GIKEN

AC Nut runner series

Setup software for GSK/GSKW

Instruction manual

GIKEN INDUSTRIAL CO., LTD.

Before beginning operation

Caution

■Note

①Please read this instruction manual carefully in order to ensure that you use this product correctly.
②A part or no part of this instruction manual may be used or reproduced without the permission of GIKEN Industrial CO., LTD.
③Regarding the handling process and operation that aren't listed in this instruction manual, please think that they cannot be operated, and don't attempt to operate them. Any defect that would occur when the handling process or the operation that is not listed in this instruction manual is executed should be excluded in the scope of the warranty.
④Matters listed in this instruction manual are subject to change for the improvement without notice.
⑤For the product with special specifications, please consult us because it may not be pertinent to the use of this instruction manual.
⑥The personal computer for set up operation is an option. Please contact us if it is required.

Caution

■Measures in case of an emergency

If this product is in a dangerous condition, immediately turn OFF all power switches of the main unit or the connected equipment, or pull out all power cords from the plug outlets.
(「Dangerous condition」 means the condition when the fire break out or the danger to personal injury can be expected due to the excessive heat generation, smoking or ignition.)

Outline

This product is the set up soft ware for the GSK/GSKW controller.
GSK • GSK controller can be done manually input of setting data by the controller front, but we will use this software to the input of the configuration data in order to allow easier to understand in a simple.
We can improve simplification of the initial setting input and the maintenance, by the batch transmission function that we use setup software.
You can see the display of torque waveform. Also others will be able to perform reading of history tightening, etc.

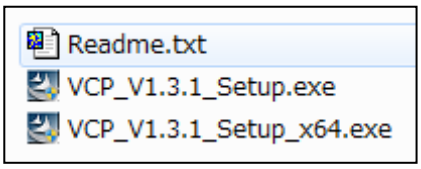
Operating environment

OS：Windows XP(32bit, 64bit)
Windows Vista (32bit, 64bit)
Windows 7 (32bit, 64bit)
Windows 8 (32bit, 64bit)
RAM: Windows XP, Vista: 2GB or more
Windows 7, 8: 4GB or more
Installation directory: C:¥GIKEN¥GSK Setting
Starting method: GSK.exe

Password to write to the controller is [2014].

Before set up software start

・In the USB driver folder ↓



Please open USB Driver folder on the set up software disc.

Please install the corresponding USB driver at the time of the following.

32bit OS⇒ [VCP_V1.3.1_Setup.exe]

64bit OS⇒ [VCP_V1.3.1_Setup_x64.exe]

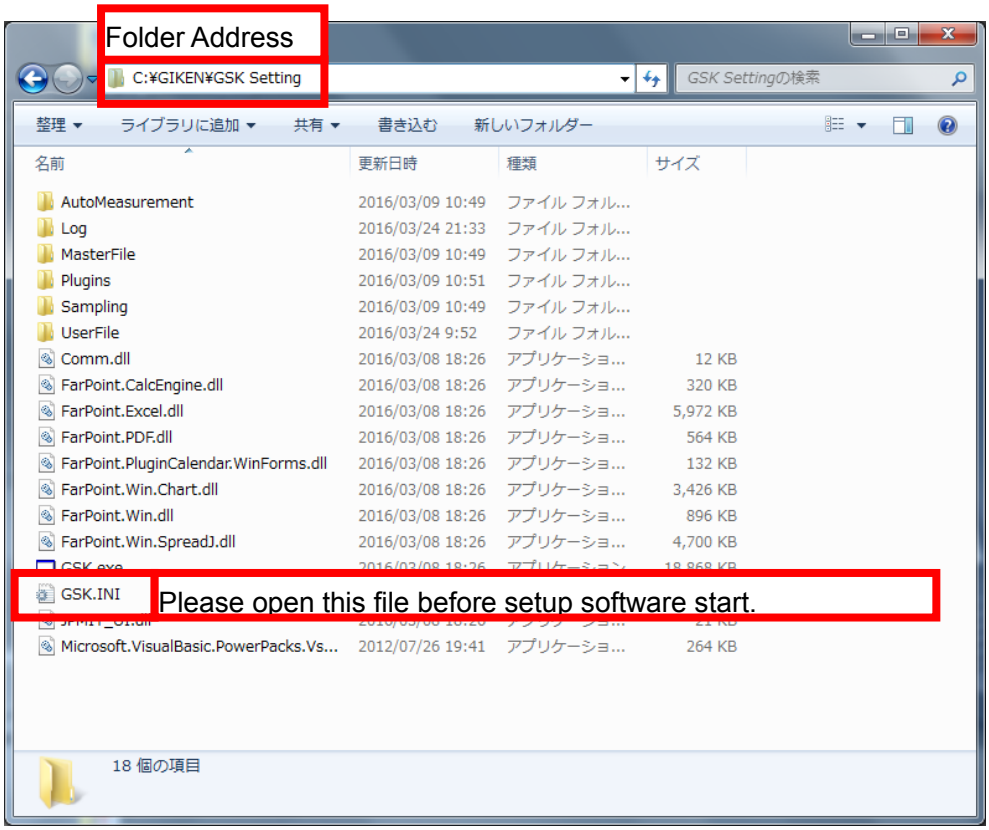
You need to install the USB driver of the above is to use this set up software.

Port setting

Folder of [GSK setting] will be created when the installation of the setup software is completed.

([GSK setting] is default folder name.　You can change this name when this software installed.)

Please open this folder. (This folder address is [C:¥GIKEN¥GSK setting].)



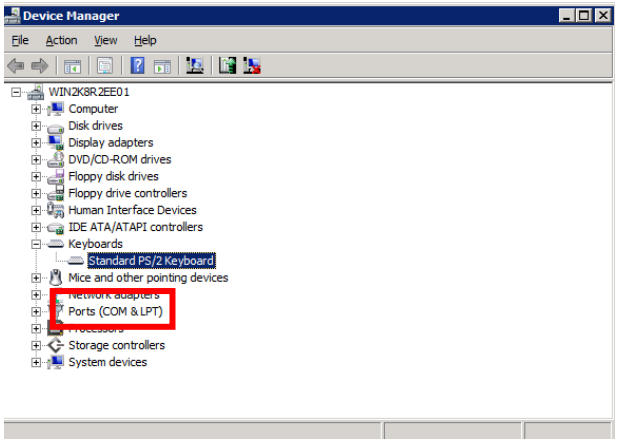


Fig (1) Device Manager

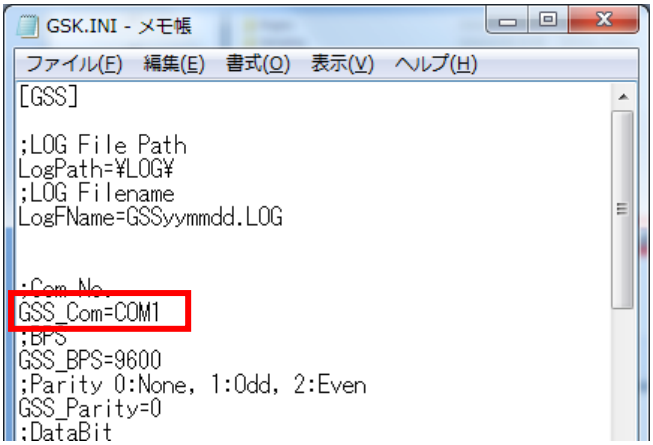


Fig (2) INI faille

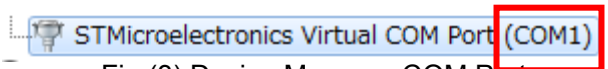


Fig (3) Device Manager COM Port

If you connected USB to GSK interface the setup PC, the port such as Fig (3) will appear on Device Manager.

It has a COM Port number like Fig (3).

Please write the COM Port number to GSS_Com in GSS.INI file like Fig (2).

Please save the INI file if you finish writing.

The preparation to start setup software is the end.

This work enables communication with GSK in the setup software.

INDEX

1. Main menu

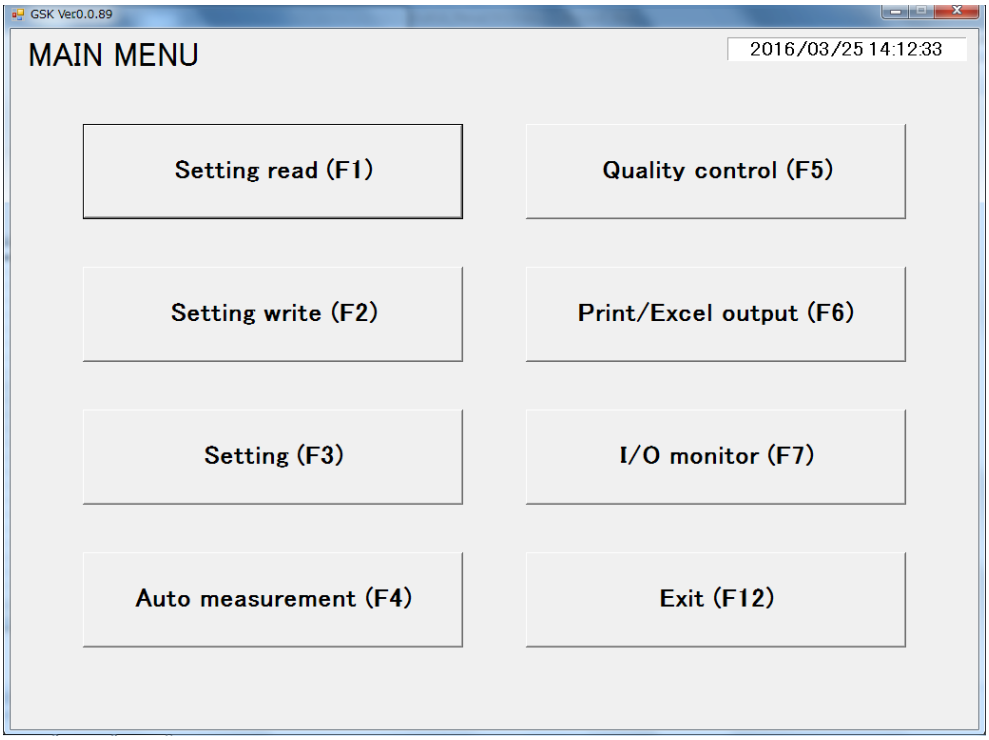


Fig (1-1) Main menu

- Setting read (F1) The setting data is read from file , controller , and SD card.
- Setting write (F2) The setting data is written to file , controller or SD card.
- Setting(F3) The setting menu is displayed.
- Auto measurement (F4) The auto measurement menu is displayed.
- Quality control（F5） The quality control screen is displayed.
- Print/Excel output(F6) The print and excel output menu is displayed.
- I/O Monitor(F7) The I/O monitor menu is displayed.
- Exit(F12) Exit the program.

1-1. Screen structure

Screen configuration is as follows.

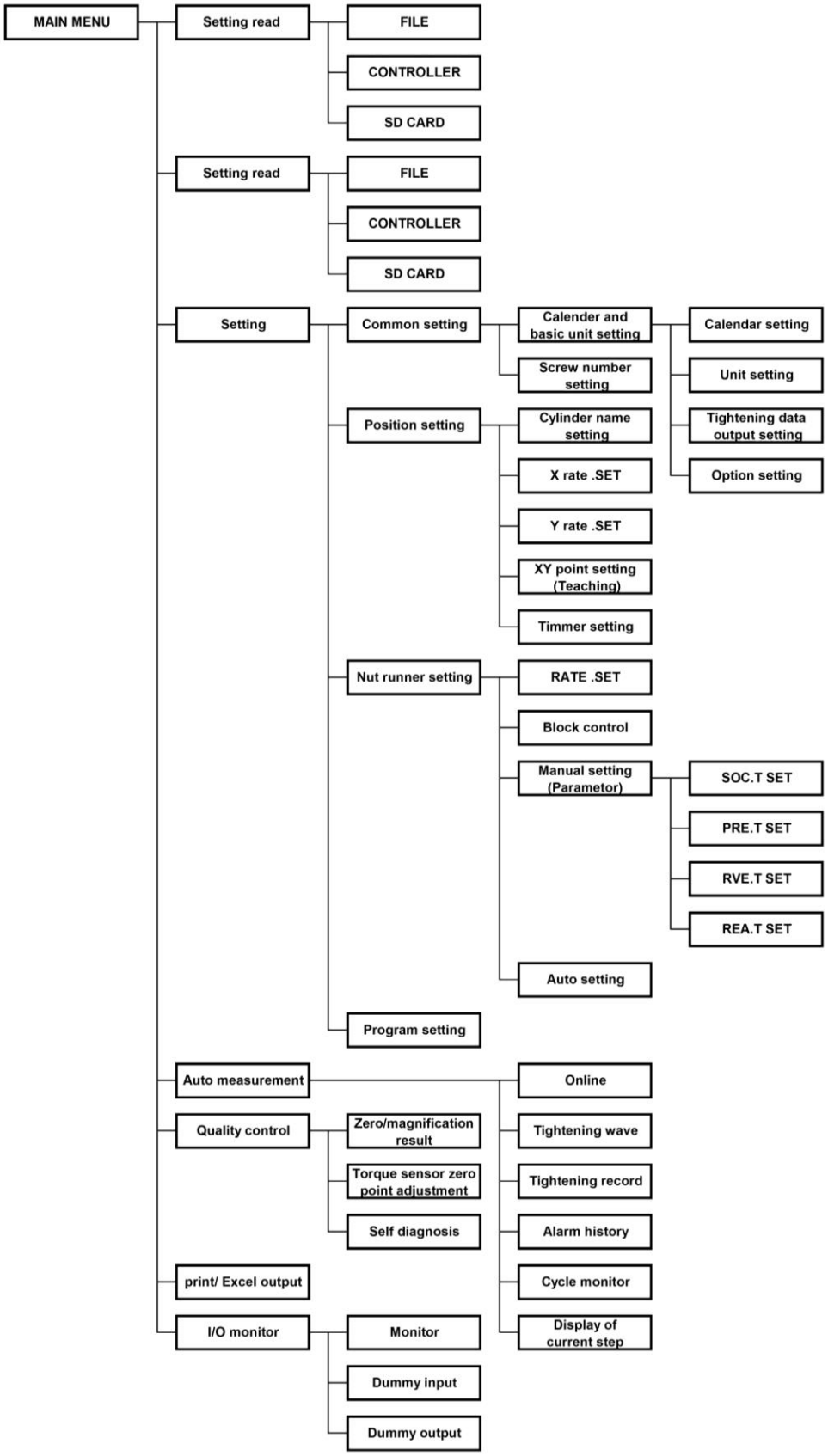


Fig (1-1): Hierarchy diagram

1-2.Main menu initial screen

Inquiry "Do you want to communicate?" is coming when the program is started.

In this time if you select “Yes”, version and communication check will be started.

If you select “No”, you enter the main menu without communication.

Fig (1-2): "Do you want to communicate?"

1-3. Communication check, version check function

If you select "Yes" in the above "1-2 Main menu initial screen", automatically GSK controller does communication check, and the version check.

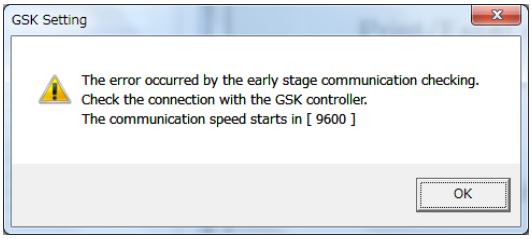


Fig (1-3): Initial communication check error

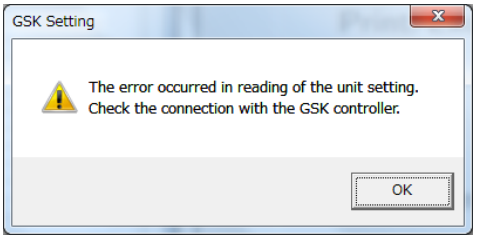
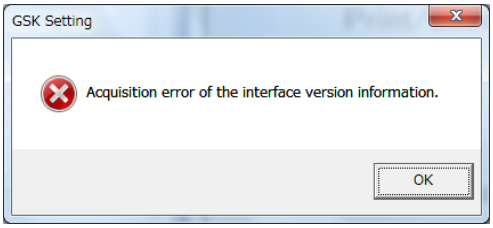


Fig (1-4): Unit setting acquisition error(※)



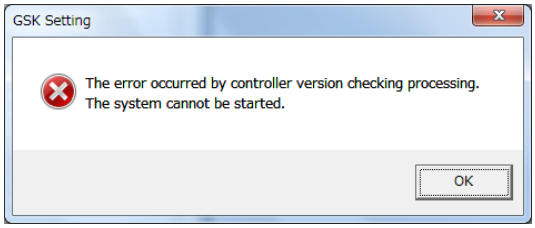


Fig (1-5): Controller version check error

(※) Unit setting of a GSK controller is acquired automatically at the time of program initiation.

2. Setting read

You will select “Setting read” from “Main menu”. You read the GSK configuration file, from the controller or SD card, some folder.

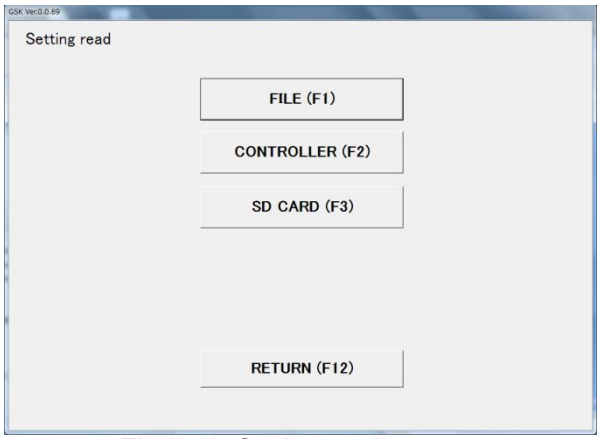


Fig (2-1): Setting read screen

·File[F1]
It reads the GSK configuration file from some folder.
·Controller[F2]
It reads the GSK configuration file from the controller.
If you read the configuration file from the GSK controller, the controller and computer must be connected by a USB cable.
・SD card[F3]
You can save the settings of GSK controller to the SD card as a file.
You can read the GSK settings from the SD card by the configuration PC.

2-1. File

Fig (2-2): Selection of the read files

In the selection of the read files, please select a file that file extension is GSK.

You select the GSK configuration file to read in the file selection dialog.

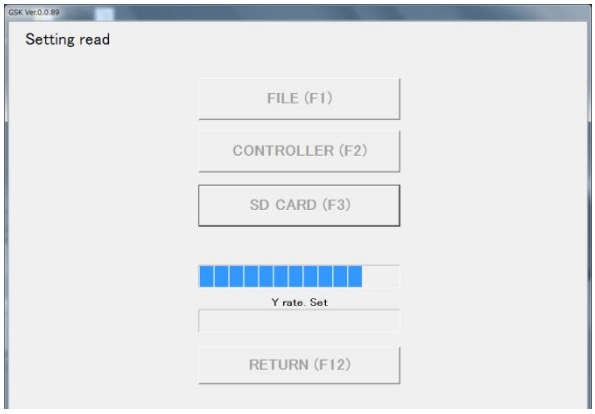


Fig (2-3): Reading files from the folder

When you select a file, reading will start.
Progress of the reading GSK configuration file is displayed.
The GSK configuration file has the following settings.

Unit setting	Screw number setting
Nut runner setting	Position setting
Program setting	

※GSK configuration file will not be saved the following setting

Tightening output setting	Calendar setting
Option setting	Auto setting

When the reading GSK configuration file is complete, the following message is displayed.
After the reading GSK configuration file, it goes to the “Main menu”.

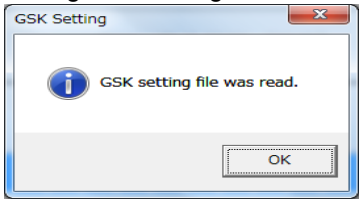


Fig (2-4): Finish reading configuration file

2-2. Controller

It reads from the set value stored in the internal GSK controller.

If you read the configuration file from the GSK controller, the controller and computer must be connected by a USB cable.

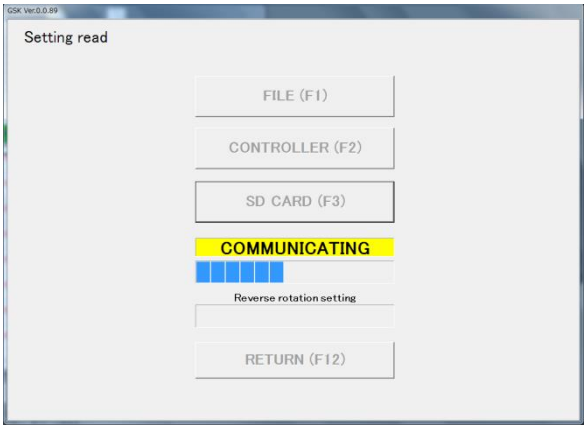


Fig (2-5): Reading files from the controller

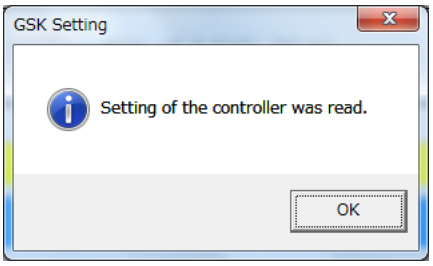


Fig (2-6): Finish reading configuration file

When the reading from the controller is finished, you will see a message in the Fig (2-6).

After the reading GSK configuration file from the controller, it goes to the “Main menu”.

2-3. SD card

It reads a configuration file on the SD card by the GSK controller. (Extension: SD)

※Setting values stored in the SD card is the extension SD.

※If you read the settings from the SD card, you will need an SD card is inserted into a personal computer.

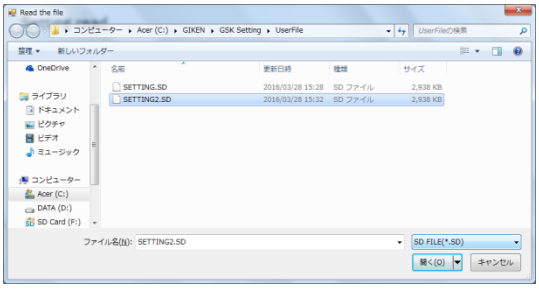


Fig (2-7): Selection of the read files

In the selection of the read files, please select a file that file extension is SD

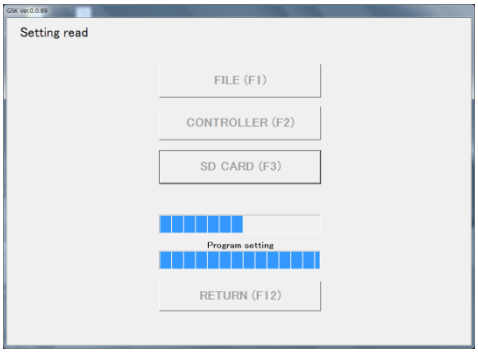


Fig (2-8): Reading files from the SD card

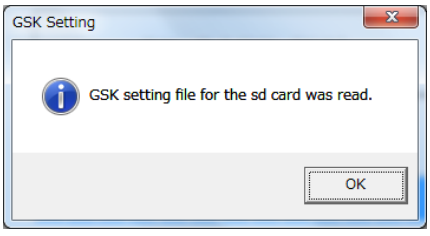


Fig (2-9): Finish reading configuration file

When the reading from the SD card is finished, you will see a message in the Fig (2-8).

After the reading GSK configuration file from the SD card, it goes to the “Main menu”.

3. Setting write

You will select “Setting write” from “Main menu”. You write the GSK configuration file to the controller or SD card, some folder.

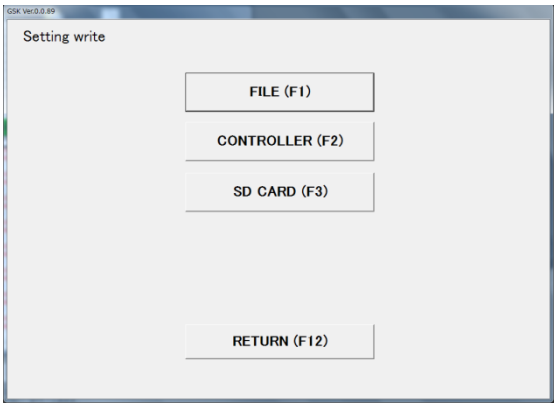


Fig (3-1): Setting write screen

·File[F1]
It writes the GSK configuration file to some folder.
·Controller[F2]
It reads the GSK configuration file to the controller.
If you write the configuration file to the GSK controller, the controller and computer must be connected by a USB cable.
·SD card[F3]
You can save the settings of GSK controller to the SD card as a file.
You can write the GSK settings to the SD card by the configuration PC.

3-1. File

In the file writing process, It writes the GSK setting to a hard disk or other accessible media,.

The file t to retain the settings of GSK is saved in the file extension of [.GSK].

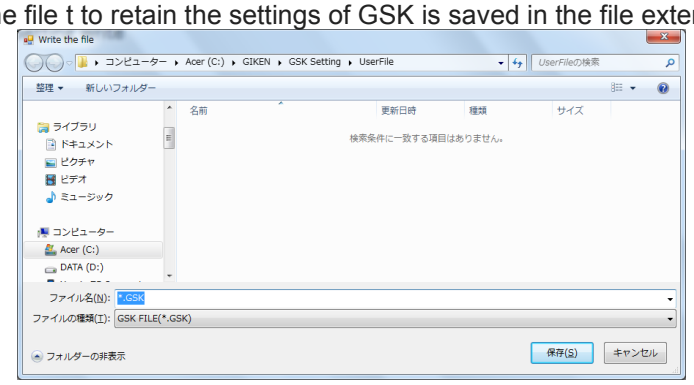


Fig (3-2): Writing files naming

It names and saves the settings by the file selection dialog.

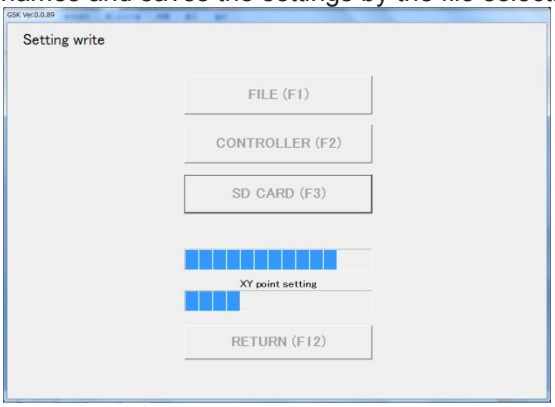


Fig (3-3): Progress of writing

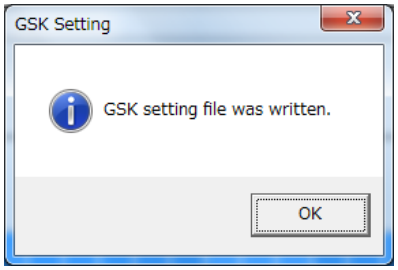


Fig (3-4): complete the writing

When you press the Save button in the dialog, it will start the file writing.

When the writing of GSK configuration file is complete, the message of Fig (3-4) will be displayed.

(※) Please see the “2-1. File” about the GSK configuration file.

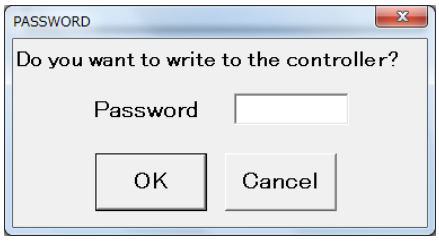
3-2. Controller

You write the configuration file to GSK controller.

If you write the configuration file to the GSK controller, the controller and computer must be connected by a USB cable.

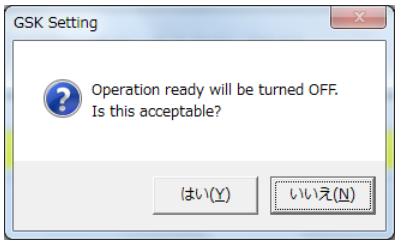
The password to write to the controller is required. (Initial Password: 2014)

If the password is unknown, the configuration file cannot be written to the controller.



Fig(3-5): Password confirmation

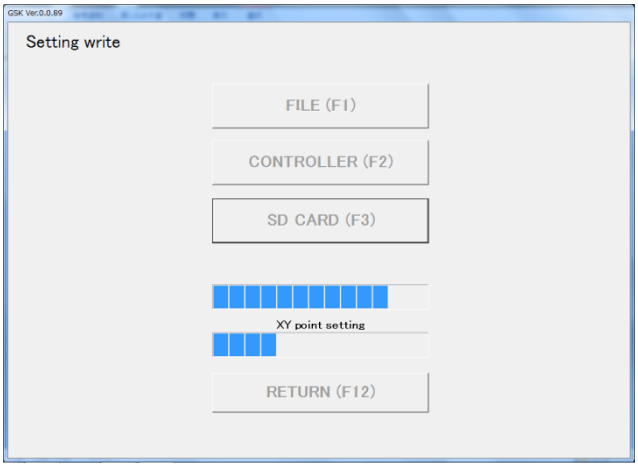
If you push “OK”, it moves to Fig (3-6).



Fig(3-6): Operation preparation OFF confirmation

Please OFF the operation preparation.

It cannot be written the configuration file when you don’t turn OFF the operation ready.



Fig(3-7):Progress of writing to the controller

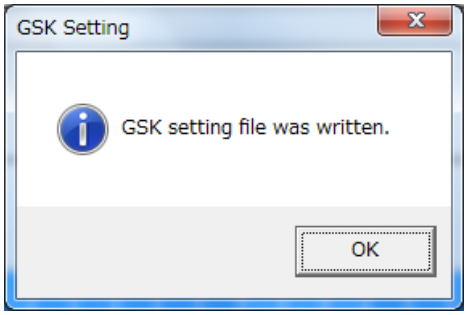


Fig (3-8): complete the writing

When the writing of GSK configuration file to controller is complete, the message of Fig (3-8) will be displayed.

3-3. SD card

In the file writing process, it writes a file that can be read by GSK controller to the SD card.

File extension of the configuration file to be saved to the SD card is ".SD".

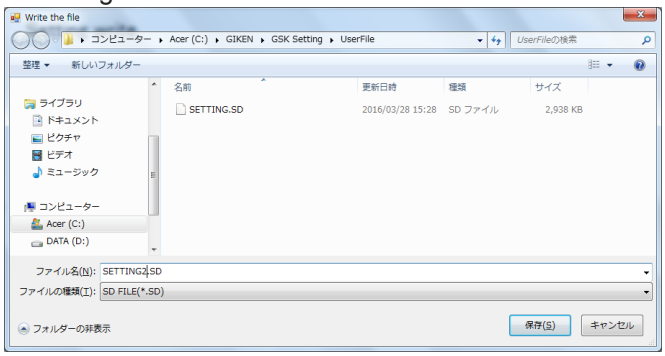
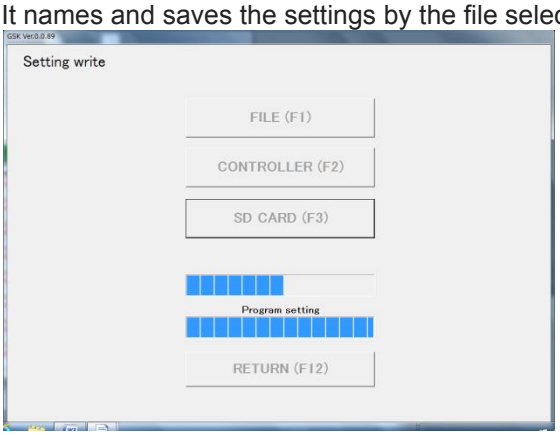
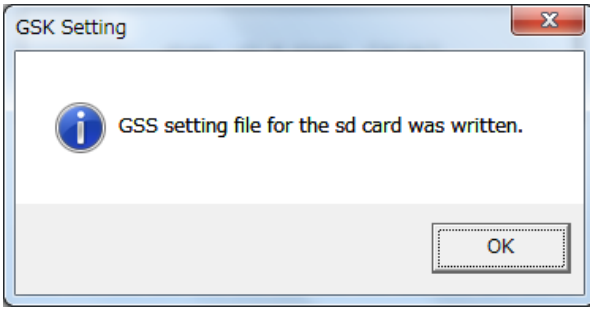


Fig (3-8): Writing files naming

It names and saves the settings by the file selection dialog.



Fig(3-9):Progress of writing to the SD card



Fig(3-10): complete the writing

When you press the Save button in the dialog, it will start the file writing.

The progress of writing to the SD card will be displayed.

When the writing of GSK configuration file is complete, the message of Fig (3-10) will be displayed.

4. Setting

You will select “Setting” from “Main menu”.

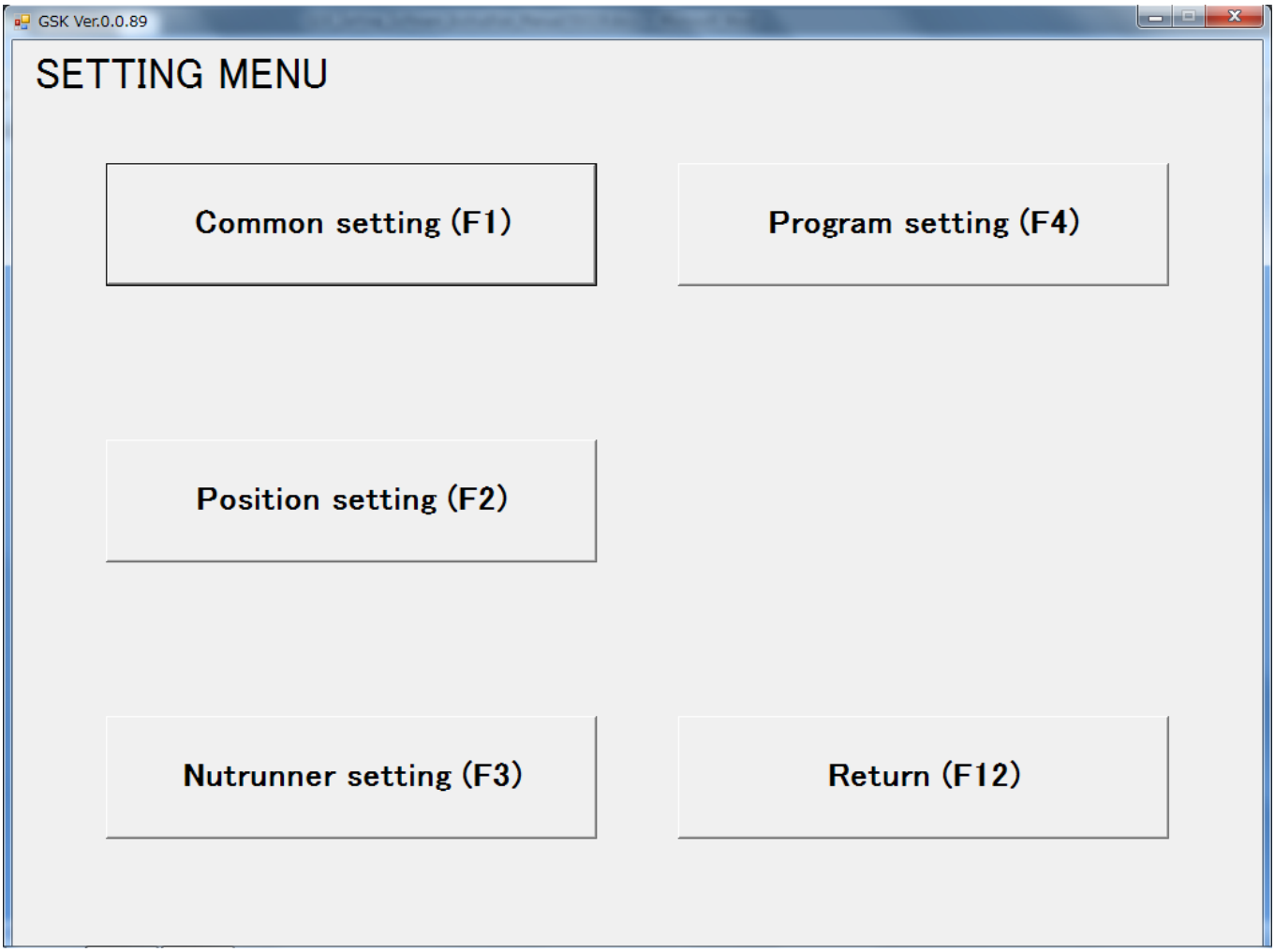


Fig (4-1): Setting Menu

- Common setting (F1) — Common setting menu is displayed.
- Position setting (F2) — Position setting menu is displayed.
- Nut runner setting (F3) — Nut runner setting menu is displayed.
- Program setting (F4) — Program setting menu is displayed.
- Return (F12) — It will return to Main Menu.

4-1.Common setting

You will select “Common setting” from “Setting menu”.

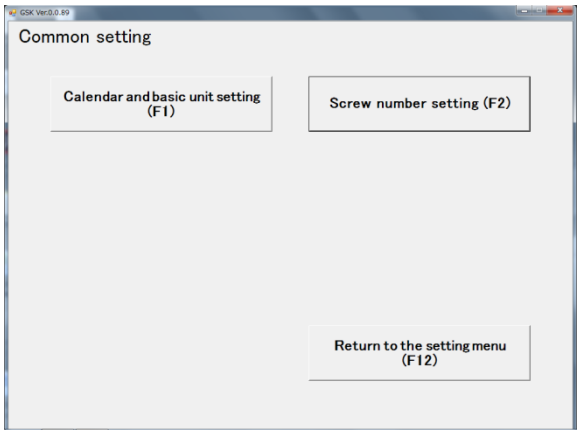


Fig (4-2): Common setting menu

- Calendar and basic unit setting (F1) It displays the “Calendar and basic unit setting menu”.
- Screw number setting (F2) It displays the “Screw number setting”.
- Return to the setting menu (F12) To return to the setting menu.

4-1-1. Calendar and basic unit setting

You will select “Calendar and basic unit setting” from “Common setting menu”.

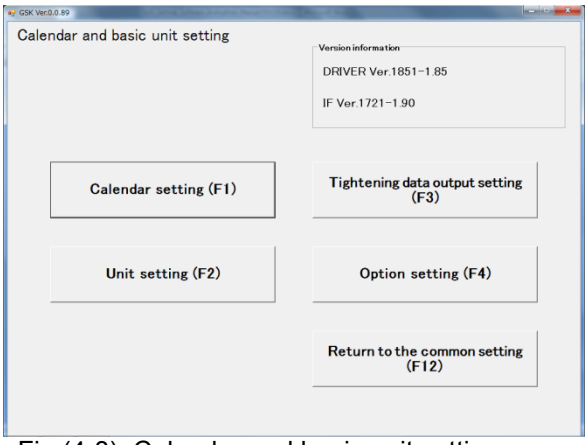


Fig (4-3): Calendar and basic unit setting menu

- Calendar setting (F1) It displays the “Calendar setting”
- Unit setting (F2) It displays the “Unit setting”.
- Tightening data output setting (F3) It displays the “Tightening data output setting”
- Option setting(F4) It displays the “Option setting”.
- Version information It displays the version of the controller and interface.
- Return to the common setting menu (F12) To return to the “Common setting menu”.

4-1-1-1. Calendar setting

You will select “Calendar setting” from “Calendar and basic unit setting menu”.

This displays the calendar information on the controller, also it sets the calendar information of the PC to the controller.

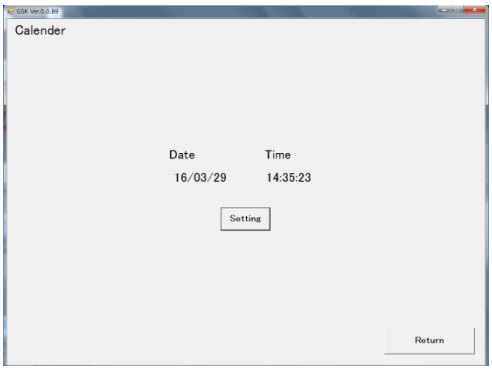


Fig (4-4): Calendar setting

- Data — It displays the current date of the controller.
- Time — It displays the current time of the controller.
- Setting — It sets the calendar information of the PC to the controller.
- Return — To return to the “Calendar and basic unit setting”.

4-1-1-2. Unit setting

You will select “Unit setting” from “Calendar and basic unit setting menu”.

It displays the affiliated unit of each axis, and set.

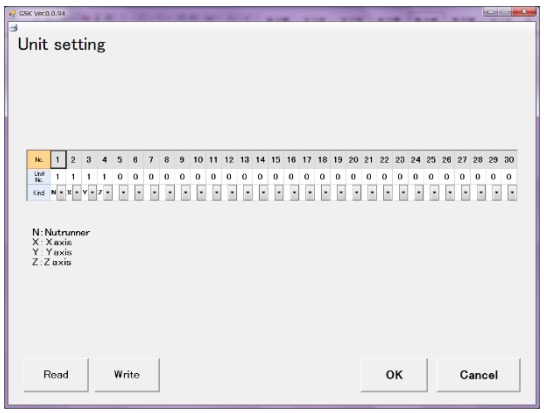


Fig (4-5): Unit setting

- Unit No. — It has to display the affiliation unit of the axis.
- Kind — It displays the type of axis. N: Nut runner, X: x-axis, Y: y-axis, Z: z-axis
- Read — It displays the loading screen of the unit configuration.
- Write — It displays the writing screen of the unit configuration.
- OK — It is to accept the changes and return to the calendar basic unit setting menu.
- Cancel — It erases the changes and return to the calendar basic unit setting menu.

4-1-1-3. Tightening data output setting

You will select “Tightening data output setting” from “Calendar and basic unit setting menu”.

Here you set the tightening data to output from the controller.

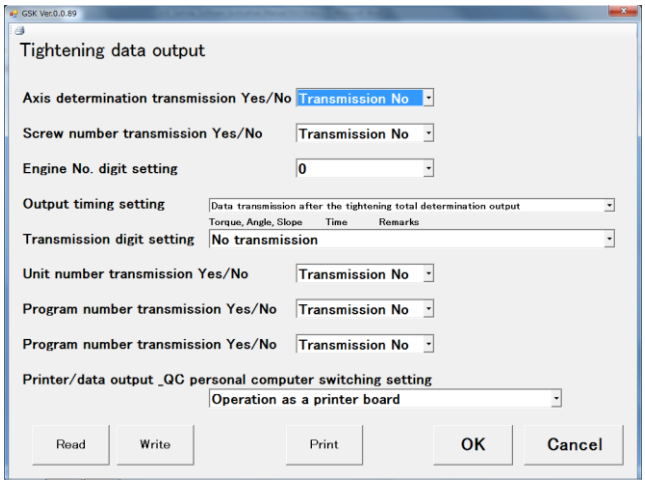


Fig (4-6): Tightening data output setting

※Please refer to the controller's instruction manual for setting the contents of the tightening data output settings.

- ・Read　　It displays the loading screen of tightening data output settings.
- ・Write　　It displays the writing screen of tightening data output settings.
- ・Print　　It runs the printing of tightening data output settings.
- ・OK　　It is to accept the changes and return to the calendar basic unit setting menu.
- ・Cancel　　It erases the changes and return to the calendar basic unit setting menu.

4-1-1-4. Option setting

You will select “Option setting” from “Calendar and basic unit setting menu”.

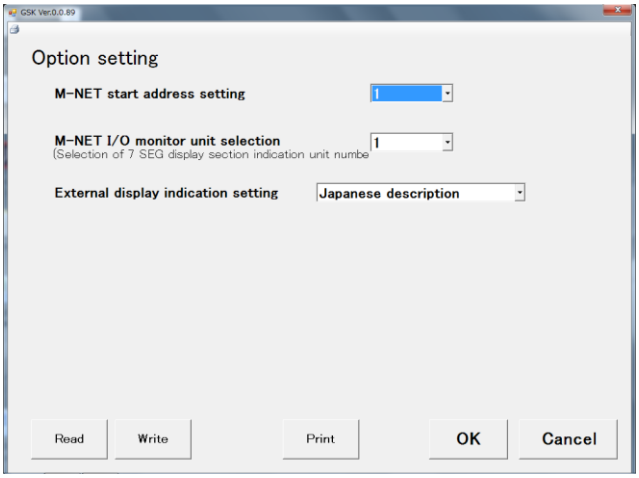


Fig (4-7): Option setting

※Please refer to the controller's instruction manual for setting the contents of the option settings.

- Read　　It displays the loading screen of option setting.
- Write　　It displays the writing screen of option setting.
- Print　　It runs the printing of option setting.
- OK　　It is to accept the changes and return to the calendar basic unit setting menu.
- Cancel　　It erases the changes and return to the calendar basic unit setting menu.

4-1-2. Screw number setting

You will select “Screw number setting” from “Setting menu”.

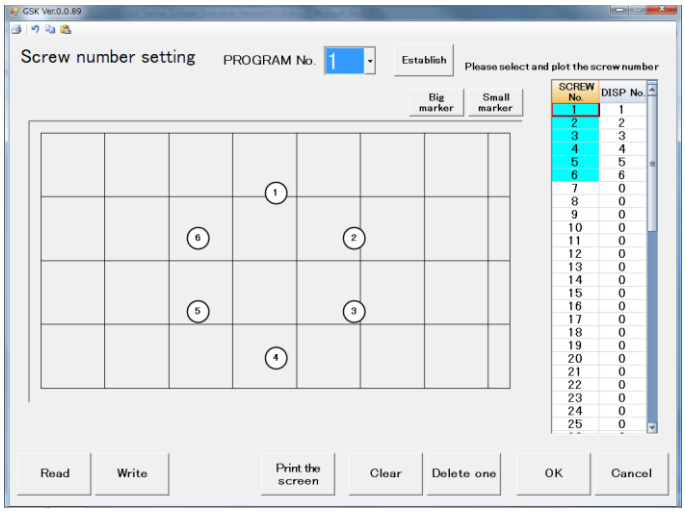


Fig (4-8): Screw number setting screen

- PROGRAM No. It set the program number you want to set.
- Screw No. Select You select the screw number you want to plot.
- Axis array setting form It will set the axis arrangement with the left click of the mouse to this place.
- SCREW No. The number of screw to be set
- DISP No . The number to display

- Big marker It displays the marker of the screw number to be plotted on the axis array form in big size.
- Small marker It displays the marker of the screw number to be plotted on the axis array form in small size.
- Read It displays the loading screen of option setting.
- Write It displays the writing screen of option setting.
- Print the screen It runs the printing of option setting.
- Clear All the array data on the configuration form to delete.
- Delete one It will remove the marker of the screw number that has been selected on the configuration form.
- OK It is to accept the changes and return to the setting menu.
- Cancel It erases the changes and return to the setting menu.

4-2. Position setting

You will select “Position setting” from “Setting menu”.

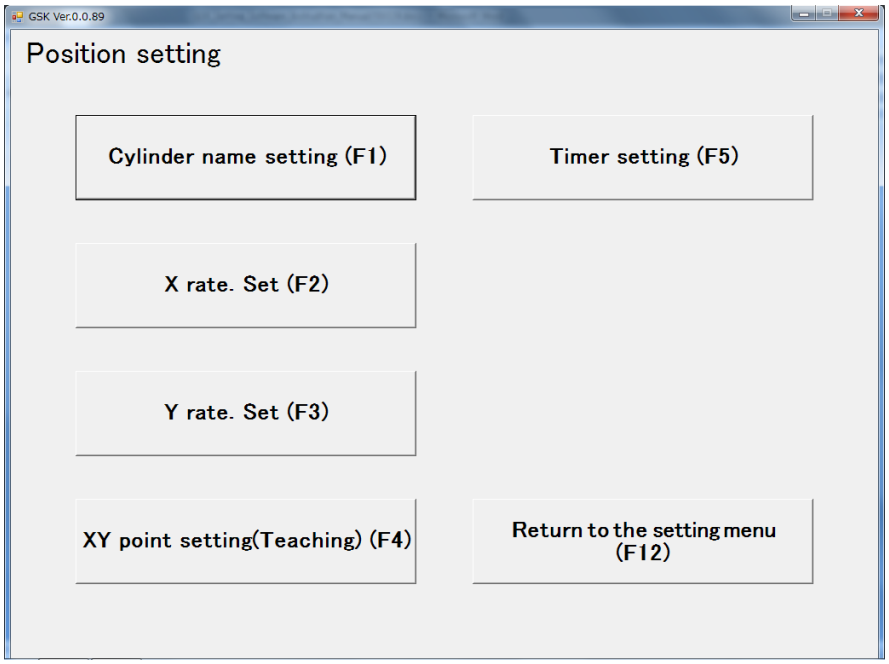


Fig (4-9): Position setting

- Cylinder name setting (F1) It displays the cylinder name setting screen.
- X rate. Set (F2) It displays the “X rate. Set” screen.
- Y rate. Set (F3) It displays the “Y rate. Set” screen.
- XY point setting (Teaching) (F4) It displays the XY point setting screen.
- Timer setting (F5) It displays the monitoring timer setting screen.
- Return to the setting menu (F12) To return to the setting menu.

4-2-1. Cylinder name setting

You will select “Cylinder name setting” from “Position setting menu”.

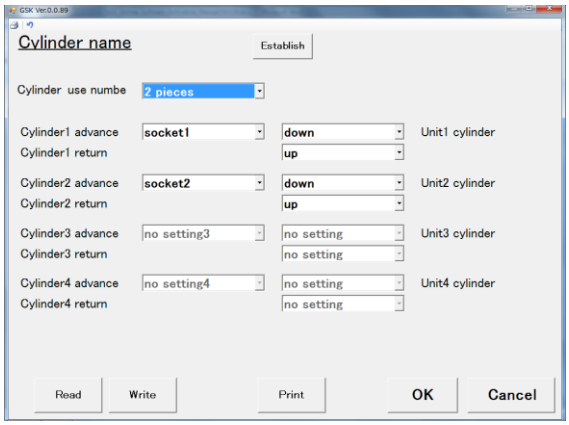


Fig (4-10): Cylinder name setting

If you set the cylinder name, the character of name on the IO monitor is changed to it.

(example) Cylinder1 advance ⇒ N/R 1 descent

- Cylinder use number — You select the number of cylinders to be used.
- Cylinder name setting — Cylinder1 advance, Cylinder1 return, Cylinder2 advance, Cylinder2 return Cylinder3 advance, Cylinder3 return, Cylinder4 advance, Cylinder4 return It sets the above name.

- Read — It displays the loading screen of Cylinder name setting.
- Write — It displays the writing screen of Cylinder name setting.
- Print — It runs the printing of Cylinder name setting.
- OK — It is to accept the changes and return to the position setting menu.
- Cancel — It erases the changes and return to the position setting menu.

4-2-2. X rate. Set

You will select “X rate. Set” from “Position setting menu”.

Here, it will set the rating of the X-axis positioning motor.

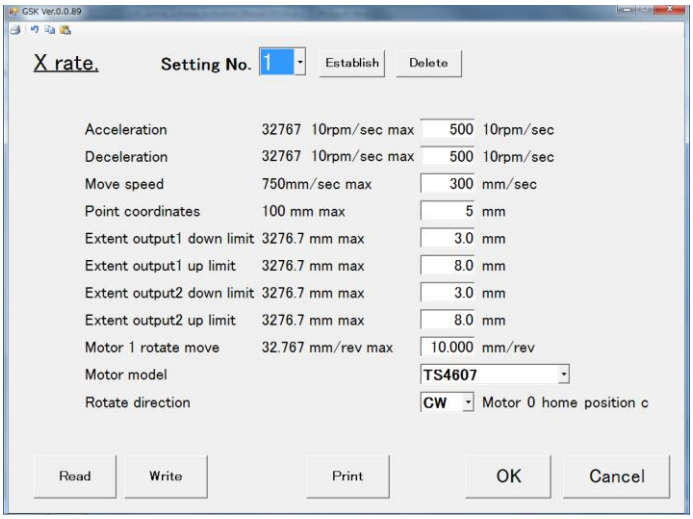


Fig (4-11): X rate setting

· Setting No. It selects the setting number to be set.

· Acceleration(Input range: 0 to 32767)

It sets the acceleration constant to reach the moving speed from the motor operation start.

· Deceleration (Input range: 0 to 32767)

It sets the deceleration constant that the motor reaches the operation stop from moving speed.

· Move speed(Input range: [“Motor 1 rotate move” * 75])

It sets the movement speed. “Motor 1 rotate move” is set under.

· Point coordinates(Input range: 0 to 100)

It sets the range to be detected as the point when you point output in the external communication output signal.

· Extent output 1 down limit(Input range: 0 to 3276.7), Extent output 1 up limit (Input range: 0 to 3276.7)

They specify a range of external communication output signal "X range output ".

· Extent output 2down limit (Input range: 0 to 3276.7), Extent output 2 up limit (Input range: 0 to 3276.7)

They specify a range of external communication output signal "X range output ".

· Motor 1 rotate move(Input range: 0 to 32.767)

It sets the distance that the positioning motor to move in one revolution.

The distance will change by those you want to use. So you set according to it

· Rotate direction It sets the direction in which to work mechanically the positive side from the original position.

· Establish It establish the change contents.

· Delete It will return the value of the current set number to default.

· Read It displays the loading screen of X rate. Set.

· Write It displays the writing screen of X rate. Set

· Print It runs the printing of X rate. Set

· OK It is to accept the changes and return to the position setting menu.

· Cancel It erases the changes and return to the position setting menu.

4-2-3. **Y rate. Set**

You will select “Y rate. Set” from “Position setting menu”.

Here, it will set the rating of the Y-axis positioning motor.

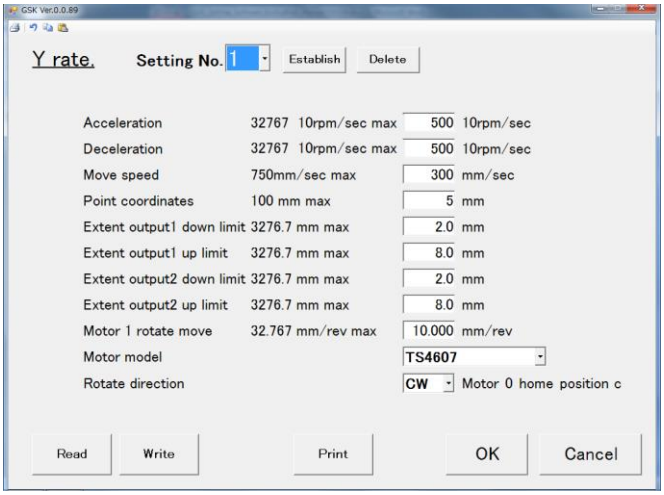


Fig (4-12): Y rate setting

· Setting No. It selects the setting number to be set.

· Acceleration(Input range: 0 to 32767)

It sets the acceleration constant to reach the moving speed from the motor operation start.

· Deceleration (Input range: 0 to 32767)

It sets the deceleration constant that the motor reaches the operation stop from moving speed.

· Move speed(Input range: [“Motor 1 rotate move” * 75])

It sets the movement speed. “Motor 1 rotate move” is set under.

· Point coordinates(Input range: 0 to 100)

It sets the range to be detected as the point when you point output in the external communication output signal.

· Extent output 1 down limit(Input range: 0 to 3276.7), Extent output 1 up limit (Input range: 0 to 3276.7)

They specify a range of external communication output signal "Y range output ".

· Extent output 2down limit (Input range: 0 to 3276.7), Extent output 2 up limit (Input range: 0 to 3276.7)

They specify a range of external communication output signal "Y range output ".

· Motor 1 rotate move(Input range: 0 to 32.767)

It sets the distance that the positioning motor to move in one revolution.

The distance will change by those you want to use. So you set according to it

· Rotate direction It sets the direction in which to work mechanically the positive side from the original position.

· Establish It establish the change contents.

· Delete It will return the value of the current set number to default.

· Read It displays the loading screen of Y rate. Set.

· Write It displays the writing screen of Y rate. Set

· Print It runs the printing of Y rate. Set

· OK It is to accept the changes and return to the position setting menu.

· Cancel It erases the changes and return to the position setting menu.

4-2-4. XY point setting (Teaching)

Here, it is the coordinate setting of the tightening point.

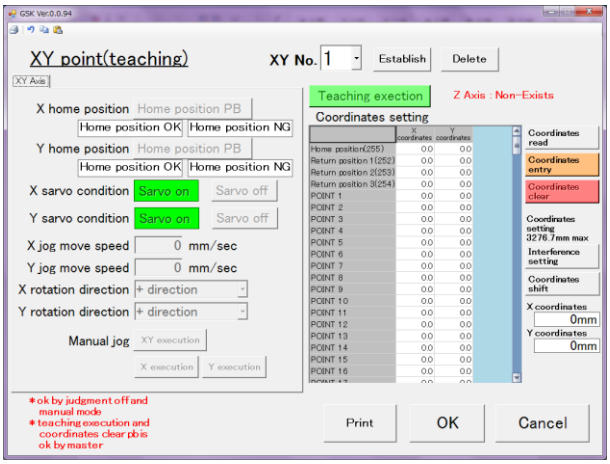


Fig (4-13): XY point setting (Teaching)

The following screen appears when you select “XY point setting (Teaching)” from “Position setting menu”.

Please select the "Yes", if you set point.

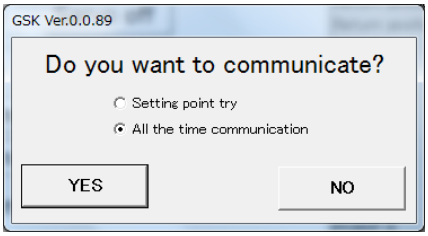


Fig (4-14): Communication confirmation

・XY No. It will select the XY number to be set.

※XY number is the same as the unit number.

XY Tab

・X home position, Y home position:(Home position PB) It will make the home return of the unit of XY number.

・X servo condition, Y servo condition It displays the servo state of the X-axis and Y-axis.

・X JOG move speed, Y JOG move speed It sets the speed at which move in the manual JOG operation.

・X rotation direction, Y rotation direction It sets the direction of rotation at which move in the manual JOG operation.

・Manual jog

It will move only while pressing the buttons of a "XY- execution " and "X- execution ", "Y- execution".

If you specify a point, it will move at a speed that you specify up to the point.

If the point is multiple choices, most young point number is enabled.

If you do not specify a point, it will move to a specified direction by the specified speed.

· Teaching execution

It sets the current coordinates to the coordinate's cell of the specified point in the table.

· coordinates read　　It reads the coordinate values that are currently registered from the controller

· coordinates entry

It registers the coordinate values that are displayed on the screen to the controller.

· coordinates clear　　It is the cell of the specified point to 0.

· Interference setting　　It goes to the interference setting screen.

· coordinates shift　　The coordinates are displayed on the screen can be shifted in the following screen.

※If the coordinate value of 0 will not be shifted.

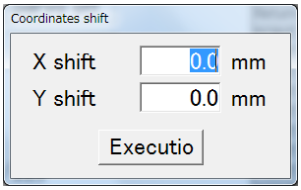


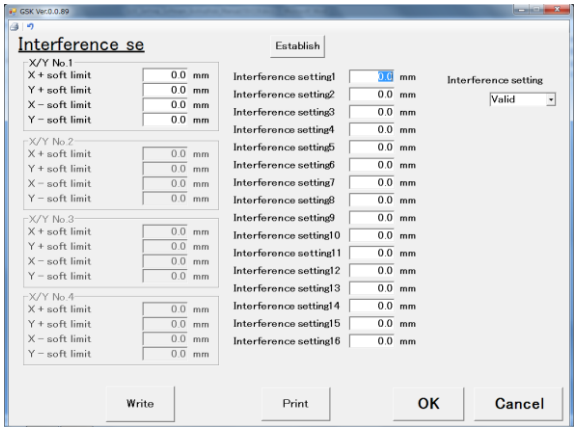
Fig (4-15): coordinates shift

· X coordinates, Y coordinates, Z coordinates　　It displays the current coordinate value of the unit number.

4-2-4-1 Interference setting

You will select "Interference setting" from "XY point setting (Teaching)".

Password is required for this mode.



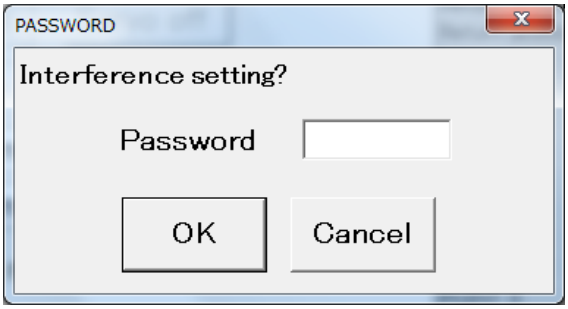


Fig (4-16): Interference setting

· X-axis coordinate + soft limit, X-axis coordinate - soft limit,

Y-axis coordinate + soft limit, Y-axis coordinate - soft limit

（Input range: -3276.7～3276.7)

X-axis in the operation other than JOG operation of teaching, all of the operations relating to the Y-axis will not work in a position that exceeds the software limit.

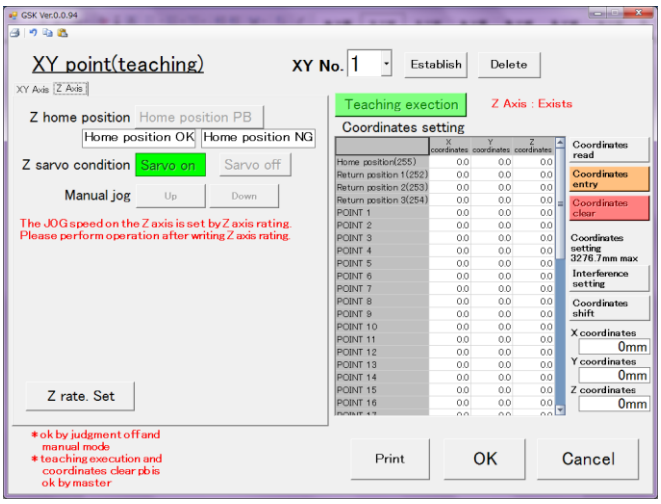
Towards the point where the coordinate value exceeds the above range, when trying to move it performs as a target position a soft limit position.　　Abnormality is not output after the operation.

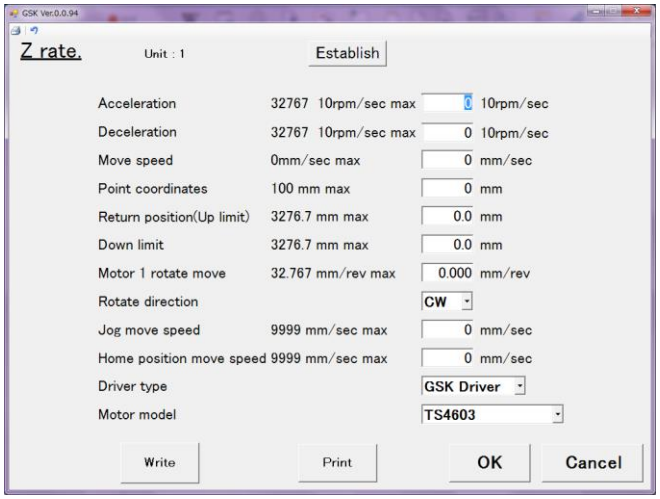
It determines that finished work, go to the next step.

・Adjacent interference distance value ①-⑯ (input range: 0 to 32767), adjacent interference distance effective X-axis that contains the specified adjacent interference distance, stops the Y-axis. Entered the adjacent interference distance, and outputs the "interference waiting abnormal" to the PLC exceeds the interference waiting abnormality of monitoring timer screen.

※Please refer to the controller of the specification about the contents of the adjacent interference distance.

4-2-4-2 Z axis





Z axis

・Z home position:(Home position PB) It will make the home position of the unit of XY number.

・Z servo condition It displays the servo state of the X-axis and Y-axis.

・Manual jog It moves upwards with "Up" button, and downwards with "Down" button. Activate while pressing the button, stop when you release the button.

Z rate

・Acceleration(Input range: 0 to 32767)

It sets the acceleration constant to reach the moving speed from the motor operation start.

・Deceleration (Input range: 0 to 32767)

It sets the deceleration constant that the motor reaches the operation stop from moving speed.

・Move speed(Input range: [“Motor 1 rotate move” * 75])

It sets the movement speed. “Motor 1 rotate move” is set under.

・Point coordinates(Input range: 0 to 100)

It sets the range to be detected as the point when you point output in the external communication output signal.

・Return position

It sets the Z axis home position. This setting means the rising limit point.

・Down limit

It sets the lower limit point.

・Motor 1 rotate move(Input range: 0 to 32.767)

It sets the distance that the positioning motor to move in one revolution.

The distance will change by those you want to use. So you set according to it

・Rotate direction　It sets the direction in which to work mechanically the positive side from the original position.

・Jog move speed　It sets the speed at which move in the manual JOG operation.

・Home position move speed　It sets the speed when you press the home position PB.

・Driver type　Please select the GSK driver.

・Motor model　Please select the motor type to use.

・Write　It displays the writing screen of Z rate. Set

・OK　It is to accept the changes and return to the XY point setting screen.

・Cancel　It erases the changes and return to the XY point setting screen.

4-2-5. **Timer setting**

You will select “Timer setting” from “Position setting menu”.

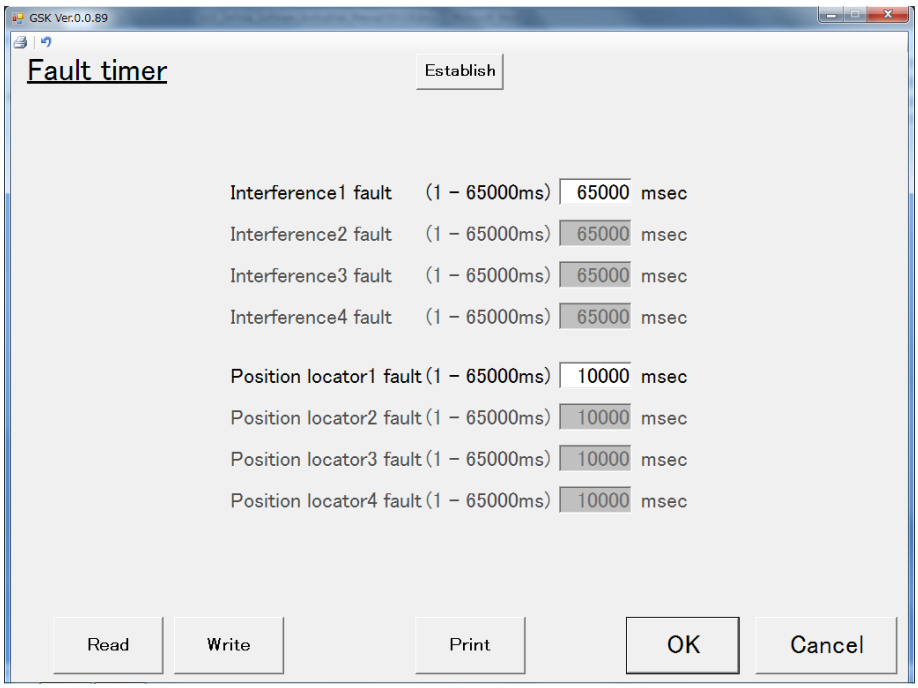


Fig (4-17): Timer setting

Interference fault ⇒ Set a time limit for the interference wait with other units. If even after this time during the automatic operation of the program operation is followed by interference waiting to ON outputs "interference waiting abnormal" to the PLC through an external communication such as M-net.

Positioning locator fault ⇒ In the program operation and JOG operation, X-axis even after the lapse of that time, if the position movement of the Y-axis is not complete, ON output "positioning abnormal" to the PLC through an external communication such as M-net.

- Interference 1 fault Set the interference waiting abnormality of the abnormal unit 1.
- Interference 2 fault Set the interference waiting abnormality of the abnormal unit 2.
- Interference 3 fault Set the interference waiting abnormality of the abnormal unit 3.
- Interference 4 fault Set the interference waiting abnormality of the abnormal unit 4.
- Positioning locator 1 fault Set the positioning abnormality of the abnormal unit1.
- Positioning locator 2 fault Set the positioning abnormality of the abnormal unit 2.
- Positioning locator 3 fault Set the positioning abnormality of the abnormal unit 3.
- Positioning locator 4fault Set the positioning abnormality of the abnormal unit 4.
- Establish It establish the change contents.
- Read It displays the loading screen of Timer setting
- Write It displays the writing screen of Timer setting
- Print It runs the printing of Timer setting
- OK It is to accept the changes and return to the position setting menu.
- Cancel It erases the changes and return to the position setting menu.

4-3. nut runner setting

You will select “nut runner setting” from “setting menu”

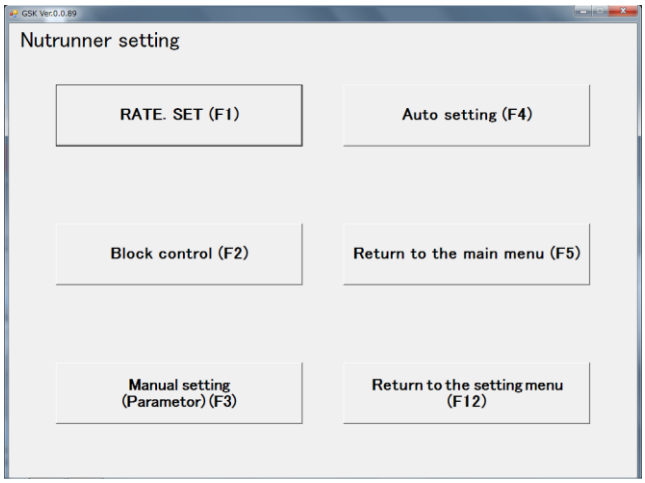


Fig (4-18): nut runner setting

- rate setting (F1) — Rated setting screen is indicated.
- block control (F2) — Block control screen indicated
- manual setting（tightening parameter setting）(F3) — Manual setting screen indicated.
- auto setting (F4) — Auto setting screen indicated.
- back to main menu(F5) — Back to main menu screen.
- back to setting menu(F12) — Back to setting menu screen.

4-3-1 rate setting

You will select “rate setting” from “nut runner setting”.

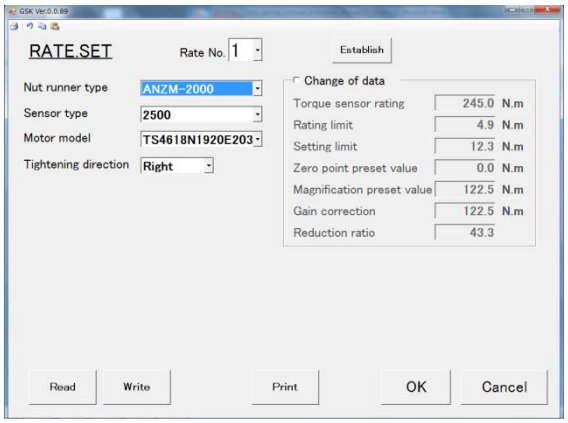


Fig (4-19): Rate setting

Nut runner type: You will select nut runner type.

※When the nut runner type is chosen, the sensor type and the motor type are shown to details to the right screen.

Sensor type: You will select torque sensor type.

※When the sensor type is chosen, it is shown to details to the right screen.

・Motor type: you will select motor type.

・details

- ・Torque sensor rate (Input area：0～6550) ⇒ The rated value of the torque sensor is established.
- ・Limit over (Input area：0 to 3276.7) ⇒ The value of the limit over is established.
- ・Set over (Input area：0 to 3276.7) ⇒ The value of the set over is established.
- ・Zero preset value (Input area：0 to 3276.7) ⇒ Zero preset value is established.
- ・Magnification preset value (Input area：0 to 3276.7) ⇒ The magnification preset value is established.
- ・Gain collection (Input area：0 to 3276.7) ⇒ The value of the gain collection is established.
- ・Gear ratio (Input area：0 to 9999) ⇒ The gear ratio of NR is established.

Note 1）It's only when the sensor type is OTHER, that the torque sensor rated value can be changed.

Note 2）It can't be established contrary to the following input regulation.

・limit over ＜ torque sensor rate ・set over ＜ torque sensor rate

・zero preset value ＜ torque sensor rate ・magnification preset value ＜ torque sensor rate

・gain collection ＜ torque sensor rate

Button

- ・fixation button ⇒ Change is fixed.
- ・setting read button ⇒ A rated reading screen is indicated.
- ・setting write button ⇒ A rated writing screen is indicated.
- ・print button ⇒ print of rate setting is executed.
- ・OK button ⇒ Change is fixed and back to nut runner setting.
- ・cancel button ⇒ Change is canceled and back to nut runner setting.

4-3-2. block control

You will select “block control” from “nut runner setting”.

It's necessary to make a block and allot to an axis to set tightening movement as a program.

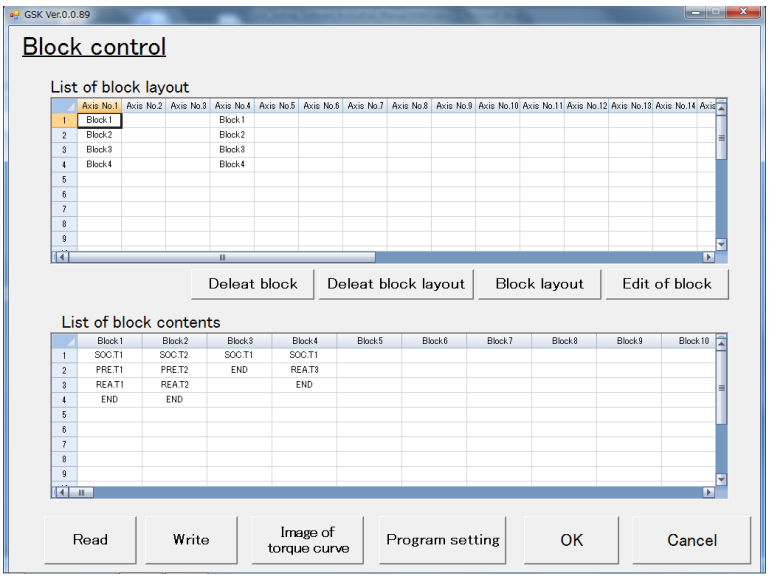


Fig (4-20): Block control

・Block allocation list ⇒ The block assigned to axis number is indicated.

・Block contents list ⇒ The block contents is indicated.

Button

・setting read button ⇒ A block control reading screen is indicated.

・setting write button ⇒ A block control writing screen is indicated.

・A corrugated image button ⇒ A corrugated image screen is indicated.

・program setting button ⇒ Program setting screen is indicated.

・OK button ⇒ Change is fixed and back to nut runner setting.

・cancel button ⇒ Change is canceled and back to nut runner setting.

・block elimination button ⇒ When the block where I'd like to eliminate a block list of the contents is designated, and a block elimination button is pressed, a block can be eliminated.

・Block allocation elimination button ⇒ When an axis of a block allocation list is designated and a block allocation elimination button is pressed, the block assigned to the axis is eliminated.

・Block allocation button ⇒ The block number can be allocated to an axis by “block allocation" button.

※It's possible to judge the present allocation by "block allocation list" of the screen upper part.

When a number is input to the cell a block allocation list chose, the block number of the number is input. When I'd like to put out the block number of the chosen cell, the block number of the axis to which even a "DEL" key and a "BACK SPACE" key are relevant can be eliminated.

・block edit button

⇒ The movement contents of the block number can be set as an axis by a block edit button.

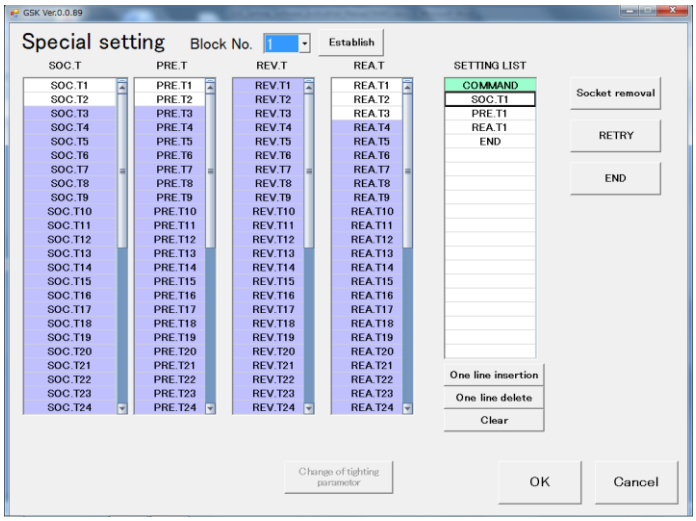


Fig (4-21): Block edit

When the respective setting numbers of the socket adjustment, the pre-tightening, the reverse rotation and final tightening are left-clicked, setting is reflected by setting information on the screen right side.

※When a choice cell of setting information is yellow, setting of the cell is overwritten.

When a choice cell of setting information is white, setting is inserted in front of the cell.

The change in the color can be changed by left-clicking the cell.

Note 1） The setting which is already input is a white cell. The cell by which setting is non-input becomes purple. Even if a cell of non-input is left-clicked, setting isn't inserted in setting information.

Note 2） When the setting which is already input (white) is left-clicked, the setting is inserted in setting information. When right-clicking, setting isn't inserted in setting information, and it's chosen. When using a "a tightening parameter change" button under the screen center, please use a right click.

※"Tightening parameter change" when a button is pressed, it moves to the screen to which the setting chosen at present can be changed.

Button

・fixation button ⇒ Change is fixed.

・socket remove button ⇒ The command of the socket removal is inserted in setting information.

※Please refer to a glossary of back of the book for the meaning of the socket removal.

The action uses setting number 50 of socket adjustment. The torque of the socket removal is based on setting of a controller. Please refer to instruction manual for controller.

・retry button ⇒ The command of the retry is inserted in setting information.

※Please refer to a glossary of back of the book about the meaning of the retry.

・1 line insertion button

⇒ The line of 1 line blank is inserted in front of the cell from which setting information is chosen.

・1 line deletion button ⇒ The one of the cell from which setting information is chosen is eliminated. The command after that moves to the front.

・all clear button ⇒ The command of the setting information, everything is cleared.

・Tightening parameter change button ⇒ It move to a chosen setting screen.

・OK button ⇒ Change is fixed and back to nut runner setting.

・cancel button ⇒ Change is canceled and back to nut runner setting.

4-3-3. Manual setting

You will select “manual setting “tightening parameter setting”” from “nut runner setting”.

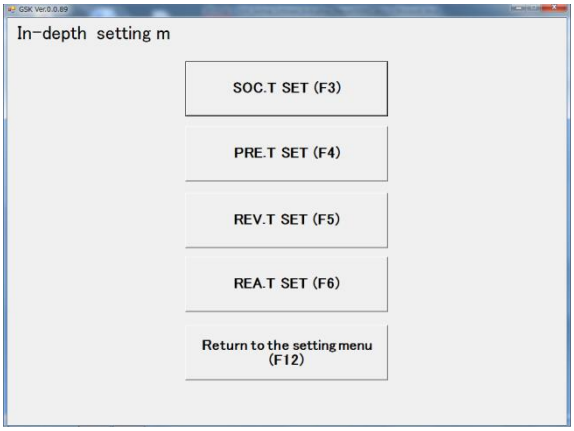


Fig (4-22): detail setting

・socket adjusting (F3) ⇒ socket adjusting setting screen is indicated.

・pre-tightening (F4) ⇒ pre-tightening setting screen is indicated.

・reverse rotation (F5) ⇒ reverse rotation setting screen is indicated.

・final tightening (F6) ⇒ final tightening setting screen is indicated.

・back to setting menu (F12) ⇒ back to setting menu

4-3-3-1.socket adjusting

You will select “socket adjusting” from “manual setting “tightening parameter setting”.

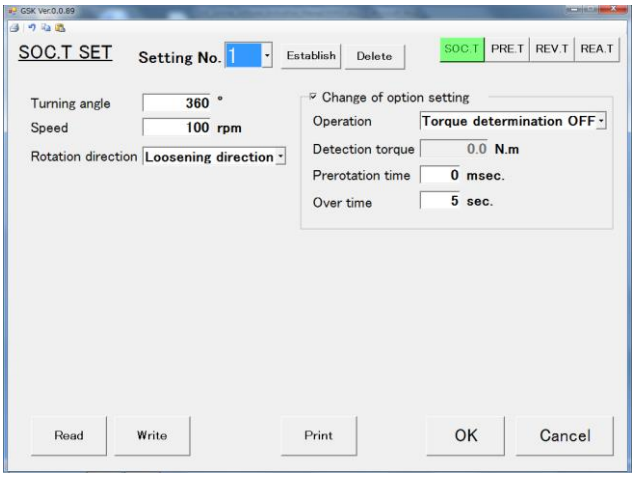


Fig (4-23): socket adjusting

※ You can move to "pre-tightening", "reverse rotation" and "final tightening" by a button of the upper right.

・rotation angle (input area：0 to 9999) ⇒ The degree of rotation angle at socket adjustment is established.

・speed (input area：0 to 9999) ⇒ The degree of speed at socket adjustment is established.

Option setting

・Movement

・without torque judgment ⇒ It isn't judged by the detection torque value.

・one shot reverse rotation ⇒ When monitoring torque reaches the detection torque value, movement is stopped.

・fitting ⇒ When monitoring torque doesn’t reach the detection torque value, movement is stopped.

・gear check ⇒ When monitoring torque reaches the detection torque value, movement is stopped and NG is indicated

・detection torque (input area：0 to 3276.7) ⇒ The detection torque value is established.

・before time (input area：0 to 9999) ⇒ Time until a revolution is begun is set.

・over time (input area：0 to 60)

⇒ The biggest time of the socket adjustment movement is set.

When movement doesn't end in this time, movement is ended and NG is judged.

Socket adjustment setting is checked the input of by the next condition. Over time＞1

※When the degree of rotation angle is zero, it's judged not to establish pre-tightening movement.

・fixation button ⇒ Change is fixed.

・elimination button ⇒ The price of the present setting number is returned to defaults.

・setting read button ⇒ A socket adjusting reading screen is indicated.

・setting write button ⇒ A socket adjusting writing screen is indicated.

・print button ⇒ Socket adjustment setting is printed.

・OK button ⇒ Change is fixed and back to nut runner setting.

・cancel button ⇒ Change is canceled and back to nut runner setting.

4-3-3-2.pre-tightening

You will select “pre-tightening” from “manual setting “tightening parameter setting”.

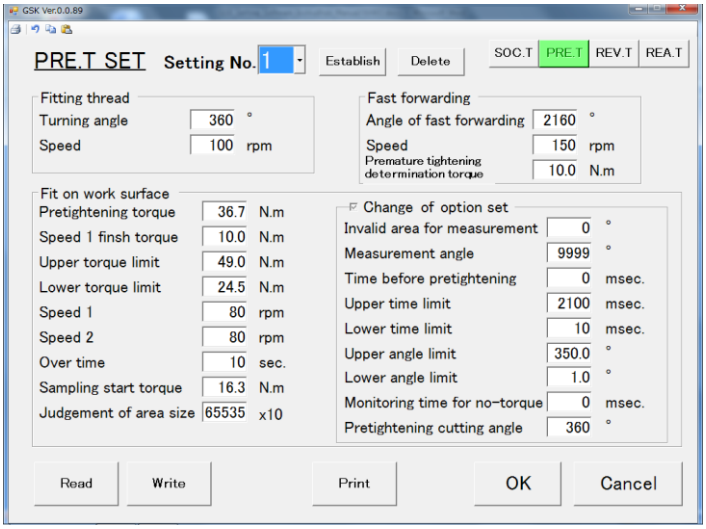


Fig (4-24): socket adjusting

※You can move to "socket adjusting", "reverse rotation" and "final tightening" by a button of the upper right.

・screw fitting（movement for screw fitting）

・rotation angle　(input area：0 to 9999)

⇒ The degree of rotation angle when moving of screw adjustment is established.

・speed (input area：0 to 9999)

⇒ The degree of speed when moving of screw adjustment is established.

・fast forwarding（movement for fast forwarding）

・fast forwarding angle (input area：0 to 9999)

⇒ The degree of rotation angle when moving of fast forwarding is established.

・speed (input area：0 to 9999)

⇒ The degree of speed when moving of fast forwarding is established.

・premature tightening determination torque (input area：0 to 3276.7)

⇒ The NG judged torque value is input at the fast forwarding.

・fit on work surface（movement for fit on work face）

・pre-tightening torque (input area：0 to 3276.7)

⇒ The torque value when ending movement during pre-tightening movement is established.

・speed1 finish torque (input area：0 to 3276.7) ⇒ The torque value when ending speed 1, is established.

・upper torque limit (input area：0 to 3276.7) ⇒ The torque value when torque over is established.

・lower torque limit (input area：0 to 3276.7) ⇒ The torque value when torque under is established.

・speed1 (input area：0 to 500) ⇒ The speed value at speed 1 is established.

・speed2 (input area：0 to 200) ⇒ The speed value at speed 2 is established.

・over time (input area：0 to 60)

⇒ The longest operating time of pre-tightening is set.

When movement doesn't end by this time, movement is ended and NG is judged.

・sampling start torque (input area：0 to 3276.7)

⇒ The torque value of time and angular measurement starting point is established.

・judgment of area size (input area：0 to 65535)

⇒ The area value used for judgment of screw badness is established.

Option

・invalid area for judgment (input area：0 to 9999) ⇒ The invalid area when measuring the area, is set.

・measurement angle (input area：0～9999) ⇒ The angle of the area is measured is set.

・before time (input area：0 to 65500)

⇒ The time lag until a pre-tightening order begins to revolve start is established.

・upper time (input area：0 to 65500)

⇒ Time upper limit value used for judgment in time is established after it'll be the measurement starting torque.

・lower time (input area：0 to 65500)

⇒ Time lower limit value used for judgment in time is established after it'll be the measurement starting torque.

・upper angle (input area：0 to 999.9)

⇒ Angle upper limit value used for judgment in angle is established after it'll be the measurement starting torque.

・lower angle (input area：0 to 999.9)

⇒ Angle lower limit value used for judgment in angle is established after it'll be the measurement starting torque.

・monitoring time for no torque (input area：0 to 65500) ⇒ The time which isn't measured torque value is set.

・pre-tightening cutting angle (input area：0 to 9999)

⇒ The most movement angle of the pre-tightening is set. When it's this angle, movement is ended.

Pre-tightening setting is checked the input of by the next condition.

※When the degree of speed1 speed2 are zero, it's judged not to establish pre-tightening movement.

So it doesn't check the input.

・over time＞1 ・fast forwarding angle＞rotation angle ・upper torque limit＞lower torque limit

・upper time limit＞lower time limit ・upper angle limit＞lower tangle limit

・pre-tightening torque＞sampling start torque ・upper torque limit＞pre-tightening torque＞lower torque limit

Button

・fixation button ⇒ Change is fixed.

・elimination button ⇒ The price of the present setting number is returned to defaults.

・setting read button ⇒ A pre-tightening reading screen is indicated.

・setting write button ⇒ A pre-tightening writing screen is indicated.

・print button ⇒ Pre-tightening setting is printed.

・OK button ⇒ Change is fixed and back to nut runner setting.

・cancel button ⇒ Change is canceled and back to nut runner setting.

4-3-3-3.reverse rotation

You will select “reverse rotation” from “manual setting “tightening parameter setting”.

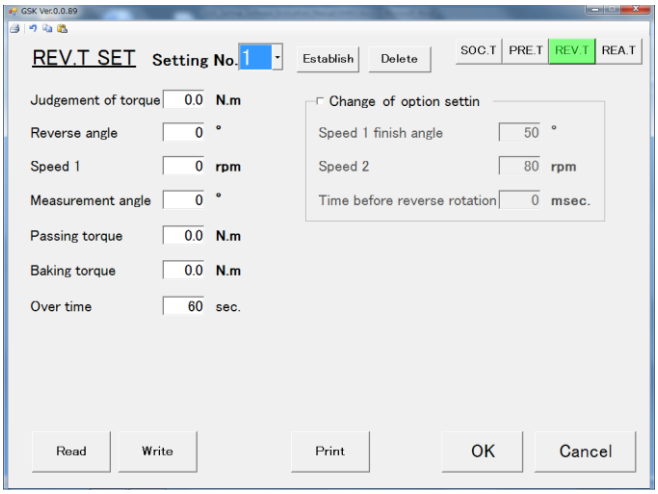


Fig (4-25): reverse rotation

※You can move to "socket adjusting", "pre-tightening" and "final tightening" by a button of the upper right.

・judgment torque (input area：0 to 3276.7) ⇒ The torque value for judgment of screw badness is established .

・reverse angle (input area：0 to 9999) ⇒ The movement angle when reversing, is established.

・speed1 (input area：0 to 9999) ⇒ The speed value at speed 1 is established.

・measurement angle (input area：0 to 9999)

⇒ The measurement angle for judgment of screw badness is established.

・passing torque (input area：0 to 3276.7)

⇒ The passing torque for judgment of socket-in badness is established.

・baking torque (input area：0 to 3276.7)

⇒ The baking torque for judgment of pre-tightening badness is established.

・over time (input area：0 to 60)

⇒ The longest operating time of reverse rotation is set.

When movement doesn't end by this time, movement is ended and NG is judged.

Option

・speed1 finish angle (input area：0 to 9999)

⇒The angle when switching over from the 1st speed to the 2nd speed is set.

・speed2 (input area：0 to 9999) ⇒ The speed value at speed 2 is established.

・before time (input area：0 to 65500) ⇒ Time until the reverse is begun is established.

Reverse rotation setting is checked the input of by the next condition.

※When the degree of reverse angle is zero, it's judged not to establish reverse rotation movement.

So it doesn't check the input.

・over time＞1 ・reverse angle＞measurement angle ・reverse angle＞ speed1 finish angle

Button

- fixation button ⇒ Change is fixed.
- elimination button ⇒ The price of the present setting number is returned to defaults.
- setting read button ⇒ Reverse rotation reading screen is indicated.
- setting write button ⇒ Reverse rotation writing screen is indicated.
- print button ⇒ Reverse rotation setting is printed.
- OK button ⇒ Change is fixed and back to nut runner setting.
- cancel button ⇒ Change is canceled and back to nut runner setting.

4-3-3-4.final tightening

You will select “final tightening” from “manual setting “tightening parameter setting””

Final tightening－torque control ”The setting screen when final tightening mode is torque control”

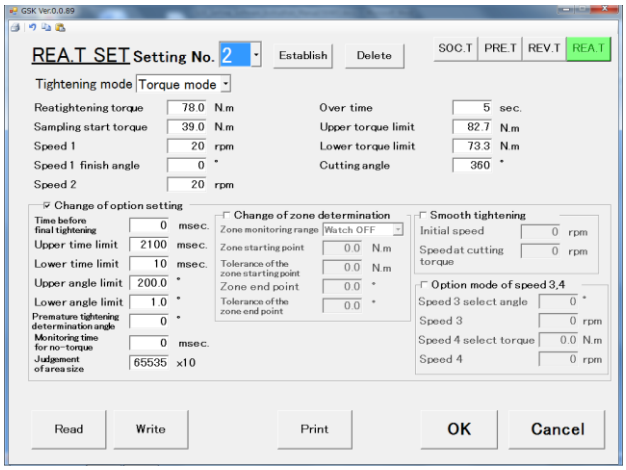


Fig (4-26): final tightening (torque control)

※You can move to "socket adjusting", "pre-tightening" and "reverse rotation" by a button of the upper right.

- real-tightening torque (input area：0 to 3276.7)
  ⇒ The torque value when ending movement during final tightening movement is established.
- sampling start torque (input area：0 to 3276.7)
  ⇒ The torque value of time and angular measurement starting point is established.
- speed1 (input：0 to 9999) ⇒ The speed value at speed 1 is established.
- speed1 finish angle (input area：0 to 9999)
  The angle when switching over from the 1st speed to the 2nd speed is established.
- speed2 (input area：0 to 999) ⇒ The speed value at speed 2 is established.
- over time (input area：1 to 60) ⇒ The longest operating time of final tightening is set.
  When movement doesn't end by this time, movement is ended and NG is judged.
- upper torque limit (input area：0 to 3276.7) ⇒ The torque value when torque over is established.
- lower torque limit (input area：0 to 3276.7) ⇒ The torque value when torque under is established.
- cutting angle (input area：0 to 9999) ⇒ The most movement angle of the final tightening is set.
  When it's this angle, movement is ended.

Option

・before time (input area：0 to 65500)　The time lag until a real-tightening order begins to revolve start is established.

・upper time limit (input area：0 to 65500)

⇒Time upper limit value used for judgment in time is established after it'll be the measurement starting torque.

・lower time limit (input area：0 to 65500)

⇒Time lower limit value used for judgment in time is established after it'll be the measurement starting torque.

・upper angle limit (input area：0 to 999.9)

⇒ Angle upper limit value used for judgment in angle is established after it'll be the measurement starting torque.

・lower angle limit (input area：0 to 999.9)

⇒ Angle lower limit value used for judgment in angle is established after it'll be the measurement starting torque.

・premature tightening determination angle (input：0 to 9999)

⇒The NG judged angle value is input at the fast forwarding.

・monitoring time for no torque (input area：0 to 65500)　⇒ The time which isn't measured torque value is set.

・judgment of area size (input area：0 to 65535)

⇒The area value used for judgment of screw badness is established.

・zone determination

・zone monitoring range

“watch off”　⇒　Zone judgment isn't done.

“lower off”　⇒　A lower limit isn't judged at the time of a zone judgment.

“upper off”　⇒　A upper limit isn't judged at the time of a zone judgment.

“watch on”　⇒　A lower limit and a upper limit is judged at the time of a zone judgment.

・zone starting point (input area：0 to 3276.7)　The torque value which begins zone judgement is established.

・tolerance of the zone starting point (input area：0 to 3276.7)

⇒The torque value and the common difference which are at the start of zone judgment are established.

・zone end point (input area：0 to 999.9)

⇒The angle of end point from start point of zone judgment is established.

・tolerance of the zone end point (input area：0 to 999.9)

⇒The angle value and the common difference which are at the end of zone judgment are established.

・smooth tightening

・initial speed (input area：0 to 9999)　⇒　The speed which is at the start of smoothing tightening is established.

・speed at cutting torque (input area：0 to 9999)　⇒　The speed when reaching the cut torque of　is established.

Even the last speed will go down gradually from the speed of initials according to the torque change for the speed until the tightening torque reaches the cut torque.

・option mode of speed3,4

・speed 3 select angle (input area：0 to 9999)

⇒ The angle when switching over from the 2nd speed to the 3rd speed is established.

・speed 3 (input area：0 to 9999)　⇒　The speed value at speed 3 is established.

・speed 4 select torque (input area：0 to 3276.7)

⇒ The torque when switching over from the 3rd speed to the 4th speed is established.

・speed 4 (input area：0 to 9999) ⇒ The speed value at speed 4 is established.

Final tightening “torque control mode” setting is checked the input of by the next condition.

※When the degree of tightening angle is zero, it's judged not to establish final tightening movement.

So it doesn't check the input.

・over time＞1 ・upper torque limit＞lower torque limit ・upper time limit＞lower time limit

・upper angle limit＞lower tangle limit ・upper torque limit＞real-tightening torque＞lower torque limit

・initial speed＞speed at cutting torque

Button

・elimination button ⇒ The price of the present setting number is returned to defaults.

・setting read button ⇒ Final tightening reading screen is indicated.

・setting write button ⇒ Final tightening writing screen is indicated.

・print button ⇒ Final tightening setting is printed.

・OK button ⇒ Change is fixed and back to nut runner setting.

・cancel button ⇒ Change is canceled and back to nut runner setting.

Final tightening－angle control ”The setting screen when final tightening mode is angle control”

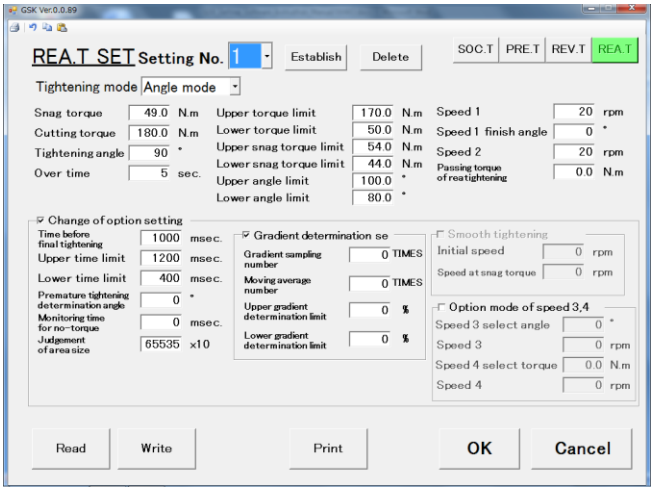


Fig (4-27): final tightening (angle control)

※ You can move to "socket adjusting", "pre-tightening" and "reverse rotation" by a button of the upper right.

・snag torque (input area：0～3276.7) ⇒ Snag torque value which begins angle control is established.

・cutting torque (input area：0～3276.7)

⇒ The torque value when ending movement during final tightening movement is established.

・tightening angle (input area：0～9999)

⇒ The angle value when ending movement during final tightening movement is established.

・over time (input area：0～60) ⇒ The longest operating time of final tightening is set.
When movement doesn't end by this time, movement is ended and NG is judged.

・upper torque limit (input area：0 to 3276.7) ⇒ The torque value when torque over is established.

・lower torque limit (input area：0 to 3276.7) ⇒ The torque value when torque under is established.

・upper snag torque limit (input area：0 to 3276.7) ⇒ The snag torque value when torque over is established.

・lower snag torque limit (input area：0 to 3276.7) ⇒ The snag torque value when torque under is established.

・upper angle limit (input area：0 to 999.9)

⇒ Angle upper limit value used for judgment in angle is established after it'll be the snag torque.

・lower angle limit (input area：0 to 999.9)

⇒ Angle lower limit value used for judgment in angle is established after it'll be the snag torque.

・speed1 (input：0 to 9999) ⇒ The speed value at speed 1 is established.

・speed1 finish angle (input area：0 to 9999)

⇒ The angle when switching over from the 1st speed to the 2nd speed is established.

・speed2 (input area：0 to 999) ⇒ The speed value at speed 2 is established.

・passing torque of real tightening (input area：0 to 3276.7)

⇒ The torque value when judging socket removal abnormality, is established.

Option

・before time (input area：0 to 65500)

⇒ The time lag until a real-tightening order begins to revolve start is established.

・upper time limit (input area：0 to 65500)

⇒ Time upper limit value used for judgment in time is established after it'll be the snag torque.

・lower time limit (input area：0 to 65500)

⇒ Time lower limit value used for judgment in time is established after it'll be the snag torque.

・premature tightening determination angle (input：0 to 9999)

⇒ The NG judged angle value is input at the fast forwarding.

・monitoring time for no torque (input area：0 to 65500) ⇒ The time which isn't measured torque value is set.

・judgment of area size (input area：0 to 65535)

⇒ The area value used for judgment of screw badness is established.

・gradient determination

・gradient sampling number (input area：0 to 99) The sampled number per the once is established.

・moving average number (input area：0 to100)

The number which is every 0.5 degree and acquires data is established.

・upper gradient determination limit (input area：0 to 100)

The upper limit value of gradient determination is established.

・lower gradient determination limit (input area：0 to 100)

The upper limit value of gradient determination is established.

・smooth tightening

・initial speed (input area：0 to 9999)　⇒　The speed which is at the start of smoothing tightening is established.

・speed at cutting torque (input area：0 to 9999)　⇒　The speed when reaching the cut torque of　is established.

Even the last speed will go down gradually from the speed of initials according to the torque change for the speed until the tightening torque reaches the cut torque.

・option mode of speed3,4

・speed 3 select angle (input area：0 to 9999)

⇒ The angle when switching over from the 2nd speed to the 3rd speed is established.

・speed 3 (input area：0 to 9999)　⇒　The speed value at speed 3 is established.

・speed 4 select torque (input area：0 to 3276.7)

⇒ The torque when switching over from the 3rd speed to the 4th speed is established.

・speed 4 (input area：0 to 9999)　⇒　The speed value at speed 4 is established.

Final tightening “angle control mode” setting is checked the input of by the next condition.

※When the degree of tightening angle is zero, it's judged not to establish final tightening movement.
So it doesn't check the input.

・over time＞1　・upper torque limit＞lower torque limit　・upper time limit＞lower time limit

・upper angle limit＞lower tangle limit　・upper torque limit＞real-tightening torque＞lower torque limit

・initial speed＞speed at cutting torque

4-3-4.auto setting

You will select “auto setting” from “nut runner setting“

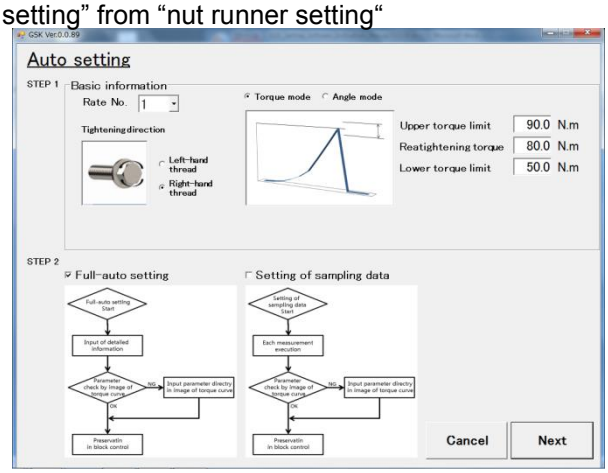


Fig (4-28): auto setting

STEP1：

As basic information, it's necessary to input rated number of NR, choice of control mode(torque control or angle control) upper torque limit, cutting torque and lower torque limit.

STEP2：

It is established full-auto setting or setting of sampling data is chosen.

・Full-auto setting ⇒ Setting parameter is made by data inputting.

(The screw kind, the distance until the taking a seat and inclusion)

・Setting of sampling data ⇒ Setting parameter is made by data which actual tightening is performed.

4-3-4-1. full-auto setting

"Full-auto setting" is chosen by "auto setting", and, "next", when it's pushed, it'll be a full-auto setting screen.

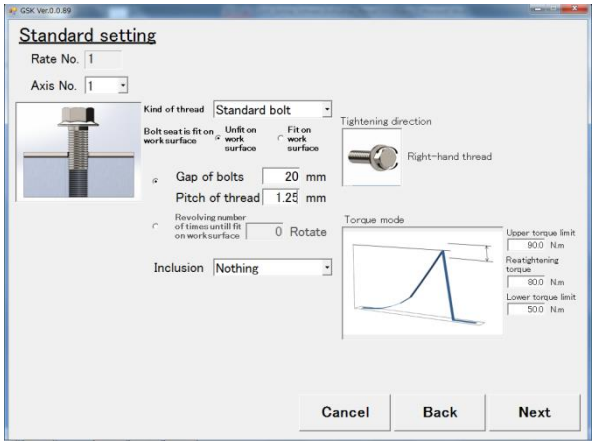


Fig (4-29): full-auto setting

※Please refer to "9-3 tightening program" for a flow chart.

Input axis number, the screw kind, the bolt kind and inclusion, and next is developed, "next", it's clicked.

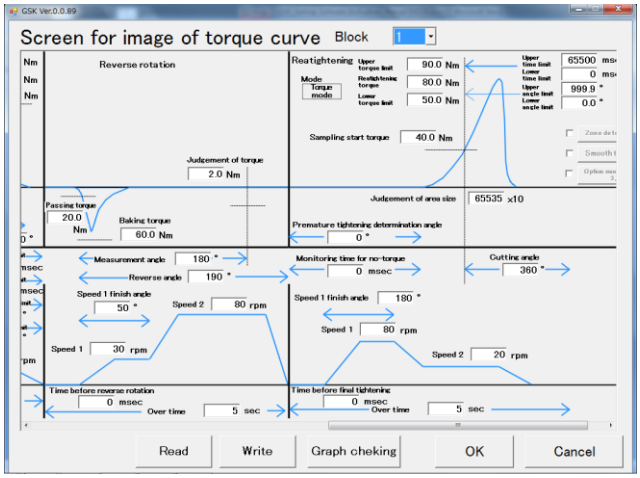


Fig (4-30): Screen for image of torque curve

Please confirm the setting on the screen for image of torque curve. When you'd like to change the setting, the parameter is changed on the screen, and OK is pushed, it's fixed.

4-3-4-2.setting of sampling data

"Setting of sampling data" is chosen by "auto setting" and "next", when it's pushed, it'll be a sampling setting screen.

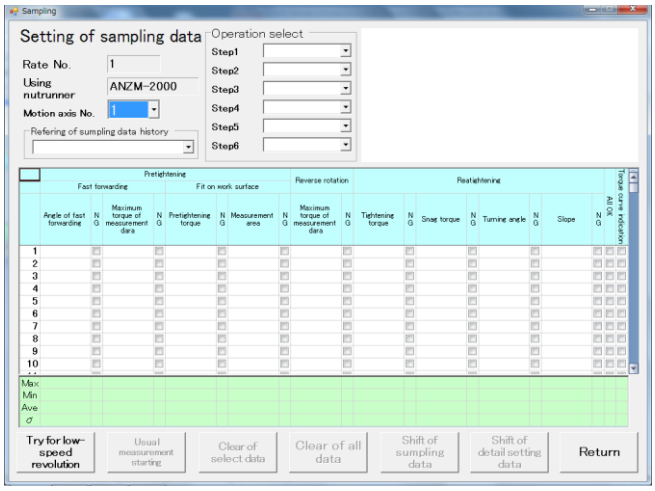


Fig (4-31): Setting of sampling data

※Please refer to "9-3 tightening program" for a flow chart.

The angle until the taking a seat is gauged with a low-speed revolving try.

Please choose movement axis number and set it in the state until a bolt is tightened up. Please press a low-speed revolving try button including driving preparations at the tightening starting position.

The angle until the taking a seat of a screw is measured by pressing a low-speed revolving try button. After that it revolves by the speed of the 40RPM, and when I reach "the tightening sampling stop torque", stops. The degree of general rotation angle from a start to the stop of that case is measured.

About 1.5 times more than the degree of rotation angle measured after tightening is reversed and the movement which slackens a screw is performed, and it's a movement end.

During moving, following message goes out.

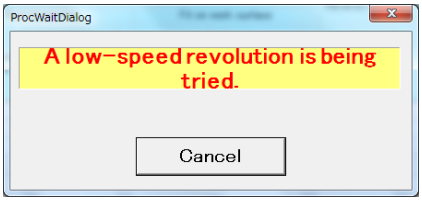


Fig (4-32): processing of low revolution try

Please establish the "tightening sampling stop torque" of the controller before a low-speed revolving try.
It's 0, so if it's just as it is, defaults don't circulate at low speed.
When or the operation time exceeds 60 seconds when not reaching "tightening sampling stop torque" even if it revolves 9999 times during a try, a controller takes out an alarm "E33".
The data for which setting is made with a measurement starting button is acquired. When a step is chosen by movement choice and a measurement starting button is pressed, the setting value and the program originated with the data a low-speed revolving try gave are sent to the controller.
Please carry out the following program number by a PLC after a measurement starting button is pressed.

※The program made with a low-speed revolving try is preserved by the last program number.

The number of program changes with the program Max value choice in the following.

30axis, 16program, 220steps ⇒ program number：16
30axis, 50program, 70steps ⇒ program number：50
8axis, 50program, 220steps ⇒ program number：50

The setting made with a low-speed revolving try starts to be the next.
Socket adjusting is 47-49, pre-tightening is 50 reverse rotation is 50 and final tightening is 50. f
During beginning to measure, following message goes out. Only that it's necessary, please execute a program. If data is acquired, it "now sampling", please press a cancellation button of the window of a message.

Fig (4-33): now sampling

If I finish acquiring data as much as it's necessary by measurement starting, a cancellation button is pressed.
When making the set value with acquired data, excluded data is chosen by "NG" and the data acquired by a "sampling data, shifting" button after that is preserved in the setting PC.
When you'd like to set setting in a block, a in-depth setting data shift button is pressed.
When you'd like to gauge with the set value which was made with acquired data, a measurement starting button is usually pressed. The screen upper right develops and is corrugated.

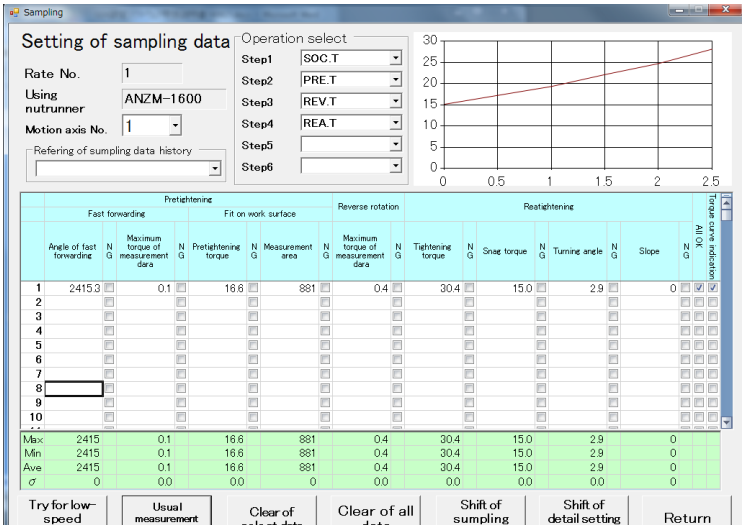


Fig (4-34): Setting of sampling data after measurement

It's to press an in-depth setting data shift button, moves to a corrugated image screen and indicates a block of the made set value. Information on the block is preserved by a setting PC by pushing OK.

※The made block number is the first block number which isn't being used.

It's also possible by screen for image of torque to change the set value.

。

4-4. Program setting

You will select “Program setting” from “Setting menu”.

When you select a program setting from the Settings menu will come out the screen to select the "program Max value selection". This is because the amount of data that can be stored in the controller is limited, choose how allocate it.

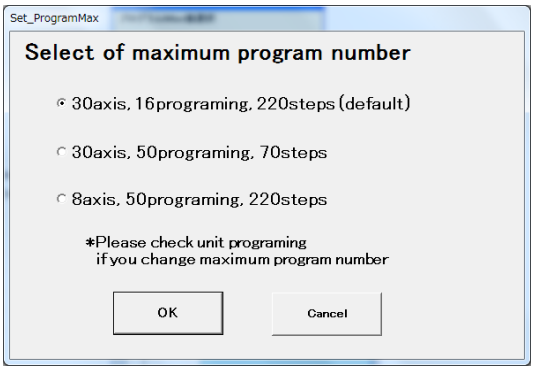


Fig (4-35): Program Max value selection

Usually, please choose the default of "30 axis, 16 program No, 220-step".

If you change the program Max value selection, the program must be re-created.

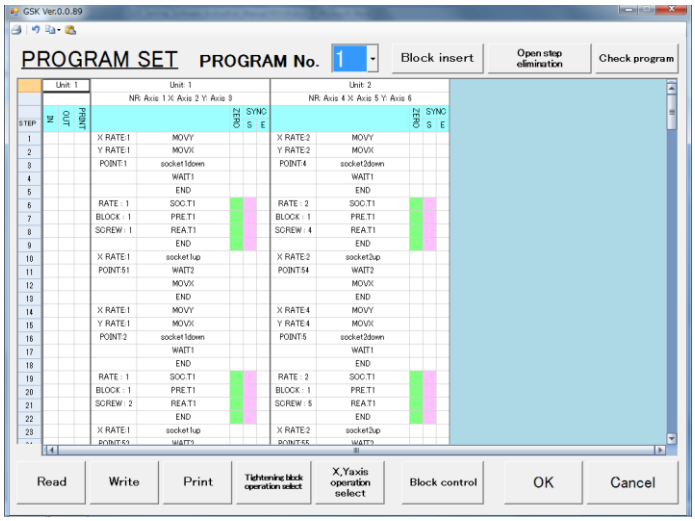


Fig (4-36): Program setting

・IN

"IN" signal to become ON from the PLC will perform the following steps.

・OUT

It outputs "OUT" signal to the PLC once you have run that step.

“OUT "signal is turned OFF when you come from the next" in "signal PLC.

・PRINT

It will print the contents of which are specified in the printer that is connected to the controller After you run the step.

・Program area　It displays the contents of the set with a program.

・ZERO　It will show whether the zero-fold check to the step has been set.

・SYNC/S　It will show whether the start synchronization with the step has been set.

・SYNC/E　　It will show whether the synchronization end to that step has been set.

・Block insert　　It will insert an empty block in front of the cell that has been selected.

・Open step elimination　　It fills remove the blocks that are vacant axis that is selected.

・Check program

It is the configuration operation and the block a block of programs that have been selected in the program number is registered to check the same.

・Read　　It displays the loading screen of program setting.

・Write　　It displays the writing screen of program setting.

・Print　　It runs the printing of program setting.

・Block control　　It displays the block management screen.

・OK　　It is to accept the changes and return to the setting menu.

・Cancel　　It erases the changes and return to the setting menu.

・Tightening block operation select

The program setting screen, you can select the block to be inserted into the program in the "_Tightening block operation select " button.

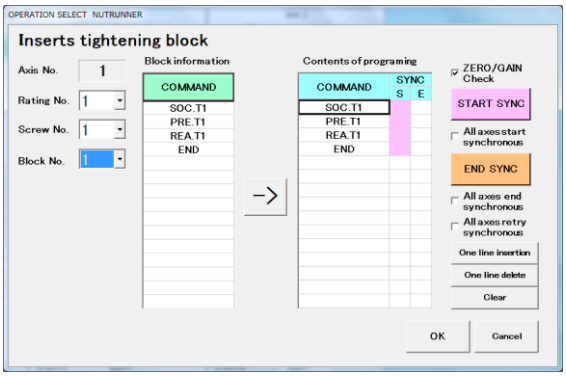


Fig (4-37): Tightening block insert

・Rate number　　It specifies the rated number of NR to be used.

・Screw number　　It specifies the screws number to tighten.

・Block No.　　It specifies the block No. to be used.

・→　It is registered as a tightening block to insert the block information that is currently selected in the program.

・Zero/magnification check

Before block operation is started, you put a zero/magnification check is a check function of the torque sensor.

・Start synchronization

It is to synchronize the next to step in between the units. It is effective only when there is a XY to the unit.

Even if XY is not in the unit and put the start synchronization, even if not put to synchronize.

・All axes start synchronization

It place the start synchronization for all axes in the unit。※You can see that entering the program.

・End synchronization　　Valid only tighten ※ steps of the present tightening after this tightening

・All axes end synchronization　　Put all axes end synchronization for all axes in the unit. ※ You can see that all axes end synchronization to enter the program.

・All axes retry　　It is valid only when the retry in the block has been selected

※ If there is NG even one axis when it comes to all axes retry, and all axes retry processing. Please look at the end of a book about the retry details.

・XY axis operation select

The program setting screen to choose from the command of the XY behavior that you want to set in the "XY-axis operation select" button, you can insert into the program.

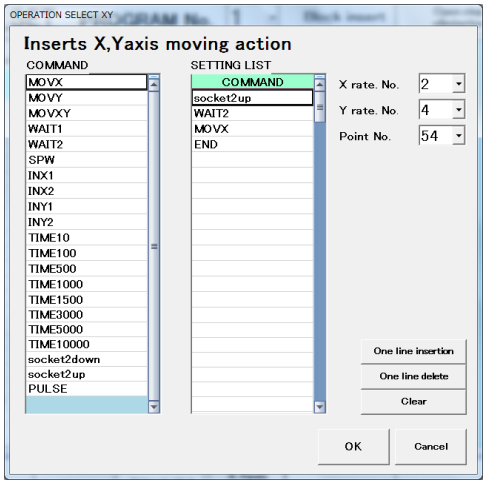


Fig (4-38): XY actions insert

※Please refer to the controller instruction manual for XY operation command.

・X rate number　　It specify the X rate number of XY operation.

・Y rate number　　It specify the Y rate number of XY operation.

・Point number　　It specifies the point number of XY operation (specified number of reaching the coordinates of the XY operation).

・One line insertion

It inserts a line of empty cell in front of the cell that has been selected in the configuration information.

・One line delete　　It is filled to remove the cell that has been selected in the configuration information.

・Clear　　It clears all the contents of the configuration information.

・OK　　It is to accept the changes and return to the program setting.

・Cancel　　It erases the changes and return to the program setting.

4-5. Setting reading and setting the writing of each setting screen

We summarized for setting writing and setting reading of each setting screen in the Setting menu.

The following describes based on the reading of the rate setting.

Since there is no such set number for details on the cylinder name and timer setting and the unit and the data output and the option tightening, there is no reading and writing of the specified number.

4-5-1. each setting read

You read the settings from a file or a controller.

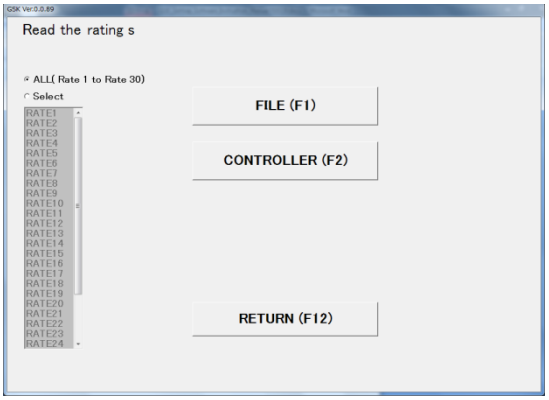


Fig (4-39): Setting read screen

・ALL(Rate 1 to Rate 30） It is set to all of the reading target.

・Select It will select the setting to read.

If you specify a selection option, it allows you to select a list BOX of each setting.

・File(F1) You read the settings from the file.

・Controller(F2)

It will read each setting from GSK controller. If you read the configuration file from the GSK controller, the controller and computer must be connected by a USB cable.Communication error occurs when not connected.

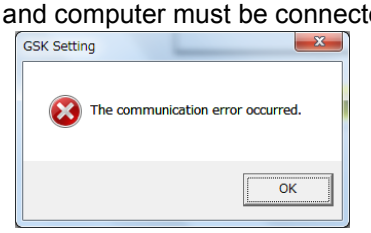


Fig (4-40): Communication error

・Return(F12) It will return to the setting screen.

1. File

In the file processing, HD (hard disk) or, over the file on the other accessible media, we read each setting information.

Configuration files are saved with the file extension of each setting.

Rate：GSKT、SOC.T：GSKR、PRE.T：GSKK、REV.T：GSKG、REA.T：GSKH、
Screw No.：GSKJ、Block control：GSKB
Cylinder name：GSKCN、X rate：GSKXT、Y rate：GSKYTP、Timer setting：GSKST
Unit：GSKU、Tightening data output：GSKOT、Option：GSKOP

In the selection of reading files, please select the file extension of each setting.

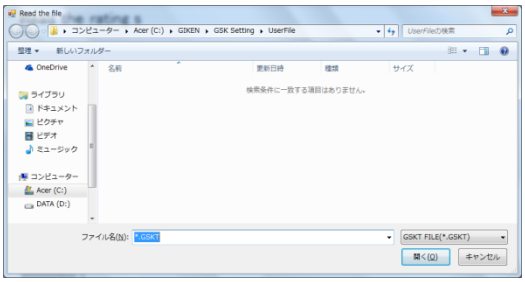


Fig (4-41): Reading file selection

It uses the file selection dialog, select the settings file to be loaded.

When the reading of each configuration file is complete, the following message is displayed.

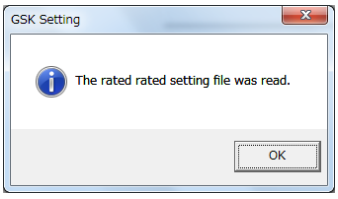


Fig (4-42): Read complete message

② Controller

It will read each setting from GSK controller.

If you read the configuration file from the GSK controller, the controller and computer must be connected by a USB cable. Communication error occurs when not connected.

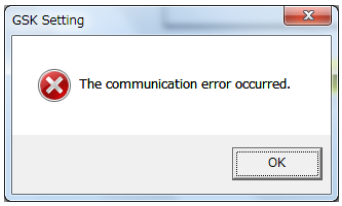


Fig (4-43): Communication error

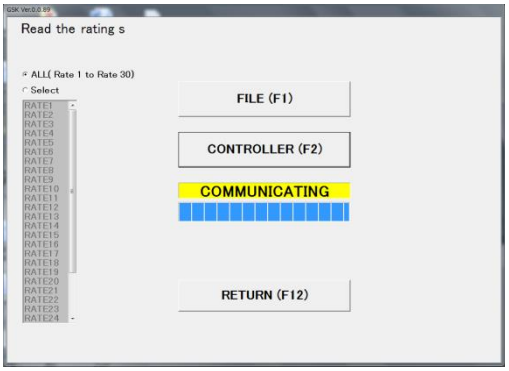


Fig (4-44): Reading files from the folder

When the reading from the controller is finished, the following message appears.

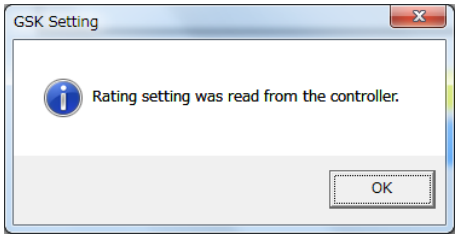


Fig (4-42): Read complete message from controller

③ Selection the read file

If you want to read the specification of the set only, choose a selection option. Please select the specified setting because list BOX will be selected. When you press the file button, you read only the specified settings from the file. When you press the controller buttons, you read only the specified settings from GSK controller.

※Since there is no set number for the cylinder name and timer setting and the unit and the data output and the option, you cannot read only the specified settings.

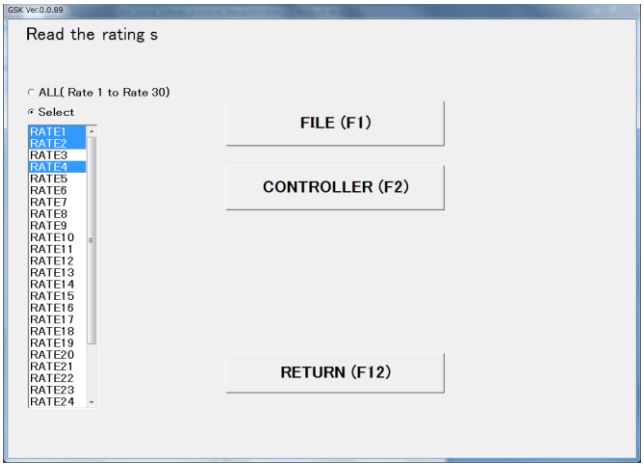


Fig (4-46): Setting select

4-5-2.Each setting write

It will write the settings file, or, to the controller.

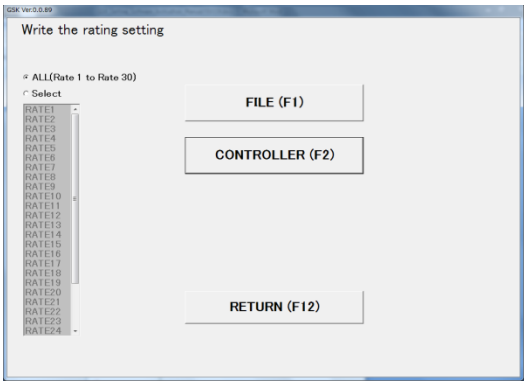


Fig (4-47): Setting write screen

・ALL(Rate 1 to Rate 30） It is set to all of the writing target.

・Select It will select the setting to write.

If you specify a selection option, it allows you to select a list BOX of each setting.

・File(F1) You write the settings from the file.

・Controller(F2)

It will write each setting from GSK controller. If you write the configuration file from the GSK controller, the controller and computer must be connected by a USB cable.Communication error occurs when not connected.

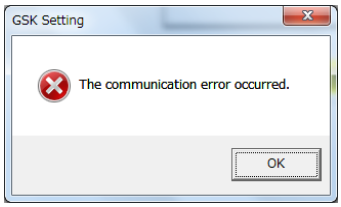


Fig (4-48): Communication error

・Return(F12) It will return to the setting screen.

① File

In the file processing, HD (hard disk) or, to a file on the other accessible media, writes each configuration information. Configuration files are saved with the file extension of each setting.

Please refer to 4-5-1 for the extension.

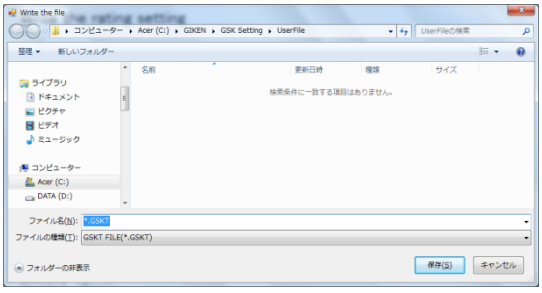


Fig (4-48): Writing file named

You will use the file selection dialog, and name to write the configuration file.

When the writing of the configuration file is complete, the following message is displayed.

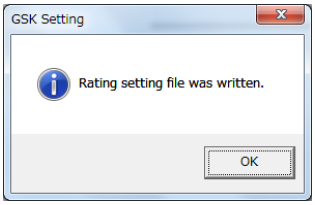


Fig (4-50): Writing complete message

② Controller

It will write each setting from GSK controller.

If you write the configuration file from the GSK controller, the controller and computer must be connected by a USB cable.Communication error occurs when not connected.

The password to write to the controller is required. (Initial Password: 2014)

If the password is unknown, the configuration file cannot be written to the controller.

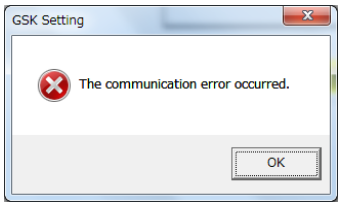


Fig (4-51): Communication error

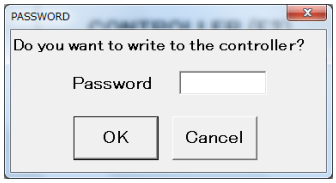


Fig (4-52): Password confirmation

Please OFF the operation preparation.

It cannot be written the configuration file when you don't turn OFF the operation ready.

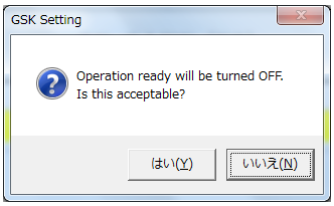


Fig (4-53): Operation ready OFF confirmation

When writing to the controller is finished, the following message appears.

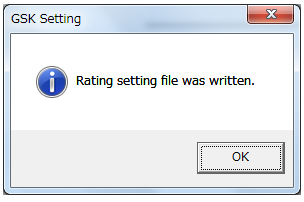


Fig (4-54): Writing complete message to controller

③ Selection the write file

If you want to write the specification of the set only, choose a selection option. Please select the specified setting because list BOX will be selected. When you press the file button, you write only the specified settings to the file.

When you press the controller buttons, you write only the specified settings to GSK controller.

※Since there is no set number for the cylinder name and timer setting and the unit and the data output and the option, you cannot write only the specified settings.

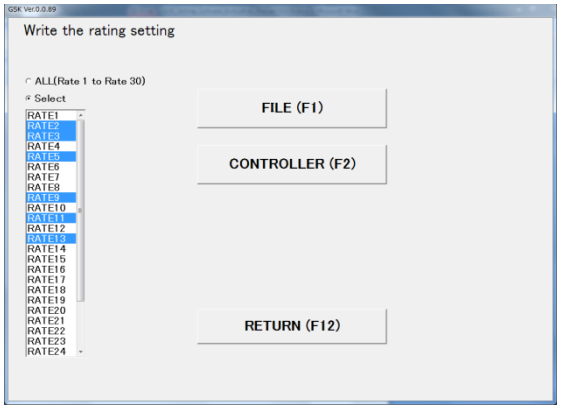


Fig (4-55): Setting select

5. Auto measurement

You will select “Auto measurement” from “Main menu”.

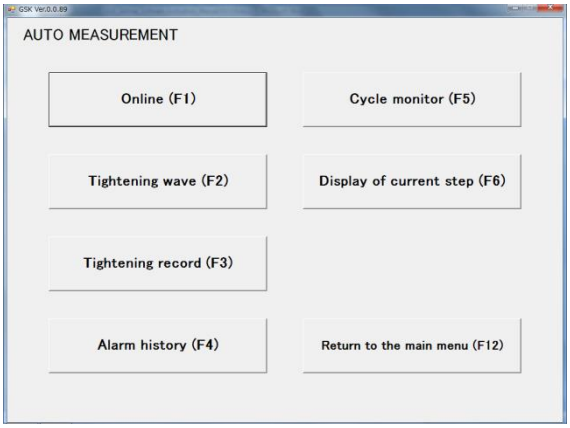


Fig (5-1): Auto measurement menu

・Online (F1)	It will show the tightening results in real time.
・Tightening wave (F2)	You can see a tightening waveform.
・Tightening record (F3)	You can view the tightening history that is stored in the controller.
・Alarm history(F4)	You can view the alarm history that is stored in the controller.
・Cycle monitor (F5)	You can monitor the signal between the PLC and the controller.
・Display of current step (F6)	The operation will be able to monitor whether any step of the program.
・Return to the main menu (F12)	To return to the main menu.

5-1. Online

You will select “Online” from “Auto measurement menu”.

It displays the online screen. You will receive the tightening results at any time from the controller and displays it.

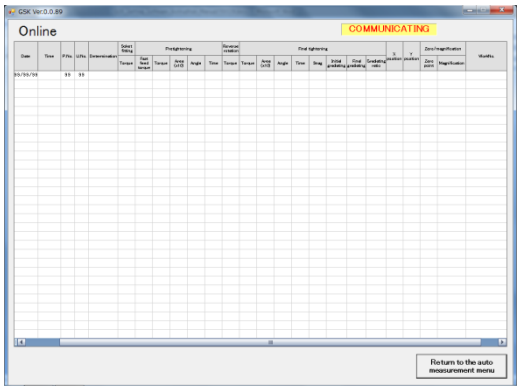


Fig (5-2): Auto measurement menu

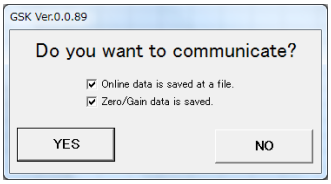


Fig (5-3): Communication confirmation

If you want to save the tightening results automatically, please check the "Online data is saved at a file".

Also, if you want to save the zero-fold data automatically, please check the "Zero/Gain data is saved".

※The file of the tightening result is stored in the " C:¥GIKEN¥GSK Setting¥AutoMeasurement¥OnLine ".

※The file of the Zero / magnification data is stored in the " C:¥GIKEN¥GSK Setting¥AutoMeasurement¥ZeroGain ".

- Axis No. It displays the axis number.
- Screw No. It displays the screw number.
- Data It displays the date at the time of tightening is complete.
- Time It displays the time when the tightening is complete.
- P.No. It displays the program number.
- U.No. It displays the Unit number.
- Determination It displays the results at the time of the OK and NG as follows: OK: ○, NG: X.
- Socket fitting/ torque It displays the torque at the time of the socket fitting end. Unit is “Nm”.
- Pre-tightening/Fast feed torque

When NR is turned until the early tightening angle, it displays the maximum torque value within the interval of fast forward. Unit is “Nm”.

When NR isn’t turned until the early tightening angle, it displays zero “Nm”.

- Pre-tightening/Torque It displays the torque at the time of the pre-tightening end. Unit is “Nm”.
- Pre-tightening/Area(X10) Judgment area in the graph of angle and torque, is the integral value of the torque waveform.

The display value is 1/10 of the calculation result.

・Pre-tightening/Angle

If the pre-tightening torques beyond the measurement start torque, the Angle is the value from the measurement start torque.

If the pre-tightening torque doesn't beyond the measurement start torque, the angle value is 0.1.

Unit is "°".

・Pre-tightening/Time

If the pre-tightening torques beyond the measurement start torque, the time is the value from the measurement start torque.

If the pre-tightening torque beyond the measurement torque, the time is the value from the pre-tightening start.

Unit is "msec".

・Reverse rotation/Torque It displays the torque at the time of the reverse rotation end. Unit is "Nm".

・Final tightening/ Torque It displays the torque at the time of the final tightening end. Unit is "Nm".

・Final tightening/Area(X10) Judgment area in the graph of angle and torque, is the integral value of the torque waveform.

The display value is 1/10 of the calculation result.

・Final tightening/Angle

If the final tightening torque beyond the measurement torque, the angle is the value from the measurement torque.

If the final tightening torque doesn't beyond the measurement torque, the angle value is 0.1.

The measurement torque when the angle method refers to the snug torque, when the torque method refers to the measurement start torque.

Unit is "°".

・Final tightening/Time

If the final tightening torque beyond the measurement torque, the time is the value from the measurement torque.

If the final tightening torque beyond the measurement torque, the time is the value from the final tightening start.

Unit is "msec".

Please see the above about measurement torque

・Final tightening/Snag

It displays the snag torque when final tightening step is Angle method. Unit is "Nm".

・Final tightening/ Initial gradienting Initial gradienting of final tightening. Unit is "%".

・Final tightening/ Final gradienting Final gradienting of final tightening. Unit is "%".

・Final tightening/gradient ratio Gradient ratio of final tightening. Unit is "%".

・X-position It displays the coordinate values of the X-axis at the time of tightening. Unit is "mm".

・Y-position It displays the coordinate values of the Y-axis at the time of tightening. Unit is "mm".

・Zero/magnification /Zero point It displays the zero point value. Unit is "Nm".

・Zero/magnification / magnification It displays the magnification value. Unit is "Nm".

・Work No. It displays the work number.

・Return to the Auto measurement menu　　To return to the Auto measurement menu.

5-2. Tightening wave

You will select “Tightening wave” from “Auto measurement menu”.

Here, it displays the tightening wave. It saves the waveform data and the zero magnification data automatically

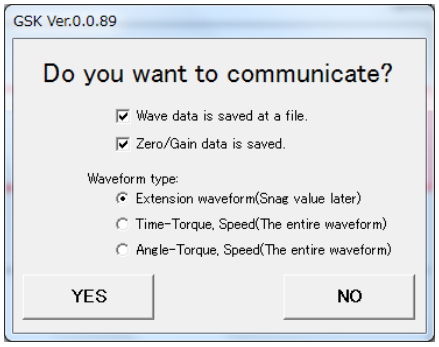


Fig (5-4): Communication confirmation

Do you want to communicate ?

If you select [Yes]:

It will automatically display the tightening waveform and NOBI waveform.

If you select『Wave data is saved at a file』, the wave data will be saved automatically at the file.※

If you select『Zero/Gain data is saved』, the zero/gain data will be saved automatically at the file.※

If you select [No]:

You read the tightening waveform and elongation waveform from the controller manually.

You can save to a file the waveform data read manually.

Also, read the stored waveform data file, you can view the waveform

.※The file of the tightening result is stored in the " C:¥GIKEN¥GSK Setting¥AutoMeasurement¥Wave ".

※Tightening wave has the 2type wave.(Time-Torque and Speed, Angle- Torque and Speed)

If you select [Yes],

You set the OK range for each program that it is displayed by the waveform.

※The specified area in the OK range is surrounded by a red frame in the graph.

If the OK range setting is end, It operates at auto save mode and it communicate with controller.

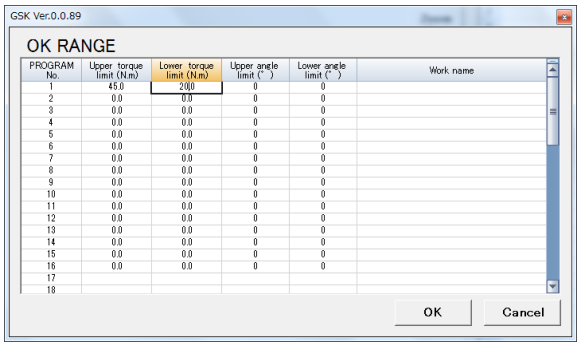


Fig (5-5): OK range setting

・Torque upper limit　It sets the torque upper limit.　・Torque lower limit　It sets the torque lower limit.

・Angle upper limit　It sets the Angle upper limit.　・Angle lower limit　It sets the Angle lower limit.

・Work name　　It sets the work name

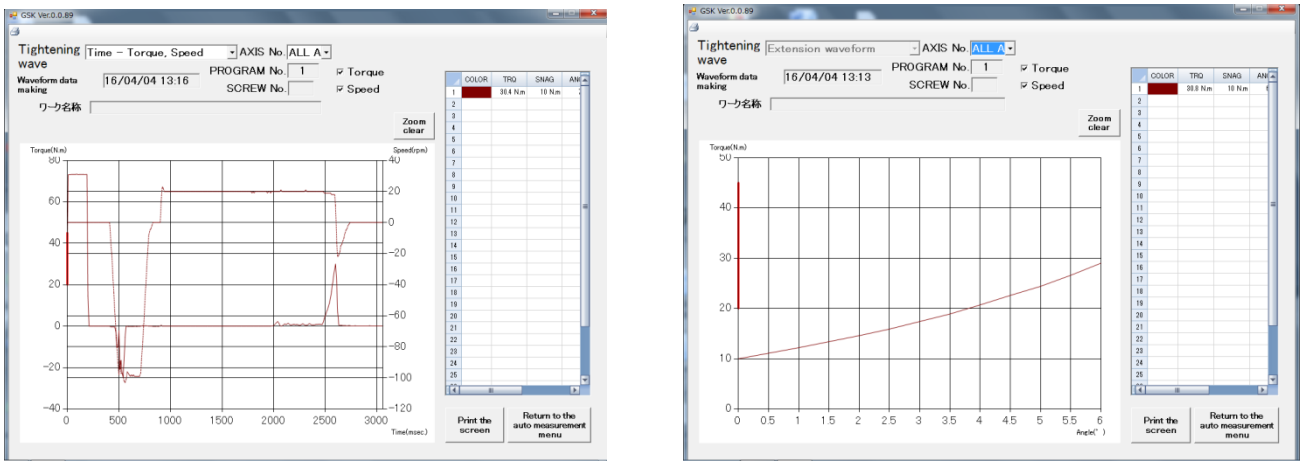


Fig (5-6): Auto saved

If you specify the range of the graph, range will be expanded.

You cannot read and save the data at the time of auto save the tightening wave and NOBI wave

・Wave mode　　You cannot select at the time of auto save the NOBI wave.

・Axis No.

Here, you select the axis number to display the waveform.

If you select『All axes』, graph of all axes is displayed overlapping.

Also, you select the axis number that the graph of axis number is displayed

・Waveform data making　　It displays the date and time that has acquired the tightening waveform.

・PROGRAM NO.　　It displays the program number that has acquired the tightening waveform.

・Screw No.　　It displays the screw number that has acquired the tightening waveform.

・Sampling data list

It is located on the right side of the screen.

It displays the value of the following with respect to the axis number.

Red axis number represents the NG.

・TRQ　　It displays final tightening torque.

・snag　　It displays final tightening snag torque.

・Angle　　It displays final tightening angle same as the online ones.

・Graph　　It displays the graph corresponding to each of the axis (the color of the detailed data).

Speed waveform = dotted line, Torque waveform = solid line.

・Torque and speed check box　　Please put a check to the check box of the waveform that you want to display.

・Zoom clear　　Returns enlarged the waveform graph expansion in front of the graph.

・Print the screen　　Print the screen you are currently viewing.

・・Return to the Auto measurement menu　To return to the Auto measurement menu.

If you select [No],

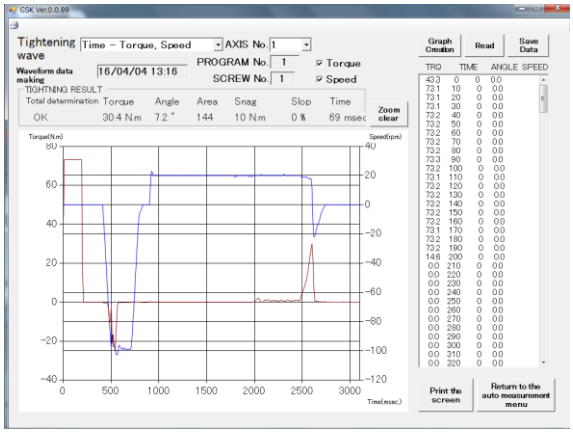


Fig (5-7): Tightening wave screen

※The red line on the graph displays the torque and the Blue graph displays the speed.

If you specify the range of the graph, range will be expanded.

・Wave mode　You select the tightening wave (Time-Angle, Time-Torque, Angle-Torque) that is displayed by the graph.

・Axis No.　You select the axis number to display the waveform.

・Waveform data making　It displays the date and time that has acquired the tightening waveform.

・PROGRAM No.　It displays the program number that has acquired the tightening waveform.

・SCREW No.　It displays the screw number that has acquired the tightening waveform.

・Torque and speed check box　Please put a check to the check box of the waveform that you want to display.

・Tightening result

・Total determination　Total OK: ○, Total NG: NG cord

・Torque　When the last step is final tightening or pre tightening, it displays the value of last torque. Others it displays 0.　Unit is “Nm”.

・Angle　When the last step is final tightening or pre tightening, it displays the value of last angle. Others it displays 0.　Unit is “degree”.

・Area　When the last step is final tightening or pre tightening, it displays the value of area. Others it displays 0.

・Snag　When the last step is angle method of the final tightening, it displays the value of snag torque.
Others it displays 0.

・Slop　When the last step is angle method of the final tightening, it displays the Gradient ratio.
Others it displays 0.

・Time　When the last step is final tightening or pre tightening, it displays the time to the last. Others it displays 0. Unit is “msec”.

・Zoom clear　Returns enlarged the waveform graph expansion in front of the graph.

・Graph creation　You can create the graph with the selected data from the table.

・Save data　It will save the waveform data being displayed in the file.

・Read	It reads the tightening waveform data from the controller. . In addition, it reads the waveform data from a saved CSV file.
・Table (right)	You are viewing the waveform configuration data of the tightening results. The order is in ascending order by time.
・Graph（Center）	It displays the graph of tightening wave
· Print the screen	Print the screen you are currently viewing.
· Return to the Auto measurement menu	To return to the Auto measurement menu.

5-3. Tightening record

You will select “Cycle monitor” from “Auto measurement menu”.

It gets the history tightening from the controller, you can save the history that has been displayed in the file.

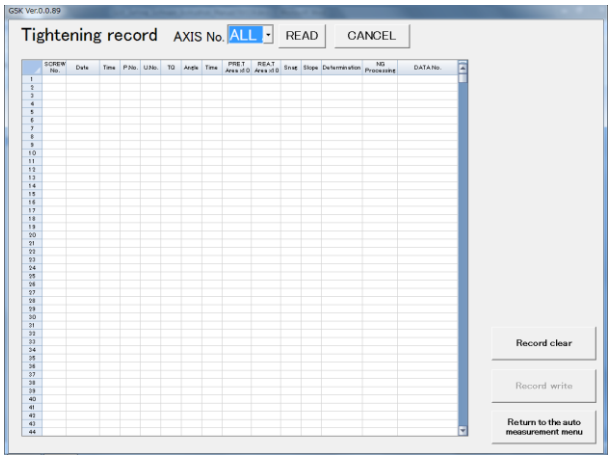


Fig (5-8): Cycle monitor

・Screw No . It displays the screw number.

・Data It displays the date at the time of data acquisition.

・Time It displays the date at the time of data acquisition.

・program No. It displays the program number.

・Unit No. It displays the unit number.

・Torque It displays the final torque. The unit is “Nm”.

・Angle It is the angle from the beginning to the end on the last step. Unit is “degree”.

・Time It is the time from the beginning to the end on the last step. Unit is “msec”.

・pre-tightening area It displays the pre-tightening area. (Display value is 10% of the real value.)

・Final tightening area It displays the final tightening area. (Display value is 10% of the real value.)

・snag It displays the snag torque of the final tightening angle method. The unit is “Nm”.

・slope It displays the gradient ratio of the final tightening angle method.

・Determination OK: ○, NG: NG cord

・NG processing It displays the presence or absence of the NG processing by QL input.
If there is QL processing, it displays “presence ".
Others it displays “absence ".
※It does not save the tightening history when the positioning mode.

・Data No. It displays the work number.

・AXIS No. It will select the axis number to be read.

・READ It will run the read.

・CANCEL It stops reading.

・Record clear It clears the tightening history that is stored in the controller.

・Record write It will save the history that has been displayed in the file. The format is ".CSV"

・Return to the Auto measurement menu　To return to the Auto measurement menu.

5-4. Alarm history

You will select “Alarm history” from “Auto measurement menu”

You get the alarm history information from the controller, you can also save the alarm history that has been displayed in the file.

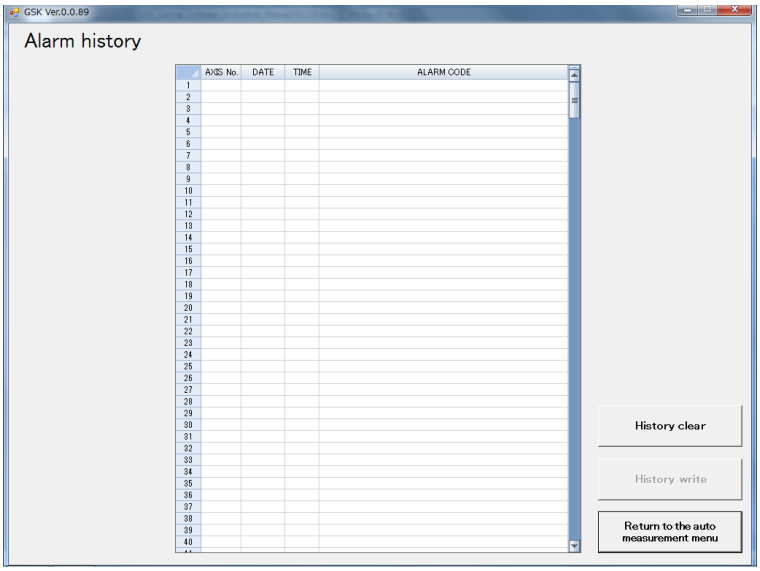


Fig (5-9): Alarm history

・Axis No.　　It displays the axis number that the alarm has occurred.

・Data　　It displays the date that the alarm has occurred.

・Time　　It displays the time that the alarm has occurred.

・Alarm code　　It displays the alarm code of the generated alarm.

・Record clear　　It clears the tightening alarm history that is stored in the controller.

・Record write　　It will save the alarm history that has been displayed in the file. The format is ".CSV"

・Return to the Auto measurement menu　To return to the Auto measurement menu.

5-5. Cycle monitor

You will select “Cycle monitor” from “Auto measurement menu”.

It displays the operating status of the input and output signals between the PLC and the controller.

In addition, you can save the displayed data.

※Please refer to the instruction manual of the controller about content of the signal.

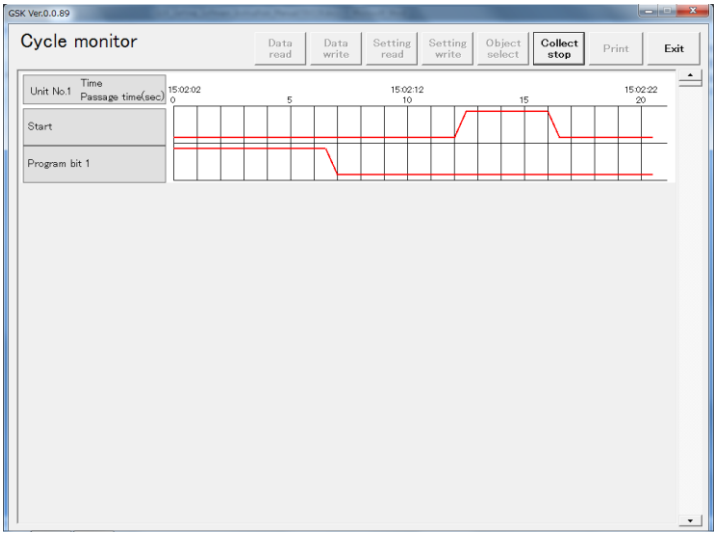


Fig (5-10): Cycle monitor

・Data read　　You can read the signal waveform from a file.

・Data write　　It saves the data displayed in the file.

・Setting read　　You can read the selected signal names from a file.

・Setting write　　It will save the file the signal name in the selection that is displayed.

・Object select　　It will select the signal names you want to take the data.

・Collect start　　It takes the waveform of the signal names that you have selected.

・Print　　It print the screen.

・Return to the Auto measurement menu　To return to the Auto measurement menu.

5-6. Display of current step

You will select “Display of current step” from “Auto measurement menu”.

This function will show which step is running in the selected program.

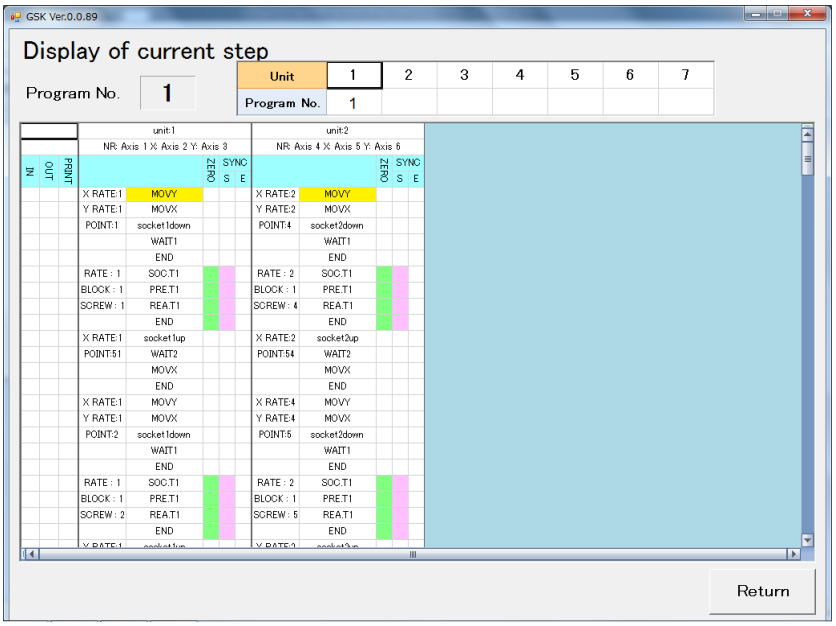


Fig (5-11): Display of current step

・Program No. It displays the program number of currently running.

・Step display The step of running will be displayed in yellow.

・Return to the Auto measurement menu To return to the Auto measurement menu.

6. Quality control

You will select “Quality control” from “Main menu”.

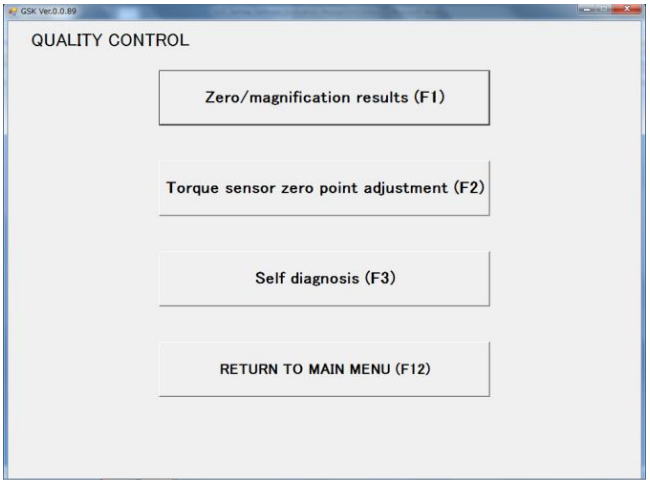


Fig (6-1): Quality control menu

・Zero / magnification results (F1) It displays the results of the zero-point display and the magnification display.

・Torque sensor zero point adjustment(F2) It will adjust the zero point of the torque sensor.

・Self diagnosis (F3) It display version of the personal computer and the IF unit and the controller and the display.
And, the controller version is checked that everything is same.

・Return to the main menu (F12) To return to the main menu.

6-1.Zero / magnification results

You will select “Zero / magnification results” from “Quality control menu”.

Here, we will display the zero point and magnification.

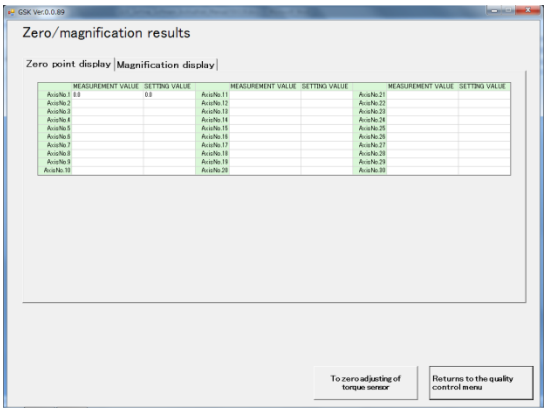


Fig (6-2): Zero point display

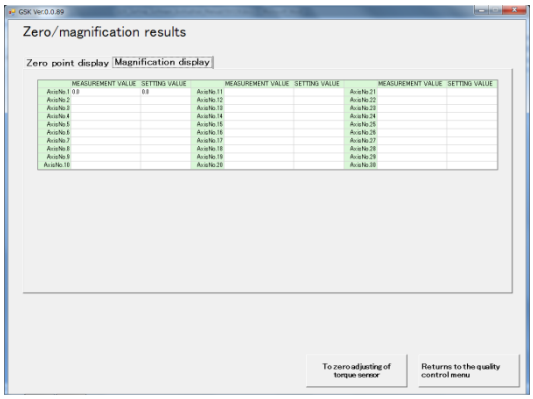


Fig (6-3): Magnification display

・Zero point display　　It displays the set value and zero point measurement value of each axis. The unit is "Nm".

・Magnification display　　It displays the set value and magnification measurement value of each axis. The unit is "Nm".

・To zero adjusting of torque sensor　　It goes to the torque sensor zero point adjustment screen.

・Return to the Quality control menu　　To return to the Quality control menu.

※Zero point / magnification display shows the result after zero/magnification check.

It doesn’t check the zero point and magnification in this screen, so please be careful.

6-2.Torque sensor zero point adjustment

You will select “Torque sensor zero point adjustment” from “Quality control menu”.

You are the output value[Nm] of the torque sensor for each axis has been seen in real time, you can zero correction of the torque sensor.

$$\text{Formula} = \frac{\text{Sensor output value}}{} = \frac{\text{Sensor output value gets from the controller}}{2048} * \text{Sensor rate for each axis}$$

(GSK display value is the data after the zero correction.)

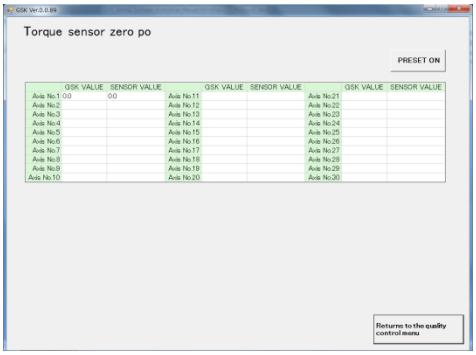


Fig (6-4): Magnification display

・Zero point adjustment ON　　It will run the zero-point correction of the axis number that has been selected on the screen.

・Return to the Quality control menu　　To return to the Quality control menu.

6-3. Self diagnosis

You will select “Self diagnosis” from “Quality control menu”.

It display version of the personal computer and the IF unit and the controller and the display.

And, the controller version is checked that everything is same.

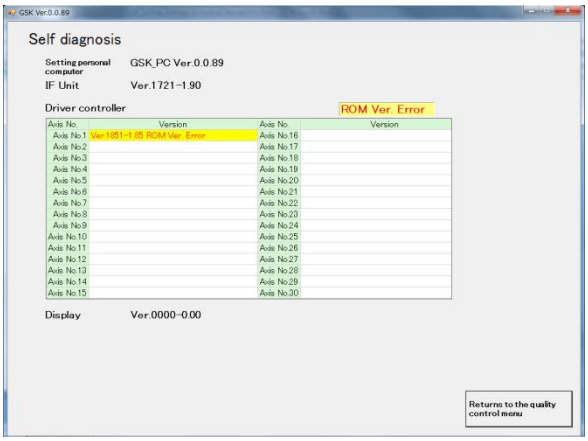


Fig (6-5): Self diagnosis

- ・Setting personal computer — It shows the version of the setting personal computer.
- ・Interface — It shows the version of the Interface.
- ・Driver controller — It shows the version of the driver controller.
- ・Display — It shows the version of the display.
- ・Return to the Quality control menu — To return to the Quality control menu.

7. Print /Excel output

You will select “Print / Excel output” from “Main menu”. Print and Excel output screen is displayed.

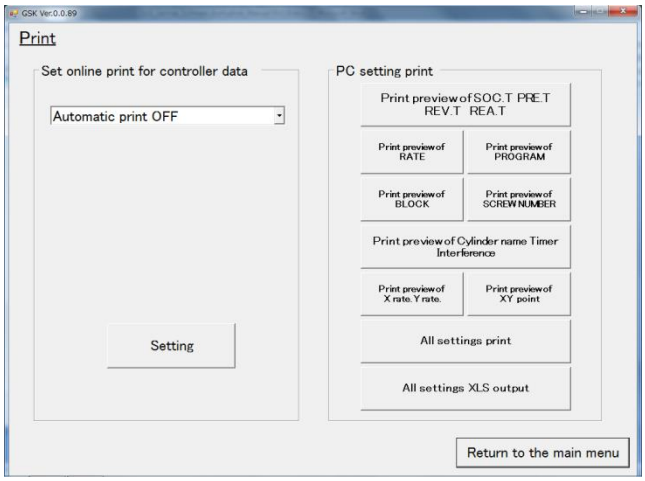


Fig (7-1): Print and Excel output screen

・Set online print for controller data　　It make the print settings to the controller.

・Print mode selection　　It sets the timing of the automatic printing in the print mode selection.

Please select from the following items.

・Automatic print OFF

・At every tightening end

・When NG occurred

・First N set + data when NG occurred

※If you select other than "Automatic print OFF" it will select the result data to be printed in the following.

Please select from the following items

・Socket fitting result print

・Pre tightening result print

・Reverse rotation result print

・Real tightening result print

・Zero magnification result print

※If you select the "First N set + data when NG occurred ", to set the first number.

※If you select " Automatic print OFF", the results print selection, the first number is not displayed.

・PC setting print

・Print preview of SOC.T, PRE.T, REV.T, REA.T

It displays a print preview of setting data SOC.T and PRE.T and REV.T and REA.T in the deployment on the software.

・Print preview of RATE

It displays a print preview of setting rate data in the deployment on the software.

・Print preview of PROGRAM

It displays a print preview of setting program data in the deployment on the software.

・Print preview of BLOCK

It displays a print preview of setting block data in the deployment on the software.

・Print preview of SCREW NUMBER

It displays a print preview of setting screw number data in the deployment on the software.

・Print preview of Cylinder name Timer Interference

It displays a print preview of setting data Cylinder name and Timer and Interference in the deployment on the software.

・Print preview of X rate Y rate

It displays a print preview of setting X rate and Y rate data in the deployment on the software.

・Print preview of X Y point

It displays a print preview of setting X Y point data in the deployment on the software.

・All settings print

It prints the all configuration data that are deployed on software.

・All settings XLS output

All configuration data that are deployed on software is output in XLS format.

・Return to the Main menu

It returns the main menu.

8. I/O Monitor

You will select “I/O monitor” from “Main menu”.

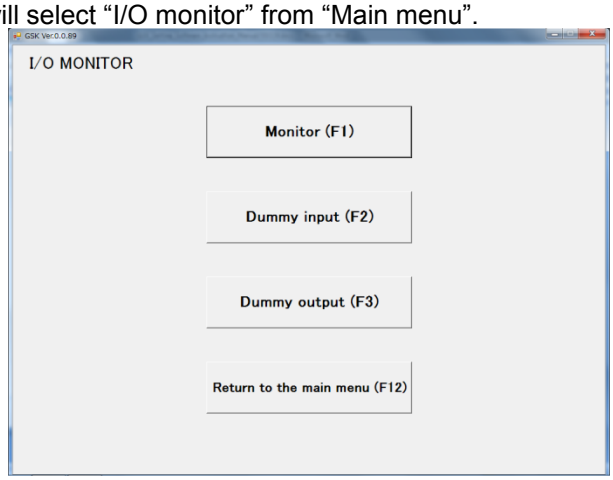


Fig (8-1): I/O monitor menu

・Monitor (F1) The monitor screen is displayed.

・Dummy input (F2) The dummy input screen is displayed.

・Dummy output (F3) The dummy output screen is displayed.

・Return to the main menu (F12) To return to the main menu.

8-1. Monitor

You will select “Monitor” from “I/O monitor menu”.

Here, you can monitor the signal between the controller and PLC.

※It becomes green when the signal is ON, in the case of OFF will be gray.

Please see the instruction manual of the controller when you want to know the content of the signal.

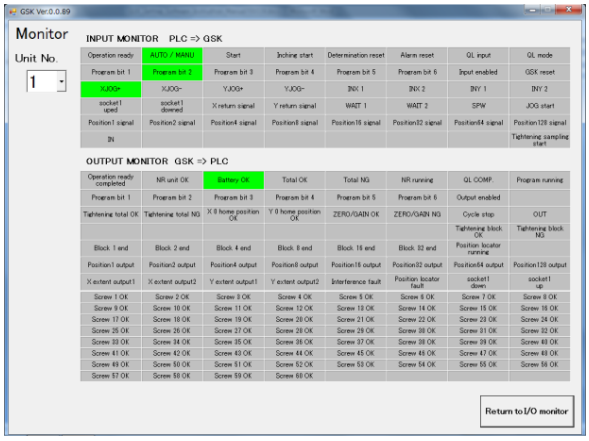


Fig (8-2): I/O monitor

・Unit No. It specifies the unit No. to be monitored.

・Input monitor It will monitor the input signal to the controller.

・Output monitor It will monitor the output signal from the controller.

・Return to I/O monitor To return to the I/O monitor menu.

8-2. Dummy input

You will select “Dummy input” from “I/O monitor menu”.

It will enter the provisions of the selected signal from the configuration PC to the controller.

When you select the input signal changes to green. Please select the input signal, press the Run button.

※Please see the instruction manual of the controller when you want to know the content of the signal.

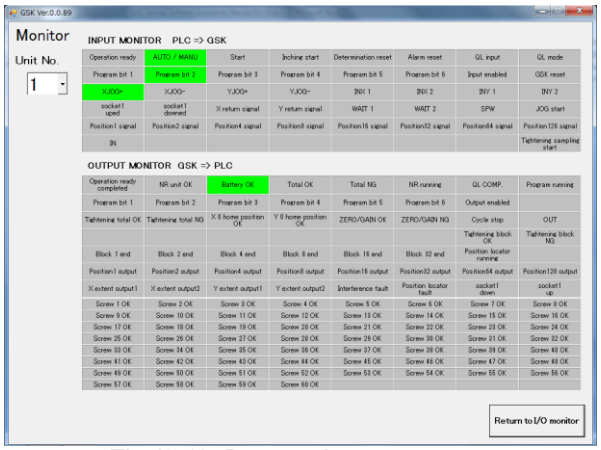


Fig (8-3): Dummy input screen

・Run　　It sends the selected signal to the controller.

It needs the password to run. (Initial Password: 2014)

・Cancel　　It clears the selected signal before transmission.

・Return to I/O monitor　　To return to the I/O monitor menu.

8-3. Dummy output

You will select “Dummy input” from “I/O monitor menu”.

It sends a signal that you specified in the configuration PC from the controller to the PLC.

When you select the input signal changes to green. Please select the input signal, press the Run button.

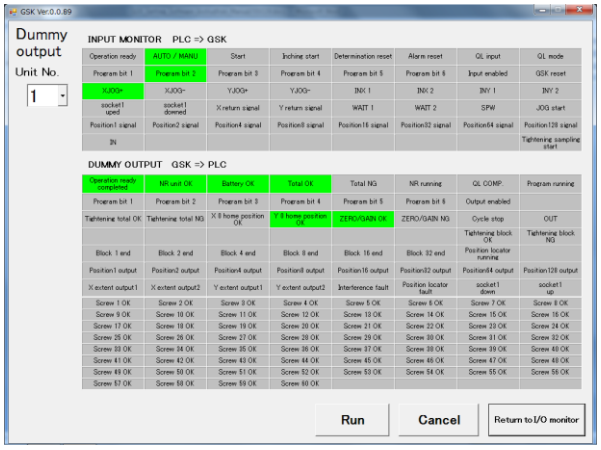


Fig (8-4): Dummy output screen

・Run　　It sends the selected signal to the controller.

It needs the password to run. (Initial Password: 2014)

・Cancel　　It clears the selected signal before transmission.

・Return to I/O monitor　　To return to the I/O monitor menu.

9. Others

9-1. Details of tightening program

The tightening program can be created in the following way.

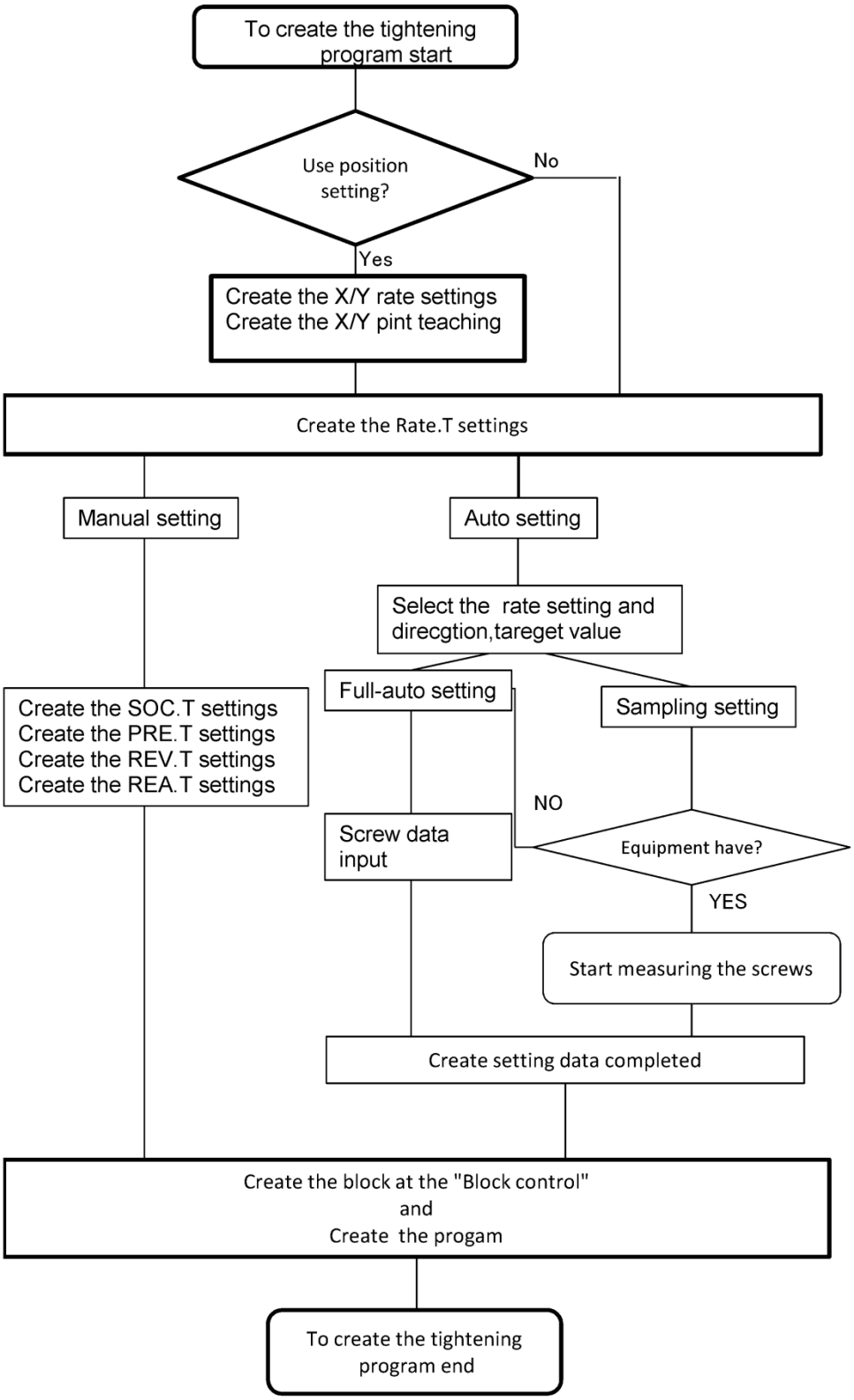


Fig (9-1): About the tightening program how to create

9-2. About Operation preparation OFF of configuration reading

This section describes Operation preparation OFF at the time of reading and writing configuration.

Operation preparation OFF is done in order to ensure the time of the reading and writing of data.

The following table shows how read and write operations on whether the operation preparation OFF is necessary.

○: not need , ×: need

・Reading time

What settings	Decision
The entire setting	○
Nut runner setting (Rate setting, Block control, SOC.T, PRE.T, REV.T, REA.T)	○
Unit setting	○
Tightening data output setting	○
Option setting	○
Screw number setting	○
Program setting	○
Position setting(Cylinder name、X rate、Y rate、Interference)	○
XY Point	○
Timer setting	○
Tightening record	×

・Writing time

What settings	Decision
The entire setting	×
Nut runner setting (Rate setting, Block control, SOC.T, PRE.T, REV.T, REA.T)	×
Unit setting	×
Tightening data output setting	×
Option setting	×
Screw number setting	×
Program setting	×
Position setting(Cylinder name、X rate、Y rate、Interference)	×
Timer setting	×
XY Point	△(Note1)

(Note1) You do not need only each manual operation

The terminology explanation

UNIT

Multiple axes control up to 30 axes can be treated as each axis to independently operate or as a group of several axes (a unit) to operate together. One interface unit can control the maximum 7 units. At least one controller belongs to one unit (maximum 30 axes control to one unit), and one input command is assigned to one unit and then all belonging axes start operation simultaneously. In SIO, different station numbers assigned to each unit.

PROGRAM

Program setting can be established to 30 spindles, 16 programs and 220 steps by default. Before entering program setting by a setting PC, you can program by the program Max value choice screen and change the number of steps. 1 program starts from a control flag (the presences which are a check zero magnification check) and rated setting, and at most 220 steps of movement can be established. (It depends on setting of the program Max value choice screen.)

But, an end is also handled as 1 step. At least more than 1 block has to be set as a program.

BLOCK

Block is a set of operations in tightening program. It's possible to establish each movement by a setting PC and judge the set value of the movement in a block by a corrugated image. The rated screw number and zero magnification check patterns, etc. are added by program setting and a block is inserted.

Starting in the block inserted in program setting starts from rating and indicates settlement to a step of an end. In automatic operation, one-time program start executes one block. It is also possible to start from the block on the way by designating the block number. The determination (Block OK/NG) against the operated block is output on the step in the block end declaration. If “NG“ is determined on either step in the block, it becomes the “block NG” (excluding the case when there is a retry); the next step will not be executed. After determination output, the program start initiates the next block.

STEP

Each operation (socket adjusting, pre-tightening, reverse rotation and final tightening), block end declaration, and retry are called steps respectively. Step 1 will be always the block start declaration and the step 2 will be always the screw number because more than one program is needed in a program. Program is executed from the step 1 and finished by the end declaration at the final block. On the step of the final block end declaration, the total determination (Total OK/NG) is output. Each axis in the unit operates by step synchronization and the axis in which step has been complete turns OFF the servo motor and waits for the step completion of other axes. When steps of all axes are complete, the next step will be operated.

QL INPUT

In the block where the tightening operation is in progress, if the tightening operation is not within the OK range, “NG” determination is output in this block. Operator looks at this “NG” determination and needs to retighten the screw manually. At this time, it is possible to change the determination “NG” to “OK” by inputting the tightening output of the manual torque wrench to the controller. This input is called a QL input.

RETRY

It is possible to retry (try again) operation if NG occurred in set on the step, if NG occurred on the way from the block start declaration till the previous step of retry, the operation following the retry will be executed. If NG did not occur, the operation following the retry will not be executed.

SOCKET ADJUSTING

Used for screw pick up (a socket picks up a screw head) operation before tightening or preventive operation against socket-engagement after tightening.

PRETIGHTENING

Operation to perform temporary tightening until a screw seats

REVERSE ROTATION

It is operation to unfasten the seated screw by several turns in order to transit to final tightening. (Baking inspection of the screw by retightening)

FINAL TIGHTENING

It is final tightening operation of screws.

TIGHTENING OUTPUT SETTING

It's possible to send the calendar setting and the result data engine end no. delivers by interface unit connect to PLC by serial communication. Writing in to an ID controller will be from PLC.

TIGHTENING SUMPLING ACTION

If it revolves and reaches "tightening sampling stop torque" for how to tighten up in one constant speed, the movement I make end is called a tightening sampling action. This is the movement to measure the length of the screw. It's possible to acquire sampling data based on the setting made with this movement and make the set value. It's possible to establish a tightening program simply by this thing. (It's possible to carry out only from a PC.)

SMOOTHING TIGHTENING

While torque reaches "the cut torque" established by final tightening, as the torque rises, the tightening which slows down step by step is performed.

AREA CULCULATING

Integrated value of the torque value every 0.5 degree from this total or at the beginning of the temporary closing movement to the end (the 1Nm unit) is indicated. The indicated value is 1/10 of a calculation result.

END SAME YEAR

When pre-tightening and final tightening end, It rises and finish until it becomes last in the setting torque by 5RPM, and makes sure that each axis will finish finishing at the same time.

NOBI CORRUGATION

It is tightening corrugation from the measurement starting torque (snagged torque).

The revise history

Version	Change contents	notes
The 1st edition	Creation	April.2016
The 2nd edition	Added Z axis setting	November.2017
The 3rd edition	Contact information update	March.2020

GIKEN INDUSTRIAL CO., LTD.

■Headquarters

97-8, Imago-cho Yamatokoriyama, Nara, 639-1031

TEL : +81-743-59-3730

E-Mail（Sales engineering department）：gyomu@gikenkogyo.com

E-Mail（Control engineering section）：seigyo@gikenkogyo.com

■Nagoya Branch Office

1202, Kumada, Nagakute, Aichi, 480-1144

TEL : +81-561-63-5321

E-Mail : nagoya@gikenkogyo.com

■Kanto Branch Office

1-2-15, Matoba, Kawagoe-city, Saitama, 350-1101

TEL : +81-49-298-4755

E-Mail : kanto@gikenkogyo.com

The 3rd edition