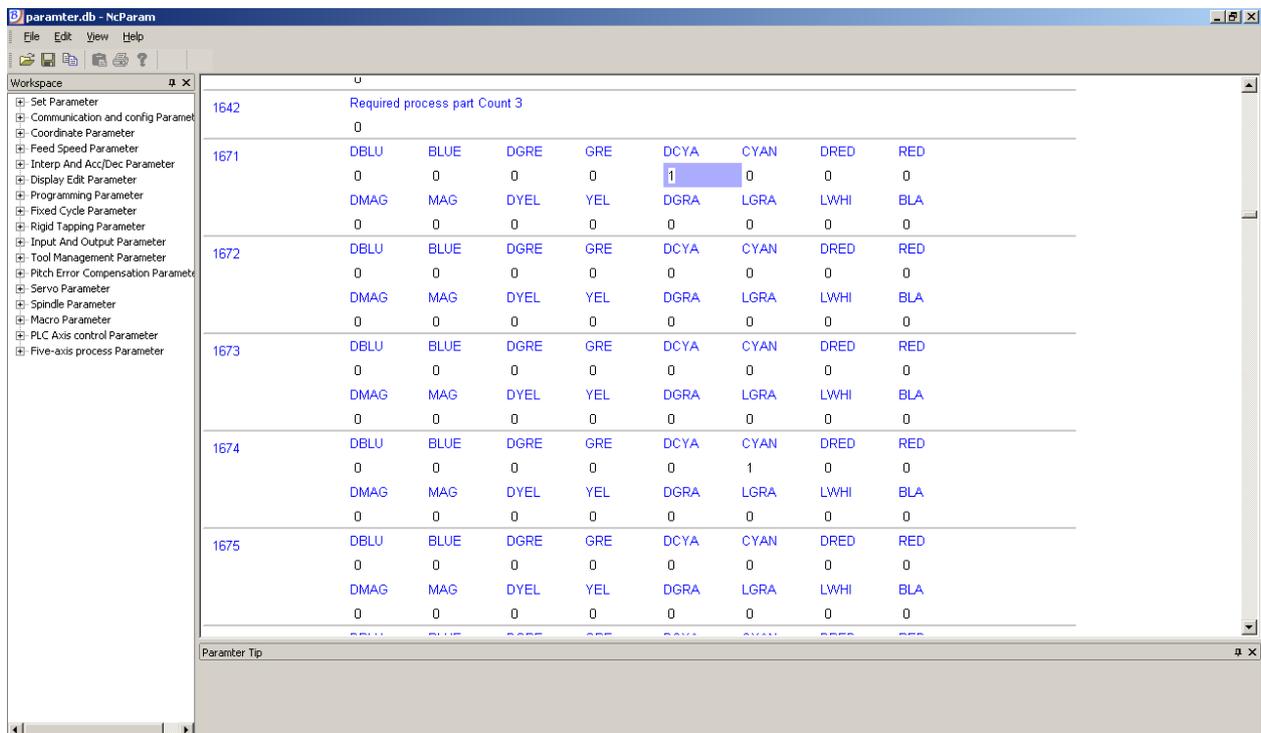
Fig.3-3   Editing the system parameters III (Editing of color parameters)

3.2 Editing of Tool and Offset Parameter

Editing of the tool and offset parameter is as the Fig. 3-4.

| index	Tool Type	Number	Information	life	Max Life	Notify Life	Current Lift Value	Max Lift Value	Notify Life	Current status	Spindle Speed	Feed Speed	Lenght Compensate Number	Nos.
1	112350	11	UBCR	500	2000	20	2000	100000	5000	3	500	70000	2	
2	112350	11	UBCR	500	2000	20	2000	100000	5000	3	500	70000	2	
3	369	11	UBTR	500	2000	20	2000	20000	999999	3	500	70000	2	
4	51	11	UBTR	500	2000	20	3000	100000	5000	3	500	70000	2	
5	112350	11	UBCR	500	2000	20	2000	100000	5000	3	500	70000	2	
6	112350	11	UBCR	500	2000	20	2000	100000	5000	3	500	70000	2	
7	112350	11	UBCR	500	2000	20	2000	100000	5000	3	500	70000	2	
8	112350	11	UBCR	500	2000	20	2000	100000	5000	3	500	70000	2	
9	112350	11	UBCR	500	2000	20	2000	100000	5000	3	500	70000	2	
10	20	11	UBTR	500	2000	20	2000	100000	5000	3	500	70000	2	
11	112350	11	UBCR	500	2000	20	2000	100000	5000	3	500	70000	2	
12	112350	11	UBCR	500	2000	20	2000	100000	5000	3	500	70000	2	
13	52	11	LNC-	700	3000	30	3000	200000	6000	0	900	80000	7	
14	112350	11	UBCR	500	2000	20	2000	100000	5000	3	500	70000	2	
15	112350	11	UBCR	500	2000	20	2000	100000	5000	3	500	70000	2	
16	112350	11	UBCR	500	2000	20	2000	100000	5000	3	500	70000	2	
17	112350	11	UBCR	500	2000	20	2000	100000	5000	3	500	70000	2	
18	112350	11	UBCR	500	2000	20	2000	100000	5000	3	500	70000	2	
19	112350	11	UBCR	500	2000	20	2000	100000	5000	3	500	70000	2	
20	112350	11	UBCR	500	2000	20	2000	100000	5000	3	500	70000	2	
21	112350	11	UBCR	500	2000	20	2000	100000	5000	3	500	70000	2	
22	112350	11	UBCR	500	2000	20	2000	100000	5000	3	500	70000	2	
23	112350	11	UBCR	500	2000	20	2000	100000	5000	3	500	70000	2	
24	112350	11	UBCR	500	2000	20	2000	100000	5000	3	500	70000	2	

Fig. 3-4   Editing of tool and offset parameter

3.3 Editing of the Pitch Error Compensation Data

Editing the pitch error compensation data is as Fig.   3-5.

Index	Postive pitch	Negtive pitch
1	0	0
2	0	0
3	0	0
4	0	0
5	0	0
6	0	0
7	0	0
8	0	0
9	0	0
10	0	0
11	0	0
12	0	0
13	0	0
14	0	0
15	0	0
16	0	0
17	0	0
18	0	0
19	0	0
20	0	0
21	0	0
22	0	0
23	0	0
24	0	0

Fig. 3-5 Editing of the pitch error compensation data

3.4 Editing of PLC Parameter

Editing the PLC parameter is as Fig. 3-6.
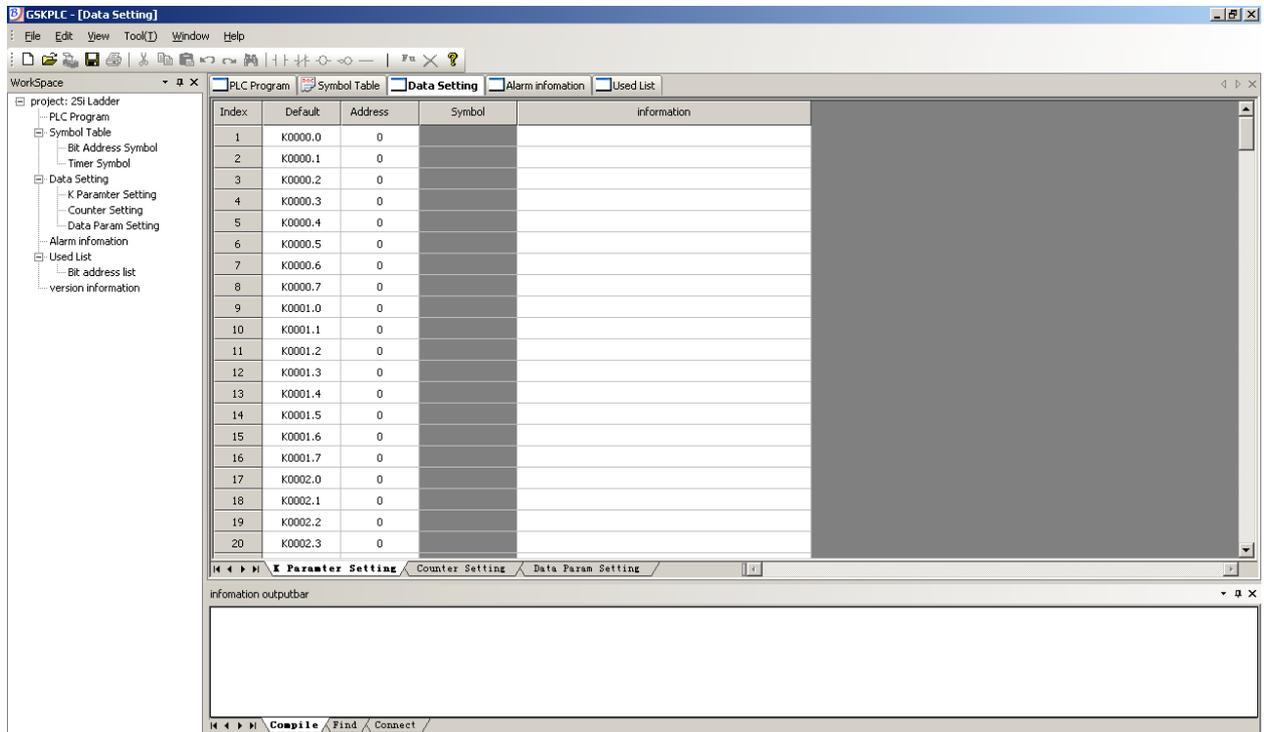
Fig. 3-6 Editing of PLC parameter

4 Parameter Explanation

[Parameter type]

The system parameters can be divided into several types based upon the following parameters (refer to the fig. 4-1).

Table 4-1 data type and data effective range

Data type	Effective data range
Bit	0 or 1
Bit axis	0 or 1
Integrated	－99999999～99999999
Integral axis	－99999999～99999999
Real number	－99999999～99999999
Real number axis	－99999999～99999999

The displayed number of axis type is determined on the total setting axis amount.

[Parameter explanation format]

The system parameter can be defined based on the following format.

Parameter number	Parameter significance explanation

It is important to notice that the cautions may occur in the notice column to remind the user

Note
1. Notice 1
2. Notice 2
3. Notice 3
4,……

4.1 Parameter Setting (1～99)

	7#	6#	5#	4#	3#	2#	1#	0#
0001			SEQ			INI		

[Data type] Bit

[Data range] 0 or 1

INI: Unit of input

0：In mm

1：In inches

SEQ: Automatic insertion of sequence numbers

0：Not performed

1：Performed

> Note:
> The incremental of sequence number is set in parameter No.1621.

[**Standard setting**] 0 0 0 0　0 0 0 0

	7#	6#	5#	4#	3#	2#	1#	0#
0002								RDG

[Data type] Bit

[Data range]　0 or 1

RDG: Remote diagnosis is

0：Not performed

1：Performed

[**Standard setting**] 0 0 0 0　0 0 0 0

0010	I/O CHANNEL selection	3

[Data type] Integrated type

[Data range]　0-4

[**Standard setting**]

Setting value	Significance
0	RS232C serial port
1	Reserved
2	Reserved
3	USB interface
4	Ethernet interface

4.2 Communication Parameter (100～999)

	7#	6#	5#	4#	3#	2#	1#	0#
0100					ASF			A2D

[Data type] Bit type

[Data range]　0 or 1

A2D: DSP loading method

0：DSP directly start mode

1：Loading DSP using cnc program

ASF：The current file of previous one is whether to save automatically while the file is loaded.

0：Yes

1：No

 [**Standard set**]　　0 0 0 0　0 0 0 1

0130	Ethernet IP address	192

[Data type] Integrated type
[Data range] 0-255

> **Note**
> For example: The value of IP:192.168.2.10 is 10 (192.168.2 is a fixed value)

200	GSK-LINK communication period	200000

[Data type] Integrated type
[Data unit] 10ns
[Data range] 10000～1000000(100us-10ms)

201	GSK-LINK command time	10000

[Data type] Integrated type
[Data unit] 10ns
[Data range] 100～1000000

202	GSK-LINK sampling time	80000

[Data type] Integrated type
[Data unit] 10ns
[Data range] 100～1000000

203	The length of period communication data	8

[Data type] Integrated type
[Data unit] Byte
[Data range] 6～16（Required in multiples of 2）

204	The maximum period repeated times	3

[Data type] Integrated type
[Data unit]
[Data range] 0～16

205	Servo communication ignorance	0

[Data type] Integrated
[Dtat unit]
[Data range] 0～1

> **Note:**
> The system may ignore the servo net communication when it is set to
> 1, which is mainly used for debugging; when this parameter is set, the
> power must be turned off before operation is continued.

4.3 Coordinate Parameter (1000～1199)

	7#	6#	5#	4#	3#	2#	1#	0#
1000							ISC	INM

[Data type] Bit
[Data range] 0 or 1

INM: Least command increment on the linear axis

0：In mm (Metric system)

1：In inches (Inch system)

ISC：The least move unit

0：0.001mm, 0.001deg

1：0.0001mm, 0.0001deg

> **Note:**
> When this parameter is set, the power must be turned off before
> operation is continued.

[**Standard setting**]   0 0 0 0 0 0 1 0

	7#	6#	5#	4#	3#	2#	1#	0#
1001						SFD	DLZ	

[Data type] Bit
[Data range] 0 or 1

DLZ: Function setting the reference position without dog

0：Disabled

1：Enabled

SFD: The function for shifting the reference position is

0：Not used

1：Used

[**Standard setting**]   0 0 0 0 0 0 0 0

	7#	6#	5#	4#	3#	2#	1#	0#
1002			EDN	EDP	HJZ			

[Data type] Bit

[Data range] 0 or 1

HJZ: When a reference position is already set:

0: Manual reference position return is performed with deceleration dogs.

1: Manual reference position return is performed using rapid traverse without deceleration dogs.

EDP: External deceleration signal in the positive direction for each axis

0: Valid only for the rapid traverse

1: Valid for rapid traverse and cutting feed

EDN: External deceleration signal in the negative direction for each axis

0: Valid only for rapid traverse

1: Valid for rapid traverse and cutting feed

[**Standard setting**] 0 0 0 0　1 0 0 0

	7#	6#	5#	4#	3#	2#	1#	0#
1004			ZMIx			RRLn		

[Data type] Bit axis

[Data range] 0 or 1

RRLn: Relative coordinates are

0: Not rounded by the amount of the shift per one rotation

1: Rounded by the amount of the shift per one rotation

ZMIx: Reference position return direction is set for each axis

0: In positive

1: In negative

> **Note:**
> When this parameter is set, the power must be turned off before operation is continued.

[**Standard setting**] 0 0 0 0　0 0 0 0

1020	Program axis name for each axis	

[Data type] Integrated axis

[Data range] 0～127

> **Note**
> The display name is ASCII code, and the allowable input values are X-88, Y-89, Z-90, A-65, B-66 and C-67.

1021	The attribute of each axis in the basic coordinate system	

[Data type] Integrated
[Data range] 0～7

Setting value	Significance
0	Neither the basic three axes nor a parallel axis
1	X axis of the basic three axes
2	Y axis of the basic three axes
3	Z axis of the basic three axes
4	Axis parallel to the X axis
5	Axis parallel to the Y axis
6	Axis parallel to the Z axis

1022	Servo logic address for each axis	

[Data type] Integrated
[Data range] 0～25

> **Note**
> The setting of servo logic address is related to the connection of servo network, the 1st slave station connected from the system P1 terminal is 0, according to this, servo logic address is its corresponding set value; Usually, set a same value both the control axis number and the controlled axis number.

	7#	6#	5#	4#	3#	2#	1#	0#
1023							ISR_n	AXU_n

[Data type] Bit axis
[Data range] 0 or 1

   AXU_n: Enabling for each axis is

      0: Not used

      1: Used

   ISR_n: It is either rotation axis or pallel axis for each axis

      0: Pallel axis

      1: Rotation axis

[**Standard setting**] 0 0 0 0   0 0 0 1

	7#	6#	5#	4#	3#	2#	1#	0#
1030	ITI	IDX				ABS	REL	RMOD

[Data type] Bit
[Data range] 0 or 1

   RMOD: G code rotation command movement method

      0: The approximate principle moves to the nearest position

           1: Value magnitude moves

REL: Relative coordinate display of rotation axis

           0: Out of the 360°

           1: Within 360°

ABS: Absolute coordinate display of rotation axis

           0: Out of the 360°

           1: Within 360°

IDX: Index table indexing sequence.

           0: Type A

           1: Type B

ITI: The index function of the index table is:

           0: Disabled

           1: Enabled

[**Standard setting**] 0 0 0 0   0 0 0 0

	7#	6#	5#	4#	3#	2#	1#	0#
1031				G52	RLC			

[Data type] Bit

[Data range]   0 or 1

      RLC: Local coordinate system is

          0: Not cancelled by reset

          1: Cancelled by reset

      G52: In local coordinate system setting, a cutter compensation vector is

          0: Not considered

          1: Considered

 [**Standard setting**]   0 0 0 0 1 0 0 0

1040	External workpiece origin offset value	0

[Data type] Real number axis

[Data unit] mm

[Data range] -9999.9999～9999.9999

1041	The origin offset amount of workpiece coordinate system 1(G54)	0

[Data type] Real number axis

[Data unit] mm

[Data range] -9999.9999～9999.9999

1042	The origin offset amount of workpiece coordinate system 2(G55)	0

[Data type] Real number axis
[Data unit] mm
[Data range] -9999.9999～9999.9999

1043	The origin offset amount of workpiece coordinate system 3(G56)	0

[Data type] Real number axis
[Data unit] mm
[Data range] -9999.9999～9999.9999

1044	The origin offset amount of workpiece coordinate system 4(G57)	0

[Data type] Real number axis
[Data unit] mm
[Data range] -9999.9999～9999.9999

1045	The origin offset amount of workpiece coordinate system 5(G58)	0

[Data type] Real number axis
[Data unit] mm
[Data range] -9999.9999～9999.9999

1046	The origin offset amount of workpiece coordinate system 6(G59)	0

[Data type] Real number axis
[Data unit] mm
[Data range] -9999.9999～9999.9999

1050	Coordinate value of the 1st reference position on each axis in the mechanical coordinate system	0

[Data type] Real number axis
[Data unit] mm
[Data range] -9999.9999～9999.9999

Note:
When this parameter is set, the power must be turned off before operation is continued.

1051	Coordinate value of the 2nd reference position on each axis in the mechanical coordinate system	0

1051	Coordinate value of the 2nd reference position on each axis in the mechanical coordinate system	0

[Data type] Real number axis
[Data unit] mm
[Data range] -9999.9999～9999.9999

> **Note**:
> When this parameter is set, the power must be turned off before operation is continued.

1052	Coordinate value of the 3rd reference position on each axis in the mechanical coordinate system	0

[Data type] Real number axis
[Data unit] mm
[Data range] -9999.9999～9999.9999

> **Note**
> When this parameter is set, the power must be turned off before operation is continued.

1053	Coordinate value of the 4th reference position on each axis in the mechanical coordinate system	0

[Data type] Real number axis
[Data unit] mm
[Data range] -9999.9999～9999.9999

> **Note**
> When this parameter has been set, the power must be turned off before operation is continued.

1060	Amount of a shift per one rotationof a feed axis	0

[Data type] Real number axis
[Data unit] mm or degree
[Data range] 0～999.9999

> **Note**
> When this parameter is set, the power must be turned off before operation is continued.

1068	Amount of rotation angle per one rotation of a revolution axis	360

[Data type] Real number axis
[Data unit] Degree
[Data range] 0～9999.9999

> **Note**
> 1. This parameter is used during cylinderical interpolation.
> 2. When this parameter is set, the power must be turned off before operation is continued.

	7#	6#	5#	4#	3#	2#	1#	0#
1070		LZR	XWG		OT3	OT2		OUT

[Data type] Bit

[Data range] 0 or 1

    OUT: The area inside or outside of the stored stroke check 2 is set as an inhibition area.

        0: Inside

        1: Outside

    OT2: Whether stored stroke check 2 is checked for each axis is set.

        0: Stored stroke check 2 is not checked.

        1: Stored stroke check 2 is checked.

    OT3: Whether stored stroke check 3 is checked for each axis is set.

        0: Stored stroke check 3 is not checked.

        1: Stored stroke check 3 is checked.

    XWG: Overtravel alarm switch

        0: Alarm ON

        1: Alarm OFF

    LZR: Checking of stored stroke check 1 during the time from power-on to the manual reference position return.

        0: Not checked

        1: Checked

[**Standard setting]** 0 0 0 0 0 0 0 0

1080	Coordinate value of stored stroke check 1 in the positive direction on each axis.	999999.9999

[Data type] Real number axis
[Data unit] mm
[Data range] 0～999999.9999

1081	Coordinate value of stroed stroke check 1 in the negative direction on each axis.	-999999.9999

[Data type] Real number axis
[Data unit] mm
[Data range] -999999.9999～0

1082	Coordinate value of stored stroke check 2 in the positive direction on each axis.	999999.9999

[Data type] Real number axis
[Data unit] mm
[Data range] 0～999999.9999

1083	Coordinate value of stored stroke check 2 in the negative direction on each axis.	-999999.9999

[Data type] Real number axis
[Data unit] mm
[Data range] -999999.9999～0

1084	Coordinate value of stored stroke check 3 in the positive direction on each axis.	999999.9999

[Data type] Real number axis
[Data unit] mm
[Data range] 0～999999.9999

1085	Coordinate value of stored stroke check 3 in the negative direction on each axis.	-999999.9999

[Data type] Real number axis
[Data unit] mm
[Data range] -999999.9999～0

1100	Machine struction type	12

[Data type] Integrated
[Data range] 0～21

1101	Controlled axis number of the 1st rotation axis	4

[Data type] Integrated
[Data range] 0～5

1102	The axis direction of the 1st rotation axis	2

[Data type] Integrated
[Data range] 0～5

1103	The rotation direction of the 1st rotation axis	1

[Data type] Integrated
[Data range]   0: negative/ 1: positive

1104	The 1st rotation axis is an inclination angle for angular aixs	0

[Data type] Real number
[Data unit] deg
[Data range] -999999.9999 ~ 999999.9999

1105	The controlled axis number of the 2nd rotation axis	5

[Data type] Integrated
[Data range] 0～5

1106	The axis diretion of the 2nd rotation axis	3

[Data type] Integrated
[Data range] 0～5

1107	The rotation direction of the 2nd rotation axis	1

[Data type] Integrated
[Data range]   0: negative/ 1: positive

1108	The 2nd rotation axis is an inclination angle of the angular axis	0

[Data type] Real number
[Data unit] deg
[Data range] -999999.9999 ~ 999999.9999

1109	The axis direction of tool axis	3

[Data type] Integrated
[Data range] 0~3

1110	The position of index table	0

[Data type]　Real number axis

[Data unit] mm

[Data range] -9999.9999～9999.9999

> **Note**
> Coordinate parameters of three axes X, Y and Z are included

1111	Offset vector between the 1st and 2nd working table rotation axes	0

[Data type]　Real number axis

[Data unit] mm

[Data range] -9999.9999～9999.9999

> **Note**
> Coordinate parameters of three axes X, Y and Z are included

1112	Offset vector between the tool axis and tool rotation axis	0

[Data type]　Real number axis

[Data unit] mm

[Data range] -9999.9999～9999.9999

> **Note**
> Coordinate parameters of three axes X, Y and Z are included

1113	Offset vector between the 2nd and 1st tool rotation axes	0

[Data type]　Real number axis

[Data unit] mm

[Data range] -9999.9999～9999.9999

> **Note**
> Coordinate parameters of three axes X, Y and Z are included

1114	Tool post offset	0

[Data type]　Real number axis

[Data unit] mm

[Data range] -9999.9999～9999.9999

4.4 Feedrate Parameter (1200～1399)

1200	7#	6#	5#	4#	3#	2#	1#	0#
1200		RDR		RF0				RPD

[Data type] Bit

[Data range] 0 or 1

RPD: Manual rapid traverse during the period from the power-on time to the completion of the reference position return.

0: Disabled

1：Enabled

RF0: When the rapid feedrate override is F0,

0: The machine tool does not stop moving.

1: The machine tool stops moving.

RDR: When the rapid traverse is performed,

0: Dry run is disabled.

1: Dry run is enabled.

[**Standard setting]** 0 0 0 0   0 0 0 0

1210	Dry run speed (common to all axes)	10000

[Data type] Real number

[Data unit] mm/min

[Data range] 0～1000000

> **Note**
> The dry run speed is set when the manual feedrate is set to 100%.

1211	The cutting feedrate occurs by default in the automatic mode	1000

[Data type] Real number

[Data unit] mm/min

[Data range] 0～1000000

> **Note**
> The feedrate is set when the automatic feedrate is set to 100%.

1224	The maximum cutting composite feedrate (common to all axes)	4000

[Data type] Real number

[Data unit] mm/min

[Data range] 0～1000000

1225	Maximum cutting feedrate for each axis in the automation mode	4000

[Data type] Real number axis
[Data unit] mm/min or degree/min
[Data range] 0～1000000

1226	Rapid traverse rate for each axis in the automation mode	10000

[Data type] Real number axis
[Data unit] mm/min or degree/min
[Data range] 0～1000000

Note
1. The rapid traverse rate is set when the rapid traverse rate is set to 100%.

1227	The top allowable speed of move axis is shown when it is started or stopped suddenly during the linkage.	1000

[Data type] Real number axis
[Data unit] mm/min or degree/min
[Data range] 0～1000000

1228	The top allowable speed of move axis is shown when it is performed in negative suddenly during the linkage.	1000

[Data type] Real number axis
[Data unit] mm/min or degree/min
[Data range] 0～1000000

1**229**	The top allowable acceleration speed of move axis is shown when it is performed in negative suddenly during the linkage.	0.3 [The rotation axis is 75]

[Data type] Real number axis
[Data unit] m/s^2
[Data range] 0～90000000

1231	F0 speed of rapid traverse feedrate override (common to all axes)	100

[Data type] Real number
[Data unit] mm/min or degree/min
[Data range] 0～100000

1232	Feedrate in manual continuous feed (JOG feed) for each axis	1000

[Data type] Real number axis
[Data unit] mm/min or degree/min
[Data range] 0～100000

Note
JOG feedrate is set when manual feedrate is 100%.

1233	Manual rapid traverse rate for each axis	3000

[Data type] Real number axis
[Data unit] mm/min or degree/min
[Data range] 0～100000

Note
1. Rapid traverse rate is set when the rapid traverse rate is 100%, and the value set by No.1226 [the top speed at rapid traverse rate] is employed when this parameter is set to 0.

1234	FL rate of the reference position return for each axis	300

[Data type] Real number axis
[Data unit] mm/min or degree/min
[Data range] 0~15000

1235	Reference position return speed for each axis	4000 [the rotation axis is 2000]

[Data type] Real number axis
[Data unit] mm/min or degree/min
[Data range] 0～100000

1236	The 2nd FL speed of reference position return for each axis	7 [The rotation axis is 2]

[Data type] Real number axis
[Data unit] mm/min or degree/min
[Data range] 0～100000

1239	The top speed of manual feed	5000

[Data type] Real number
[Data unit] mm/min or degree/min
[Data range] 0～100000

1240	The maximum operation speed of single-step	10000

[Data type] Real number
[Data unit] mm/min or degree/min
[Data range] 0～100000

1241	The maximum feed speed of MPG	15000

[Data type] Real number
[Data unit] mm/min or degree/min
[Data range] 0～100000

4.5 Interpolation and Acceleration/Deceleration Control Parameter (1400～1599)

	7#	6#	5#	4#	3#	2#	1#	0#
1400		PACD			PPCK			

[Data type] Bit
[Data range]　0 or 1
　　　PPCK: In-position check
　　　　　0: Not performed
　　　　　1: Performed
　　　PACD: The acceleration/deceleration mode before the interpolation
　　　　　0: Linear type
　　　　　1: Type S

[**Standard setting]** 0 0 0 0　0 0 0 0

	7#	6#	5#	4#	3#	2#	1#	0#
1401	ALS	WFM		DEF			EFL	

[Data type] Bit

[Data range] 0 or 1

        EFL: The flag of the transition of small line segment fold

            0: No employed

            1: Employed

        DEF: The speed is whether to control the speed variable when the controlled axis is stopped suddenly

            0: Not considered

            1: Considered

        WFM: MPG interpolation mode

            0: It is treated by the impounding reservoir mode

            1: It is treated by the real-time mode

        ALS: Automatic corner feed function

            0: Invalid

            1: Valid

[**Standard setting**] 0 0 0 0 0 0 0 0

	7#	6#	5#	4#	3#	2#	1#	0#
1403			RCOK	RBK			HXS	

[Data type] Bit

[Data range] 0 or 1

        HXS: The rotation diretion between MPG and each axis

            0: Different

            1: Same

        RBK: The backlash compensation is performed between the cutting and rapid traverse.

            0: Not separately

            1: Separately

        RCOK: Backlash compensation

            0: Not performed

            1: Performed

[**Standard setting**] 0 0 0 0 0 0 1 0

1404	Curve frequency of Nurbs interpolation	3

[Data type] Integrated

[Data unit] times

[Data range] 1～4

1405	Standard indensity setting of Nurbs curve interpolation	10

[Data type] Integrated
[Data unit] Point/mm
[Data range] 5～1000

1406	Pre-read sections in its look-ahead treatment	1000

[Data type] Integrated
[Data unit] Section
[Data range] 0～2000

1407	The maximum program sections of Nurbs curve interpolation	200

[Data type] Integrated
[Data unit] Section
[Data range] 10～500

1409	Prospective treatment program section amount	10

[Data type] Integrated
[Data unit] Section
[Data range] 0～2000

Note
The prospective program section amount is set when adopting the prospect, and the 0 does not indicate prospect.

1410	Acceleration/deceleration type S and time constant T1 are specified before the rapid traverse feed is performed	100

[Data type] Integrated axis
[Data unit] ms
[Data range] 1～4000

The parameter value of its corresponding number is indicated by the P+ parameter number, such as, PA1233 means the No. 1233 parameter. The acceleration/deceleration calculation mode of type S is shown below, where, the t_1 indicates an uniform acceleration time, t_2 means a jerk and decelerating acceleration time, and A_m is the maximum acceleration.
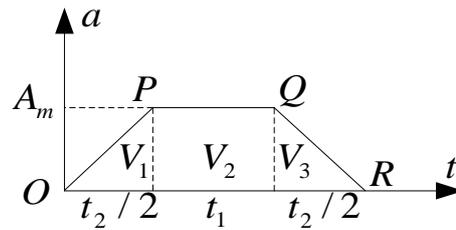
As the above figure mentioned, the ladder area is:
$$V_m = \frac{(t_1 + t_1 + t_2) * A_m}{2}$$

The maximum acceleration calculation is concluded:
$$A_m = \frac{V_m}{(2t_1 + t_2)}$$

And, the calculation of jerk time is:
$$J_m = \frac{2A_m}{t_2}$$

The linear acceleration/deceleration can be regarded as a special example when the type S acceleration/deceleration is on the state of $t_2 = 0$.

Before the Goo rapid traverse, the maximum acceleration calculation format of acceleration/deceleration type S is:

$$A_{m00} = \frac{2 \times P_{1226}}{(2 \times P_{1410} + P_{1411})}$$, And the maximum acceleration calculation format of jerk type

S before the Goo rapid traverse is $$J_{m00} = \frac{2A_{m00}}{P_{1411}}$$.

Note

1. When the acceleration or jerk calculation is used this format during the actual application; it is very necessary to note that the unit conversion must be performed in terms of the unit of parameters.

1411	S-type acceleration/deceleration time constant T_2 at the rapid traverse feed	100

[Data type] Integral axis
[Data unit] ms
[Data range] 0~4000

Note

1. When the acceleration or jerk calculation is used this format during the actual application; it is very necessary to note that the unit conversion must be performed in terms of the unit of parameters.

1440	The maximum acceleration speed	0.4 [The rotation axis is 100]

[Data type] Real number axis

[Data unit] m/ s^2, the rotation axis is: degree/s^2, a general rotation axis value is up to 250 folds related to the parallel axis.

[Data range] 0～25000

Note
It is only valid to the linear acceleration/deceleration control.

1442	The maximum acceleration speed of the circular arc interpolation feed	0.5

[Data type] Real number

[Data unit] m/ s^2

[Data range] 0～25000

1444	Mechanical zero return acceleration speed by default	0.139[The rotation axis is 80]

[Data type] Real number axis

[Data unit] m/s^2, the rotation axis is: degree/s^2, a general rotation axis value is up to 250 folds related to the parallel axis.

[Data range] 0～25000

1445	The acceleration speed is performed during deceleration when dwelling or RESETTING in the process of operation	0.5

[Data type] Real number

[Data unit] m/ s^2

[Data range] 0～25000

1446	MPG acceleration speed	0.5

[Data type] Real number

[Data unit] m/s^2

[Data range] 0～25000

1447	Manual acceleration speed	0.5

[Data type] Real number

[Data unit] m/s^2

[Data range] 0～25000

1471	Cutting feed in-position accuracy	0.001

[Data type] Real number
[Data unit] mm
[Data range] 0～1

1472	Circular arc interpolation control accuracy	0.001

[Data type] Real number
[Data unit] mm
[Data range] 0～1

1473	The maximum contour error of the system	0.001

[Data type] Real number
[Data unit] mm
[Data range] 0～1

1480	The acceleration/deceleration S-type time constant T1 before cutting feed	16

[Data type] Integral axis
[Data unit] ms
[Data range] 0～4000

The maximum acceleration calculation format of acceleration/deceleration type S before the Goo rapid traverse is:

$$A_{m01} = \frac{2 \times P_{1225}}{(2 \times P_{1480} + P_{1481})}$$, and the maximum jerk calculation format of

acceleration/deceleration type S before the Goo rapid traverse is $J_{m01} = \frac{2A_{m01}}{P_{1481}}$.

Note

1. When the acceleration or jerk calculation is used this format during the actual application; it is very necessary to note that the unit conversion must be performed in terms of the unit of parameters.

1481	Accleration/deceleration S type time constant T2 before cutting feed	16

[Data type] Integral axis
[Data unit] ms
[Data range] 0～4000

| **Note** |
| 1. When the acceleration or jerk calculation is used this format during the actual application; it is very necessary to note that the unit conversion must be performed in terms of the unit of parameters. |

| **1493** | Judging the least distance of Nurbs interpolation deceleration point | 1. 000 |

[Data type] Real number
[Data unit] mm
[Data rang] 0～50.0000mm

| **1494** | Judge the least corner of Nurbs interpolation deceleration point | 10 |

[Datat type] Real number
[Data unit] deg
[Data range] 0～30

| **1495** | The least conversion corner of fold line transition | 150 |

[Datat type] Real number
[Data unit] deg
[Data range] 120~180

| **1500** | Two blocks' boundary corner of the automatic corner deceleration | 0 |

[Datat type] Real number
[Data unit] deg
[Data range] 0~60

| **1501** | The lowest federate of automatic corner deceleration | 120 |

[Datat type] Real number
[Data unit] mm/min
[Data range] 60～1000

| **1502** | The least circular arc cutting feed deceleration rate inside the automatic corner override | 50 |

[Datat type] Real number
[Data unit] ％
[Data range] 0.00～100.00

1503	The start distance of the internal corner override	1

[Datat type] Real number
[Data unit] 0.1mm
[Data range] 0～4000

1504	The end distance of the internal corner override	1

[Datat type] Real number
[Data unit] 0.1mm
[Data range] 0～3999

1505	The lowest speed of circular interpolation	200

[Datat type] Real number
[Data unit] mm/min
[Data range] 0～9999.9999

4. 6 Editing Parameter Display (1600～1799)

	7#	6#	5#	4#	3#	2#	1#	0#
1601			ENG	CHI				

[Data type] Bit
[Data range] 0 or 1

ENG, CHI: Language selection

ENG	CHI	**Language display**
0	*	**Simplified Chinese**
1	0	**English**

[**Standard setting]** 0 0 0 1　0 0 0 0

	7#	6#	5#	4#	3#	2#	1#	0#
1603	DAC	DAL	DRC	DRL				

[Data type] Bit
[Data range] 0 or 1

DRL: The relative position display is whether to consider the tool length compensation

    0: Considered

    1: Not considered

DRC: The relative position display is whether to consider the tool radius compensation

    0: Considered

    1: Not considered

DAL: The absolute position display is whether to consider the tool length compensation

    0: Considered

    1: Not considered

DAC: The absolute position display is whether to consider the tool radius compensation

    0: Considered

    1: Not considered

[**Standard setting**] 0 0 0 0   0 0 0 0

	7#	6#	5#	4#	3#	2#	1#	0#
1605		NPA						PLCD

[Data type] Bit

[Data range] 0 or 1

PLCD: PLC ladder diagram display

    0: Not displayed

    1: Displayed

NPA: Whether to shift to an alarm screen when the alarm occurs.

    0: No

    1: Yes

[**Standard setting**] 0 0 0 0   0 0 0 1

	7#	6#	5#	4#	3#	2#	1#	0#
1610				NE9				NE8

[Data type] Bit

[Data range] 0 or 1

NE8: Whether to forbid the subprogram edit of the program numbers from 8000 to 8999

    0: Not forbidden

    1: Forbidden

NE9: Whether to forbid the subprogram edit of the program numbers from 9000 to 9999

    0: Not forbidden

    1: Forbidden

 [**Standard setting**] 0 0 0 1   0 0 0 1

1621	Automatically insert the incremental value in sequence number	10

[Data type] Integrated

[Data range] 0～9999

1640	The required machining parts are added 1	0

[Data type] Integrated

[Data range] 0～99999999

1641	The required machining parts are added 2	0

[Data type] Integrated
[Data range] 0～99999999

1642	The required machining parts are added 3	0

[Data type] Integrated
[Data range] 0～99999999

1671	Main surface ground colour	

[Data type] Bit

1672	Fixed output color	

[Data type] Bit

1673	Dynamic output color	

[Data type] Bit

1674	Selected basis color	

[Data type] Bit

1675	Selected font color	

[Data type] Bit

1676	The ground color of controllable parts	

[Data type] Bit

1677	The selected color of controllable parts	

[Data type] Bit

1678	The ground color of input column	

[Data type] Bit

1679	The font color of input column	

[Data type] Bit

1680	The ground color of title column	

[Data type] Bit

1681	The font color of title column	

[Data type] Bit

1682	The ground color of state column	

[Data type] Bit

1683	The font color of state column	

[Data type] Bit

1684	Alarm color	

[Data type] Bit

1685	Setting-out color	

[Data type] Bit

1686	Shared color	

[Data type] Bit

	7#	6#	5#	4#	3#	2#	1#	0#
1687						DEF3	DEF2	DEF1

[Data type] Bit
[Data range] 0 or 1

> **Note**
> DEF1-DEF3, the default color configuration program, the above-mentioned configuration color can be regarded as valid as long as all default bits are set to 0.

4. 7 Programming Parameter (1800～1999)

1800	7#	6#	5#	4#	3#	2#	1#	0#
								DPI

[Data type] Bit

[Data range] 0 or 1

DPI: The decimal point is ignored when programming

0: It is treated as the least set unit

1: It is regarded as mm, sec

[**Starndard setting]** 0 0 0 0   0 0 0 1

1801	7#	6#	5#	4#	3#	2#	1#	0#
	G23	CLR			G91	G19	G18	G01

[Data type] Bit

[Data range] 0 or 1

G01: The modul issues when the power is turned on or off

0: G00 mode

1：G01 mode

G18, G19: When the power is turned on or off, the panel selection is:

G19	G18	Panel selection
0	0	G17
0	1	G18
1	0	G19

G91: When the power is turned on or off, its set is:

0: G90 mode

1: G91 mode

CLR: When the reset is performed

0: The system is reset

1: The system is eliminated

G23: When the power is turned on

0: G22 mode

1: G23 mode

[**Standard setting]** 1 0 0 0   0 0 0 0

1802	7#	6#	5#	4#	3#	2#	1#	0#
		AD2						

[Data type] Bit

[Data range] 0 or 1

AD2: More than two same addresses are specified in a same command.

0: Command is valid

1: System alarm

[**Standard set]** 0 0 0 0   0 0 0 0

	7#	6#	5#	4#	3#	2#	1#	0#
1803		M3B					POL	

[Data type] Bit

[Data range] 0 or 1

POL: Decimal point command address program

0: Used

1: Not used

M3B: M code number can be specified in program

0: One

1: Up to 3

[**Standard setting**] 0 1 0 0   0 0 0 0

1810	Allowable error of circular arc radius	0.01

[Data type] Real number

[Data unit] mm

[Data range] 0～9999.9999

> **Note**
> The circular arc radius error is not to be checked when the set value is 0.

	7#	6#	5#	4#	3#	2#	1#	0#
1850	SCR	XSC			SCL			RIN

[Data type] Bit

[Data range] 0 or 1

RIN: The rotation angle of its coordinate rotation

0: Absolute coordinate command

1: G90/G9 command

SCL: Scaling for each axis

0: Disabled

1：Enabled

XSC: Scaling override for each axis

0: Disabled

1：Enabled

SCR: The scaling override unit

0: 0.001 times

1: 0.0001 times

[**Standard setting**] 0 0 0 0   0 0 0 0

1860	The rotation angle is used when the angle in coordinate rotation does not occur.	0

[Data type] Real number
[Data unit] deg
[Data range] -360.000～ 360.000

1861	The scaling override is used when the scaling command override does not occur.	1

[Data type] Real number
[Data range] 0～ 99.999

1862	Scaling for each axis	1

[Data type] Real number axis
[Data range] 0～ 99.999

	7#	6#	5#	4#	3#	2#	1#	0#
1870							PDI	MDL

[Data type] Bit
[Data range] 0 or 1

    MDL: Single direction positioning G code (G60)

        0: The modul code does not set

        1: Modul code

    PDI: Single direction positioning in-position check

        0: Not performed

        1: Performed

[**Standard set]** 0 0 0 0 0 0 0 0

1880	The direction and overtravel amount of single direction positioning for each axis	0

[Data type] Real number axis
[Data unit] mm
[Data range] -999.9999～ 999.9999

1931	The least angle of index table	0

[Data type] Real number
[Data unit] deg
[Data range] 0～360.000

	7#	6#	5#	4#	3#	2#	1#	0#
1940	SKF							

[Data type] Bit

[Data range] 0 or 1

      SKF: Whether the G31 skip command is valid to the dry run, override and authomatic acceleration/deceleration:

         0: Valid

         1: Invalid

[**Standard set]** 0 0 0 0   0 0 0 0

	7#	6#	5#	4#	3#	2#	1#	0#
1950	MOU							

[Data type] Bit

[Data range] 0 or 1

      MOU: Whether to input the M, S, T and B codes when the program is restarted:

         0: Not output

         1: Output

[**Standard set]** 0 0 0 0   0 0 0 0

1960	The move sequence for each axis moves to the program restart position	

[Data type] Integral axis

[Data range] 0～ Controllable axis number

	7#	6#	5#	4#	3#	2#	1#	0#
1971	ESC	ESR						

[Data type] Bit

[Data range] 0 or 1

      ESR: External program number index

         0: Ineffective

         1: Effective

      ESC: The reset is input from ESTB input to index.

         0: Index performed

         1: Not performed

 [**Standard set]** 0 0 0 0   0 0 0 0

4.8 Fixed Cycle Parameter (2000～2099)

	7#	6#	5#	4#	3#	2#	1#	0#
2000		M5B	RD2	RD1				FXY

[Data type] Bit

[Data range] 0 or 1

FXY: The drilling axis in the drilling canned cycle is:

0: Always the Z-axis

1: The axis selected by the program

RD2, RD1　Set the retraction axis direction of G76 or G87

RD2	RD1	G17	G18	G19
0	0	+X	+Z	+Y
0	1	-X	-Z	-Y
1	0	+Y	+X	+Z
1	1	-Y	-X	-Z

M5B: G76 G87 spindle orientation

0: Outputs M05 before an orientated spindle stops

1: Not ouput M05 before an oriented spindle stops

[**Standard setting**] 0 0 0 0　0 0 0 0

2010	Return d of high speed peck drilling G73	0.5

[Data type] Real number

[Data unit] mm

[Data range] 0～99.9999

2011	Clearance d of canned cycle G83	0.5

[Data type] Real number

[Data unit] mm

[Data range] 0～99.9999

2034	Clearance of small diameter peck drilling cycle	0.5

[Data type] Real number

[Data unit] mm

[Data range] 0～99.9999

4.9 Rigid Tapping Parameter (2100～2299)

2112	Return or clearance in peck tapping cycle	0.5

[Data type] Real number
[Data unit] mm
[Data range] 0～99.9999

2140	The maximum speed of spindle (the 1st step gear) in rigid tapping	1000

[Data type] Integrated
[Data unit] r/min
[Data range] 0～9999

2141	The maximum speed of spindle (the 2nd step gear) in rigid tapping	1000

[Data type] Integrated
[Data unit] r/min
[Data range] 0～9999

2142	The maximum speed of spindle (the 3rd step gear) in rigid tapping	1000

[Data type] Integrated
[Data unit] r/min
[Data range] 0～9999

2170	The position control circuit gain is performed (the 1st step gear) between spindle and tapping axis when the rigid tapping is performed.	1000

[Data type] Integrated
[Data unit] 0.01/s
[Data range] 0～9999

Note
When this parameter is set, the power must be turned off before operation is continued.

2171	The position control circuit gain is performed (the 2nd step gear) between spindle and tapping axis when the rigid tapping is performed.	1000

[Data type] Integrated
[Data unit] 0.01/s

[Data range] 0～9999

> **Note**
> When this parameter is set, the power must be turned off
> before operation is continued.

2172	The position control circuit gain is performed (the 3rd step gear) between spindle and tapping axis when the rigid tapping is performed.	1000

[Data type] Integrated
[Data unit] 0.01/s
[Data range] 0～9999

> **Note**
> When this parameter is set, the power must be turned off before
> operation is continued.

2180	Spindle circuit gain coefficient in rigid tapping (the 1st step gear)	1000

[Data type] Integrated
[Data range] 0～32767

2181	Spindle circuit gain coefficient in rigid tapping (the 2nd step gear)	1000

[Data type] Integrated
[Data range] 0～32767

2182	Spindle circuit gain coefficient in rigid tapping (the 3rd step gear)	1000

[Data type] Integrated
[Data range] 0～32767

2210	Spindle backlash compensating value of rigid tapping (the 1st step gear)	10

[Data type] Integrated
[Data unit] Check unit
[Data range] 1～127

2211	Spindle backlash compensating value of rigid tapping (the 2nd step gear)	10

[Data type] Integrated

[Data unit] Check unit
[Data range] 1～127

2212	Spindle backlash compensating value of rigid tapping (the 3rd step gear)	10

[Data type] Integrated
[Data unit] Check unit
[Data range] 1～127

2221	Return value of rigid tapping	0.5

[Data type] Real number
[Data unit] mm
[Data range] 0～9999.9999

4.10 Parameter of Manual, Auto and MPG Operation (2300～2499)

	7#	6#	5#	4#	3#	2#	1#	0#
2300	HNGD		JAG	HPF	HCL	IHD		JHD

[Data type] Bit
[Data range] 0 or 1

    JHD: MPG feed in JOG mode or incremental feed in MPG feed mode

        0: Invalid

        1: Valid

    IHD: The travel increment of MPG is:

        0: Output unit

        1: Input unit

    HCL: Whether the softkey is cleared the display of MPG interruption

        0: Disabled

        1: Enabled

    HPF: When a MPG feedrate exceeding the rapit traverse rate is issued, the rate is clamped at the rapid traverse rate and exceeded part of pulse

        0: Ignored

        1: Not ignored, but stored in the CNC

    JAG: Manual absolute switch of system

        0: OFF

        1: ON

    HNGD: Axis movement direction for rotation direction of MPG

        0: Same in direction

        1: Reverse in direction

 [**Standard setting**] 0 0 0 0　0 0 0 0

2310	Least command increment setting for JOG feed	0.001

[Data type] 2-word
[Data unit] mm
[Data range] 0～10.000

2320	Number of MPG	

[Data type] Byte
[Data range] 1～3

2321	MPG feedrate override m	

[Data type] Byte
[Data range] 1～127

2322	MPG feedrate override n	

[Data type] Word
[Data range] 1～999

MP2(G19#5)	**MP1(G19#4)**	**MPG movement**
0	0	Least input increment ×1
0	1	Least input increment ×10
1	0	Least input increment ×m
1	1	Least input increment ×n

2323	Allowable number of pulses that can be accumulated during MPG feed	

[Data type] 2-Word
[Data range] 0～99999999

4.11 Parameter (2500～2599) Input/Output

	7#	6#	5#	4#	3#	2#	1#	0#
2501	LTM		DEC		SWI			

[Data type] Bit
[Data range] 0 or 1

    SWI: Position switch symbol

       0: Invalid

       1: Valid

    DEC: Deceleration signal for reference position return

0: Deceleration is applied when the signal is 0.

1: Deceleration is applied when the signal is 1.

LTM: Hard limit treatment method

0: Hard limit deceleration treatment

1: Stops immediately

[**Standard setting**] 0 0 0 0   0 0 0 0

2510	The delay time of strobe signal MF, SF, TF and BF	64

[Data type] Integrated
[Data unit] ms
[Data range] 16～32767

2511	The acceptable width of the M, S, T and B completion signal	64

[Data type] Integrated
[Data unit] ms
[Data range] 16～32767

2512	Distributed address to the skip signal	0

[Data type] Integrated
[Data range] 0～127

Note
1. It is invalid when the parameter is less than 10.

2513	Distributed address to the measure arrival signal	0

[Data type] Integrated
[Data range] 0～127

Note
1. It is invalid when the parameter is less than 10.

2518	Output time of reset signal	100

[Data type] Integrated
[Data unit] ms
[Data range] 0～1000

2540-2555	Position switch corresponds servo axis	0

[Data type] Integrated

[Data range] 0～6

Note

1. Position switch function is valid when the bit SWI is set to 1.

2. Position switch function is invalid when the bit SWI is set to 0.

2556-2571	The maximum range of position switch positive	0

[Data type] Integrated

[Data range] 0～99999999

2572-2587	The maximum range of position switch negative	0

[Data type] Integrated

[Data range] -99999999～ 0

4.12 Tool Administration Parameter (2600～2799)

	7#	6#	5#	4#	3#	2#	1#	0#
2600							TLB	

[Data type] Bit

[Data range] 0 or 1

TLB: Tool length compensation selection

0: Tool compensation A (Always Z axis irrespective of plane specification)

1: Tool compensation B (Axis perpendicular to plane specification)

[**Standard setting]** 0 0 0 0　0 0 1 0

	7#	6#	5#	4#	3#	2#	1#	0#
2601	ODI	LVK				CCN		

[Data type] Bit

[Data range] 0 or 1

CCN: G28 command moves to the intermediate point in radius compensation

0: The radius compensation is cancelled in movement to an intermediated position

1: The radius compensation is not cancelled in movement to an intermediate position, but is cancelled in movement to the reference position.

LVK: Tool length offset value

0: Not cleared, but held by reset

1: Cleared by reset

ODI: A cutter compensation amount is set using:

0: A diameter

1: A radius

[**Standard setting**] 0 0 0 0　0 1 0 0

	7#	6#	5#	4#	3#	2#	1#	0#
2602			G39			TPH	CNI	OIM

[Data type] Bit

[Data range] 0 or 1

OIM: When the unit is switched between the inch and metric systems, automatic tool offset value conversion is:

0: Not performed

1: Performed

CNI: Interference check for radius compensation is:

0: Performed

1: Not performed

TPH: Tool format of cutter compensation

0: Type A

1: Type B

G39: The corner rounding function in radius compensation mode is:

0: Disabled

1: Enabled

[**Standard setting**] 0 0 0 0　0 0 0 0

2610	The vector limit value is ignored when cutter compensation moves along with the corner external.	10

[Data type] Real number

[Data unit] mm

[Data range] 0～99.9999

2611	The maximum amount of tool wear compensation value	60

[Data type] Real number

[Data unit] mm

[Data range] 0～99.9999

2651	Automatic tool length compensation measure speed	1000

[Data type] Real number

[Data unit] mm/min

[Data range] 0～15000

2652	The r value of automatic tool length compensation measure	0

[Data type] Real number
[Data range] 0～9999.9999

2653	The e value of automatic tool length compensation	0

[Data type] Real number
[Data range] 0～9999.9999

	7#	6#	5#	4#	3#	2#	1#	0#
2700			EIS			LTM	GS2	GS1

[Data type] Bit
[Data range] 0 or 1

GS2 and GS1 are composed of tool number combination

GS2	GS1	Group	Tool number
0	0	1～16	1～16
0	1	1～32	1～8
1	0	1～64	1～4
1	1	1～128	1～2

LTM: Tool life

    0: Specified by the number of times

    1: Specified by time

EIS: When the life of a tool is measured in time-based units:

    0: The life is counted every four seconds.

    1: The life is counted every second.

[**Standard setting**] 0 0 0 0   0 0 0 0

2710	The omissive number of tool life administration	

[Data type] Integrated
[Data range] 0～ 9999

2711	M code for restarting tool life count	

[Data type] Integrated
[Data range] 0～255

2712	The rest of tool life (frequence of use)	

[Data type] Integrated
[Data range] 0～ 9999

2713	The rest of tool life (time of use)	

[Data type] Integrated
[Data unit] min
[Data range] 0～ 9999

4.13 Pitch Compensation Parameter (2800～2999)

	7#	6#	5#	4#	3#	2#	1#	0#
2800							WDIR	SCRW

[Data type] Bit
[Data range] 0 or 1

      SCRW: Pitch compensation
         0: Not performed
         1: Performed
      WDIR: Pitch compensation selection
         0: Unidirection
         1: Bidirection

[**Standard set]** 0 0 0 0   0 0 0 1

> **Note**
> When this parameter is set, the power must be turned off before operation is continued.

2810	Reference position pitch error compensation number for each axis	

[Data type] Integral axis
[Data range] 0～1023

> **Note**
> 1. When this parameter is set, the power must be turned off before operation is continued.

2811	The farthest pitch error compensation point number for each axis in negative direction	

[Data type] Integral axis
[Data range] 0～1023

> **Note**
> 1. When this parameter is set, the power must be turned off before operation is continued.

2812	The farthest pitch error compensation point number for each axis in positive direction	

[Data type] Integral axis
[Data range] 0～1023

Note
1. When this parameter is set, the power must be turned off before operation is continued.
2. This parameter setting value is more than the No.2810 (reference position pitch error compensation number).

2813	Pitch error compensation override for each axis	

[Data type] Real number axis
[Data unit] ％
[Data range] 1～100

Note
1. When this parameter is set, the power must be turned off before operation is continued.

2814	The interval of pitch error compensation point for each axis	

[Data type] Real number axis
[Data unit] mm
[Data range] 0～9999.9999

Note
1. Pitch error compensation point is distributed in equidistant, the least value of interval = the maximum feedrate/7500 * compensation override
2. When this parameter is set, the power must be turned off before operation is continued.

4.14 Servo Parameter (4000～4999)

	7#	6#	5#	4#	3#	2#	1#	0#
4000		ALMG		IGN5	IGN4	IGNZ	IGNY	IGNX

[Data type] Bit
[Data range] 0 or 1
IGNn: The servo axis is:
  0: Not ignored
  1: Ignored
ALMG: The corresponding switch for system alarms to servo

0: Not alarmed

1: Alarmed

[**Standard setting**] 0 0 0 0　0 0 0 0

	7#	6#	5#	4#	3#	2#	1#	0#
4001	RAST				APZ			

[**Data type**] Bit axis

[**Data range**] 0 or 1

　　APZ: Absolute encoder position and machine position

　　　　0: Not corresponding

　　　　1: Corresponding

　　RST: Whether to use the optical grating

　　　　0: No

　　　　1: Yes

[**Standard setting**] 0 0 0 0　1 0 0 0

4100	Move axis pulse equivalent	

[**Data type**] Real number axis

[**Data unit**] Pulse/mm

[**Data range**]1～99999999

Note

　1. This parameter is valid when the pulse drive servo is used.

4111	The maximum allowable position offset when each axis is stopped	30

[**Data type**] Real number axis

[**Data unit**] um

[**Data range**] 0～32767

4120	Grid or reference point offset value for each axis	

[**Data type**] Real number axis

[**Data range**] 0～99999999

4121	Backlash compensating value for each axis	1

[**Data type**] Real number axis

[**Data unit**] mm

[**Data range**] -9999.9999～9999.9999

4122	Backlash compensating value in rapid traverse rate for each axis	1

[Data type] Real number axis
[Data unit] mm
[Data range] -9999.9999～9999.9999

4123	Step distance of backlash compensation	1

[Data type] Real number axis
[Data unit] mm
[Data range] 0～9999.9999

4200	Password	315

[Data type] Integral number axis
[Data range] 0～9999

4201	Motor type code	65

[Data type] Integral number axis
[Data range] 0～100

4202	Version number	

[Data type] Integral number axis

4203	Initial display state	0

[Data type] Integral number axis

4204	Control mode selection	0

[Data type] Integral number axis
[Data range] 0～7

4205	Speed proportional gain	135

[Data type] Integral number axis
[Data range] 5～1280

4206	Speed integration time constant (ms)	80

[Data type] Integral number axis
[Data unit] ms
[Data range] 0～32767

| **4207** | Torque command filter (%) | 50 |

[Data type] Integral number axis
[Data range] 1~2000

| **4208** | Speed check low-pass filter (%) | 110 |

[Data type] Integral number axis
[Data range] 40~2000

| **4209** | Position proportional gain | 245 |

[Data type] Integral number axis
[Data range] 0~2000

| **4210** | Position feedforward gain (%) | 0 |

[Data type] Integral number axis
[Data range] 0~1280

| **4211** | Position feedforward low-pass cut-off frequency (Hz) | 300 |

[Data type] Integral number axis
[Data unit] Hz
[Data range] 2000

| **4212** | Electron gear rate numerator | 8192 |

[Data type] Integral number axis
[Data range] 0~32767

| **4213** | Electron gear rate denominator | 5000 |

[Data type] Integral number axis
[Data range] 0~32767

| **4214** | Position pulse input mode | 0 |

[Data type] Integral number axis
[Data range] 0~2

4215	Position pulse direction	0

[Data type] Integral number axis
[Data range] 0~1

4216	The completion range of positioning	20

[Data type] Integral number axis
[Data range] 0~32767

4217	Position excess-error check range	30000

[Data type] Integral number axis
[Data range] 0~10000000

4218	Position excess-error check is enabled	0

[Data type] Integral number axis
[Data range] 0~1

4219	Differential proportional coefficient	0

[Data type] Integral number axis
[Data range] 0~127

4220	Invalid drive forbiddance	0

[Data type] Integral number axis
[Data range] 0~1

4221	JOG speed	100

[Data type] Integral number axis
[Data range] -6000~6000

4223	The maximum speed limit	2500

[Data type] Integral number axis
[Data range] 0~6000

4224	Internal speed 1	0

[Data type] Integral number axis
[Data range] -6000~6000

| 4225 | Internal speed 2 | 100 |

[Data type] Integral number axis
[Data range] -6000~6000

| 4226 | Internal speed 3 | 300 |

[Data type] Integral number axis
[Data range] -6000~6000

| 4227 | Internal speed 4 | -100 |

[Data type] Integral number axis
[Data range] -6000~6000

| 4228 | Arrvial speed | 500 |

[Data type] Integral number axis
[Data range] -6000~6000

| 4229 | The 2nd integration time constant of speed | 220 |

[Data type] Integral number axis
[Data range] 0~32767

| 4230 | Linear speed conversion numerator | 10 |

[Data type] Integral number axis
[Data range] 0~32767

| 4231 | Linear speed conversion denominator | 1 |

[Data type] Integral number axis
[Data range] 0~32767

| 4232 | Linear speed decimal point position | 3 |

[Data type] Integral number axis
[Data range] 0~4

| 4233 | The speed in the mode of motor check | 100 |

[Data type] Integral number axis
[Data range] 0~6000

4239	Acceleration time ms	0

[Data type] Integral number axis
[Data unit] ms
[Data range] 0~10000

4241	Servo output pulse number	0

[Data type] Integral number axis
[Data unit]
[Data range] 0~32767

4246	Analog command and pulse output are reverse	0

[Data type] Integral number axis
[Data range] 0~3

4256	The output time is performed in advance when the feedback pulse is more than 10000	20

[Data type] Integral number axis
[Data unit] ms
[Data range] 0~32767

4257	Speed command feedforward gain	200

[Data type] Integral number axis
[Data range] 0~32767

4258	Acceleration command feedforward gain	200

[Data type] Integral number axis
[Data range] 0~32767

4259	Inertia stop decay coefficient	2

[Data type] Integral number axis
[Data range] 1~4

4260	Current proportional gain	1050

[Data type] Integral number axis
[Data range] 0~12800

4261	Current integration time constant	130

[Data type] Integral number axis
[Data unit] ms
[Data range] 0~32767

4262	Current integration separation point	20

[Data type] Integral number axis
[Data range] 0~32767

4264	Current low-pass cut-off frequency	280

[Data type] Integral number axis
[Data unit] Hz
[Data range] 0~32767

4265	Speed integration separation point	200

[Data type] Integral number axis
[Data range] 0~32767

4267	Position excess-error corner 0	20

[Data type] Integral number axis
[Data range] 0~32767

4268	Position excess-error corner 1	350

[Data type] Integral number axis
[Data range] 0~32767

4269	The position proportional gain change rate of position excess-error corner 0	100

[Data type] Integral number axis
[Data range] 0~32767

4270	The position proportional gain change rate of position excess-error corner 1	100

[Data type] Integral number axis
[Data range] 0~32767

4271	Motor rotor inertia	133

[Data type] Integral number axis
[Data range] 0~32767

4272	Motor rated torque	60

[Data type] Integral number axis
[Data range] 0~32767

4273	Motor rated speed	2500

[Data type] Integral number axis
[Data range] 0~32767

4274	The maximum allowable current of current sampling circuit	2500

[Data type] Integral number axis
[Data range] 0~32767

4275	Motor rated current	60

[Data type] Integral number axis
[Data range] 0~32767

4276	The maximum overload capability	200

[Data type] Integral number axis
[Data range] 0~32767

4279	Differential regulation time	200

[Data type] Integral number axis
[Data range] 0~32767

4280	The 2nd integration time constant of current	500

[Data type] Integral number axis
[Data range] 0~32767

4288	The communication error counter of absolute encoder	2

[Data type] Integral number axis
[Data range] 0~32767

4289	The longest time executes when the encoder is set to 0.	3000

[Data type] Integral number axis
[Data range] 0~32767

4290	Zero point offset of encoder	0

[Data type] Integral number axis
[Data range] 0~32767

4294	Wheel display time in alarm	15000

[Data type] Integral number axis
[Data range] 0~32767

4295	Magnetic polar number	4

[Data type] Integral number axis
[Data range] 0~32767

4296	Opened-loop operation voltage	1395

[Data type] Integral number axis
[Data range] 0~32767

4297	Opened-loop operation speed	16

[Data type] Integral number axis
[Data range] 0~32767

4298	SON enforcement is valid	0

[Data type]　Integral number axis
[Data range] 0~1

4299	The voltage value when the encoder is set to 0	4000

[Data type] Integral number axis
[Data range] 0~32767

4300	Feedback speed gain	1000

[Data type] Integral number axis
[Data range] 0~32767

4302	The adjustable pulse width of pulse Z output	30

[Data type] Integral number axis
[Data range] 0~32767

4304	Speed filter cut-off frequency 0	200

[Data type] Integral number axis
[Data range] 0~32767

4305	Speed filter cut-off frequency 1	230

[Data type] Integral number axis
[Data range] 0~32767

4306	Speed filter cut-off frequency 2	250

[Data type] Integral number axis
[Data range] 0~32767

4307	Speed filter cut-off frequency 3	280

[Data type] Integral number axis
[Data range] 0~32767

4309	Speed filter wave separation point 0	3

[Data type] Integral number axis
[Data range] 0~32767

4310	Speed filter wave separation point 1	10

[Data type] Integral number axis
[Data range] 0~32767

4311	Speed filter wave separation point 2	35

[Data type] Integral number axis
[Data range] 0~32767

4312	The check is permited when the encoder command return is incorrect	0

[Data type] Integral number axis
[Data range] 0~1

4313	Inertial stop selection	1

[Data type] Integral number axis
[Data range] 0~1

4314	Over-current alarm delay time	1

[Data type] Integral number axis
[Data range] 0~20

4316	3-second key time	800

[Data type] Integral number axis
[Data range] 400~32767

4317	Open strobe delay time	1500

[Data type] Integral number axis
[Data range] 0~32767

4318	Brake delay time	10000

[Data type] Integral number axis
[Data range] 0~32767

4320	Speed display error compensation	4

[Data type] Integral number axis
[Data range] 0~32767

4.15 Spindle Control Parameter (5000～5999)

	7#	6#	5#	4#	3#	2#	1#	0#
5000	LOOPS				SVAL	ALMS	SWG	SAR

[Data type] Bit

[Data range] 0 or 1

        SAR: The spindle speed arrvial signal is:

            0: Not checked

            1: Checked

        SWG: Spindle alarm switch

            0: Ignored

            1: Accepted and treated

        ALMS: Spindle alarm LEVEL availability

            0: Low LEVEL

            1: High LEVEL

        SVAL: Spindle speed display selection

            0: Command speed

            1: Actual speed

        LOOPS: Spindle position control mode selection

            0: Opened-loop

            1: Closed-loop

5100	The gain regulation data of spindle speed analog output	

[Data type] Integrated

[Data range] 0～1250

5101	The compensation value of spindle speed analog output offset voltage	0

[Data type] Integrated

[Data range] -1024 ～ 1024

5102	Spindle acceleration	2222

[Data type] Real number

[Data unit] rev / s^2

[Data range] 0～99999

5103	Spindle analog output direction	0

[Data type] Integrated

[Data range] 0～1(0: Positive, 1: Negative)

5105	The spindle maximum acceleration in rigid tapping	139

[Data type] Real number
[Data unit] rev / s^2
[Data range] 0～99999

5106	The direction control of closed-loop spindle	0

[Data type] Integrated
[Data range] 0～3

Setting value	Command direction	Feedback direction
0	1	1
1	-1	-1
2	1	-1
3	-1	1

5110	The motor's speed when the spindle orientation or spindle gear shifting are performed	100

[Data type] Integrated
[Data unit] r/min
[Data range] 0～100000

5111	The lowest speed constant of spindle motor	0

[Data type] Integral word
[Data unit] r/min
[Data range] 0～100000

5112	The highest speed constant of spindle motor	6000

[Data type] Integrated
[Data unit] r/min
[Data range] 0～100000

5113	Time check of spindle speed arrival signal	

[Data type] Integrated
[Data unit] ms
[Data range] 0～255

5120	The spindle maximum speed of gear 1	1500

[Data type] Real number
[Data unit] r/min
[Data range] 0～100000

5121	The spindle maximum speed of gear 2	3000

[Data type] Real number
[Data unit] r/min
[Data range] 0～100000

5122	The spindle maximum speed of gear 3	4500

[Data type] Real number
[Data unit] r/min
[Data range] 0～100000

5130	Spindle speed shift point between gear 1- and gear 2	2000

[Data type] Real number
[Data unit] r/min
[Data range] 0～4095

5131	Spindle speed shift point between gear 2- and gear 3	3500

[Data type] Real number
[Data unit] r/min
[Data range] 0～4095

5135	Spindle speed shift point between 1- and gear 2 when the tapping cycle is performed.	1500

[Data type] Real number
[Data unit] r/min
[Data range] 0～100000

5136	Spindle speed shift point between 2- and gear 3 when the tapping cycle is performed.	2000

[Data type] Real number
[Data unit] r/min
[Data range] 0～100000

5139	Spindle default speed	500

[Data type] Integrated
[Data unit] r/min
[Data range] 0～100000

5142	The maximum spindle speed	10000

[Data type] Integrated
[Data unit] r/min
[Data range] 0～100000

5143	Spindle servo loop circuit proportional gain	0.5

[Data type] Real number
[Data range] 0～9999

5144	Spindle servo loop circuit integration gain	0.0005

[Data type] Real number
[Data range] 0～9999

5160	Spindle low gear rate numerator	1

[Data type] Integral number
[Data range] 1～999999

5161	Spindle low gear rate denominator	1

[Data type] Integral number
[Data range] 1～999999

5162	Spindle middle gear rate numerator	1

[Data type] Integral number
[Data range] 1～999999

5163	Spindle middle gear rate denominator	1

[Data type] Integral number
[Data range] 1～999999

5164	Spindle high gear rate numerator	1

[Data type] Integral number
[Data range] 1～999999

5165	Spindle high gear rate denominator	1

[Data type] Integral number
[Data range] 1～999999

5170	The maximum spindle excess-error range	100000

[Data type] Integrated
[Data range] 1～1000000

5171	Spindle pulse equivalence	4096

[Data type] Real number
[Data unit] Pulse number
[Data range] 1～32767

> **Note**
> It is valid when the servo spindle is valid.

4.16 Custom Macro Program Parameter (6000～6999)

	7#	6#	5#	4#	3#	2#	1#	0#
6001						CCV	CLV	TCS

[Data type] Bit
[Data format]

TCS   Subprogram

0: Not called using a T code

1: Called using a T code

CLV   Custom macro's local variable Nos. 1 to 33

0: Cleared to "vacant" by reset

1: Not cleared by reset

CCV   Custom macro's common variables No.s 100 to 199

0: Cleared to "vacant" by reset

1: Not cleared by reset

6050	G code that calls the subprogram number O9010	

6051	G code that calls the subprogram number O9011	

6052	G code that calls the subprogram number O9012	

6053	G code that calls the subprogram number O9013	

6054	G code that calls the subprogram number O9014	

6055	G code that calls the subprogram number O9015	

6056	G code that calls the subprogram number O9016	

6057	G code that calls the subprogram number O9017	

6058	G code that calls the subprogram number O9018	

6059	G code that calls the subprogram number O9019	

[Data type] Integerated
[Data range] 1~9999

These parameters set the G codes that call the custom macros of program numbers 9010 through 9019.

> **Note**
> These parameters set the G codes that call the custom macros of program numbers 9010 through 9019.

6071	M code that calls the subprogram number O9001	

6072	M code that calls the subprogram number O9002	

6073	M code that calls the subprogram number O9003	

6074	M code that calls the subprogram number O9004	

6075	M code that calls the subprogram number O9005	

6076	M code that calls the subprogram number O9006	

6077	M code that calls the subprogram number O9007	

6078	M code that calls the subprogram number O9008	

6079	M code that calls the subprogram number O9009	

[Data type] Integerated
[Data range] 1~9999

These parameters set the M codes that call the custom macros of program numbers 9001 through 9009.

Note
Setting value 0 is invalid. No subprogram can be called by M00.

6080	M code that calls the subprogram number O9020	

6081	M code that calls the subprogram number O9021	

6082	M code that calls the subprogram number O9022	

6083	M code that calls the subprogram number O9023	

6084	M code that calls the subprogram number O9024	

6085	M code that calls the subprogram number O9025	

6086	M code thatcalls the subprogram number O9026	

6087	M code that calls the subprogram number O9027	

6088	M code that calls the subprogram number O9028	

6089	M code that calls the subprogram number O9029	

[Data type] Integerated
[Data unit] 1~9999

Custom macro program M code is called the program numbers from 9020 to 9029.

> **Note**
>   Setting value 0 is invalid. No custom macro program can be called by M00.

4.17 System Diagnosis Configuration Parameter (9000～9999)

9101	System control axis number selection	3

[Data type] Integerated
[Data range] 2～5

9120	Screen-protection time waiting	50

[Data type] Integerated
[Data unit] min.
[Data range] 0～9999

9121	System interpolation period time ms	2

[Data type] Real number
[Data unit] ms
[Data range] 0.01～9999.9999

> **Note**
>   When this parameter is set, the power must be turned off before operation is continued.