GIKEN

March.2020

GKL　Setting Software
Instruction Manual

GIKEN INDUSTRIAL CO., LTD.

Before using it

■Note

①Please read this instruction manual in order to use this product properly.

②We prohibit the use or reproduction of part or all of this instruction manual
　　without permission.

③Please don't do it, thinking that handling and operation not described
　　in this instruction manual cannot be done.
　　In addition, we will exclude defects that occur as a result of handling
　　and operation not described in this instruction manual from the guarantee range.

④The matters described in this manual are subject to change
　　without notice for improvement.

⑤Regarding special products, it may not correspond to this specification.
　　Please consult us separately.

⑥Setting personal computer is optional.
　　Please contact us if necessary.

■Note

　If this product is in a dangerous condition, either turn off the power switch
　　of the main unit and the connected device, or unplug the power cord from the outlet.
　("Dangerous condition" means a state where the occurrence of fire or danger to
　　the body is expected due to abnormal heat generation, smoke emission, ignition, etc.)

Summary

This software is used to configure the GKL / GKLW controller.
The setting input of GKL · GKL controller can be done manually at the front of the controller.
However, since setting input is difficult to understand, we will use this software
 so that it can be easily understood.
When using the setting personal computer, it is easy to enter the setting
 by the batch transmission function, and the maintenance is improved.
In addition, this software allows you to read the tightening history etc.,
 display waveforms such as torque, and monitor the operating condition.

Operating environment

OS : Windows XP (32bit、64bit)
　　　　Windows Vista (32bit、64bit)
　　　　Windows 7 (32bit、64bit)
　　　　Windows 8 (32bit、64bit)

Recommended RAM capacity : Windows XP,Vista : More than 2GB
　　　　　　　　　　　　　　　Windows 7,8 : More than 4GB
　※The above RAM capacity is a standard for comfortable use.

Place of installation :　C¥GIKEN¥GKLSETTING

Starting method :　Please click GKL.exe

Note 1) The initial password for writing to the controller is "2014".

Note 2) Please set the COM port number used for communication with the controller
　　　　in the C ¥ GIKEN ¥ GKL setting ¥ GKL.ini file.

Note 3) Set the version of the controller that communicates with the setting PC
　　　　in the C ¥ GIKEN ¥ GKL setting ¥ GKL.ini file.

Note 4) In order to communicate with the setting personal computer, you need to install
　　　　the USB driver of the controller.

※For details, please refer to "9-1. USB driver installation"
　　and "9-2. About controller and setting personal computer connection".

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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 composition

The screen of the GKL setting software is shown in the figure below.
The configuration itself is not different from GSK.

MAIN MENU				
	Setting read	FILE		
		CONTROLLER		
		SD CARD		
	Setting read	FILE		
		CONTROLLER		
		SD CARD		
	Setting	Common setting	Calender and basic unit setting	Calendar setting
			Screw number setting	Unit setting
		Position setting	Cylinder name setting	Tightening data output setting
			X rate .SET	Option setting
			Y rate .SET	
			XY point setting (Teaching)	
			Timmer setting	
		Nut runner setting	RATE .SET	
			Block control	
			Manual setting (Parametor)	SOC.T SET
				PRE.T SET
				RVE.T SET
				REA.T SET
			Auto setting	
		Program setting		
	Auto measurement		Online	
	Quality control	Zero/magnification result	Tightening wave	
		Torque sensor zero point adjustment	Tightening record	
		Self diagnosis	Alarm history	
	print/ Excel output		Cycle monitor	
	I/O monitor	Monitor	Display of current step	
		Dummy input		
		Dummy output		

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1-2.Main menu initial screen

When the application is started, it automatically gets the data of the GKL controller.
Inquiry "Do you want to communicate?" is coming when the application 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.
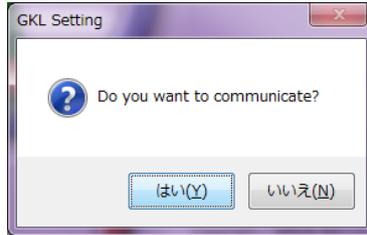
Fig.(1-2): "Do you want to communicate?"

1-3.Communication check, version check function

If you select "Yes" in the above "1-2 Main menu initial screen", automatically GKL controller does communication check, and the version check.
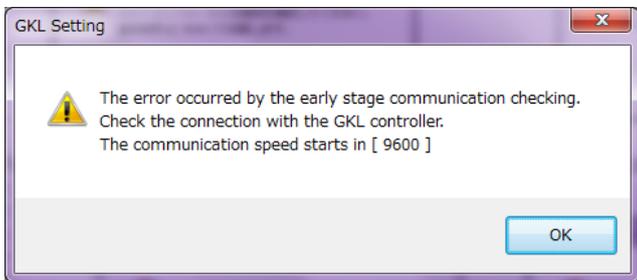
Fig.(1-3): Initial communication check error
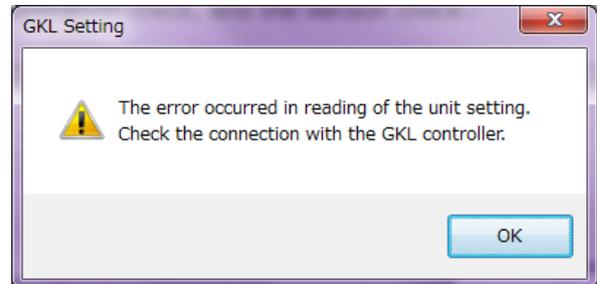
Fig.(1-4): Unit setting acquisition error(※)
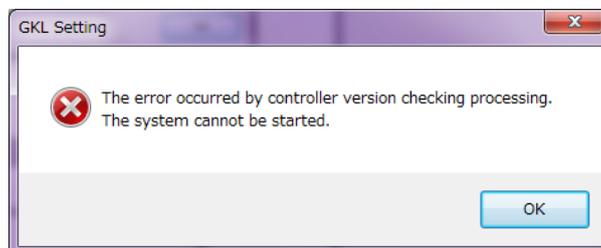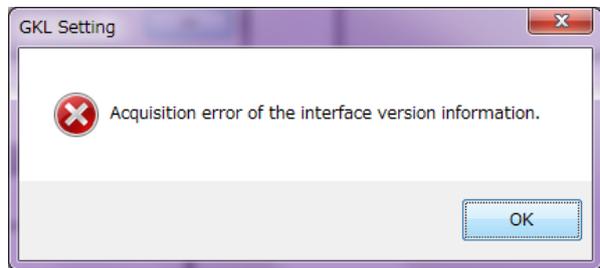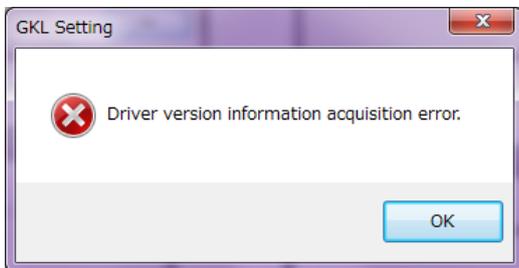
Fig.(1-5): Controller version check error

2.Setting read

Select "Setting read" from the main menu, the following screen will be displayed.
In this item, GKL setting data is read from file, controller, SD card.

GKL Ver.0.0.12

Setting read

FILE (F1)

CONTROLLER (F2)

SD CARD (F3)

RETURN (F12)
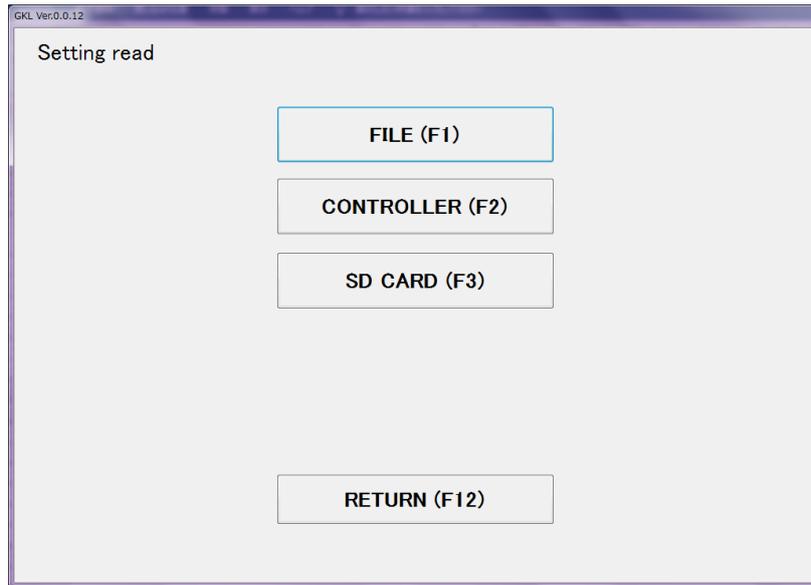
Fig.(2-1): Setting read screen

[Button]
·File(F1)   It reads the GKL configuration file from some folder.

·Controller(F2)   It reads the GKL configuration file from the controller.
                                 If you read the configuration file from the GKL controller,
                                  the controller and computer must be connected by a USB cable.

·SD card(F3)   You can save the settings of GKL controller to the SD card
                                  as a file.
                                 You can read the GKL settings from the SD card
                                  by the configuration PC.

·Return(F12)   Press this button to return to the main menu.

2-1.File

For reading file selection, please select the file with "file extension: GKL". When reading the SD card file, please select file extension: SD "file is read.
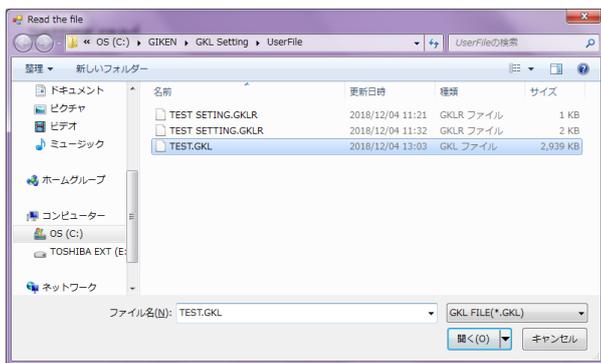
Fig.(2-2): Selection of the read files

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

When you select a file, reading will start. You can see how the GKL setting data is read. The GKL configuration file has the following settings.

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

※GKL configuration file will not be saved the following setting

Tightening output setting   Calendar setting
Option setting   Auto setting

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

When the reading GKL configuration file is complete, the following message is displayed. After the reading, it goes to the "Main menu".
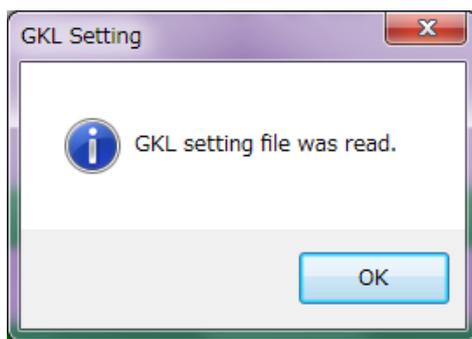
Fig.(2-4): Finish reading configuration file

2-2.Controller

It reads the settings saved in the GKL controller.
When reading the setting from the GKL controller, it is necessary
 that the GKL controller and the personal computer are connected with a USB cable.
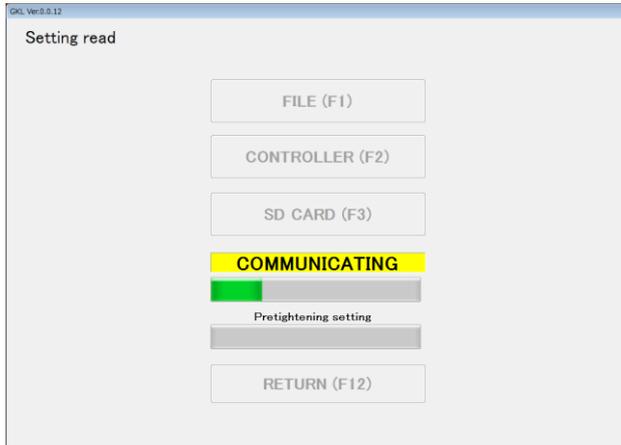
Fig.(2-5): Reading files from the controller
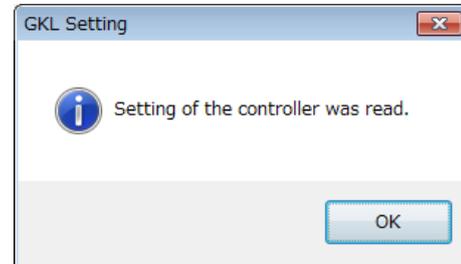
Fig.(2-6): Finish reading configuration file

When the reading from the controller is finished, you will see a message in the Fig (2-6).
After the reading settings from the controller, it goes to the "Main menu".

2-3.SD card

It reads the GKL setting file (extension: SD) saved on the SD card.
※The setting value saved on the SD card using the display function of GKL is
the extension SD.

Since reading in this case reads the file with the extension SD,
there is no need for the SD card to be inserted in the personal computer.
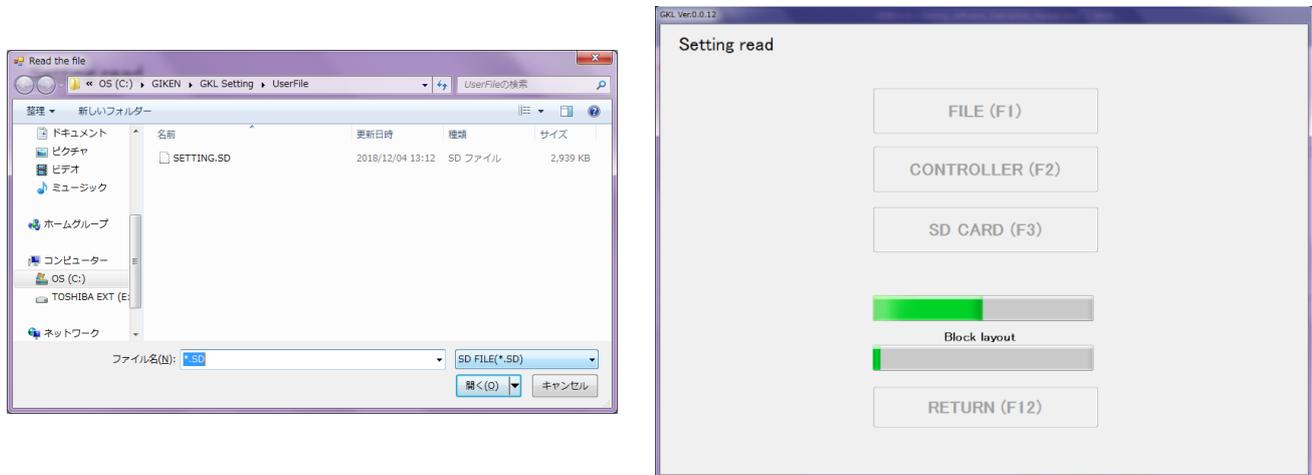
Fig.(2-7): SD data reading
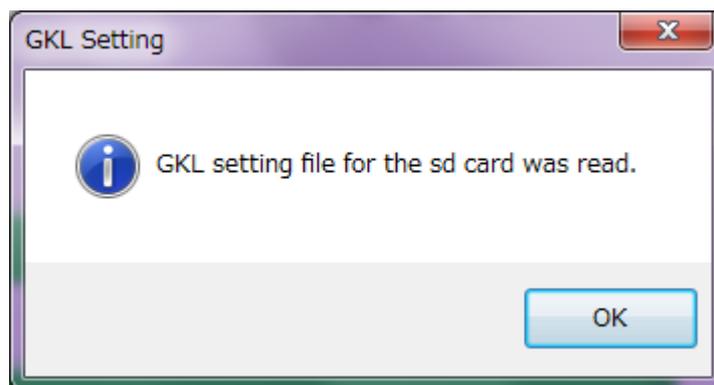
Fig.(2-8):SD data read complete message

When loading of SD data is completed, the message shown in Figure 2-8 is displayed.
After loading of SD data is finished, it will automatically move to "Main Menu".

3.Setting write

Select "Setting write" from "Main Menu", the following screen will be displayed.
In this case, write the setting to "hard disk drive of connected computer",
controller and SD card.
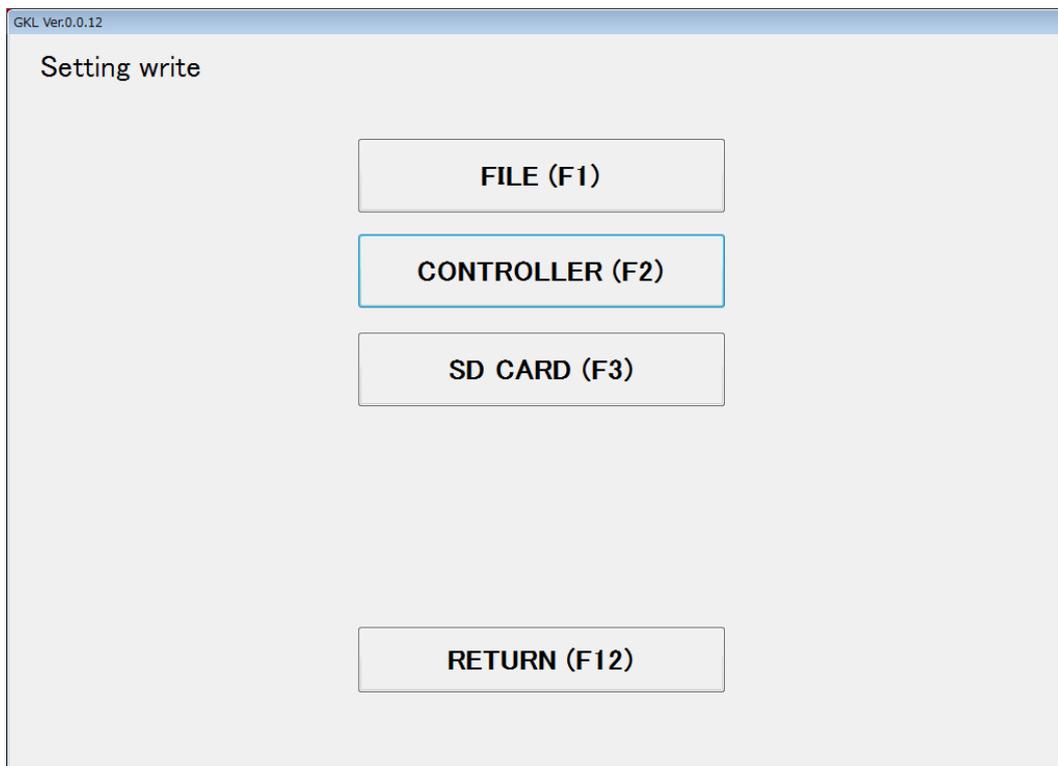
Fig.(3-1):Write Settings Screen

· File (F1)　　　　　　　　　　It will write the GKL setting to the file of the extension GKL.

· Controller (F2)　　　　　　　It will write the GKL setting to the GKL controller.
　　　　　　　　　　　　　　When it writes the setting to the GKL controller,
　　　　　　　　　　　　　　it is necessary that the controller and
　　　　　　　　　　　　　　the personal computer are connected with the USB cable.

·SD card (F3)　　　　　　　　You will write the GKL setting to the extension SD file.

·Return (F12)　　　　　　　　You will return to the main menu.

3-1.File

In the file writing process, it writes the GKL setting information
to the HDD (hard disk drive) of the personal computer or other files
on accessible media.

The GKL setting file with setting information is saved with the file extension: GKL.
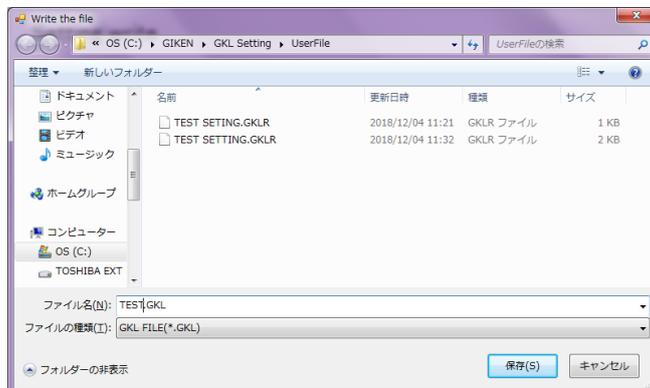
Fig.(3-2). Write dialog

It uses the file selection dialog and writes the GKL setting to the file.

Fig.(3-3). Progress of file writing
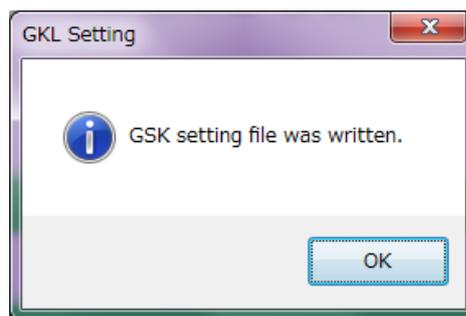
Fig.(3-4). GKL setting file write completion message

When you select a file, writing begins and the progress
of writing the GKL setting file is displayed. (Fig. (3-3))
When the writing of the GKL setting file is completed, the message shown
in Figure (3-4) is displayed.
When you press the OK button, you will automatically go to the main menu screen.

3-2.Controller

Here we write the GKL setting to the controller.
When writing to the controller, it is necessary that the GKL controller
 and the personal computer are connected with a USB cable.
A password is required to write to the controller. (Password: 2014)
If the password is unknown, it can not be written to the controller.
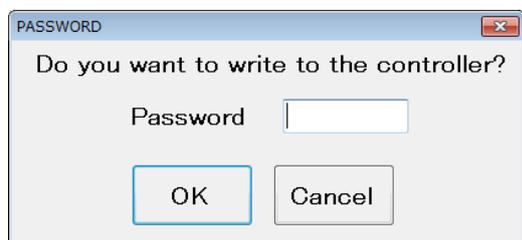
Fig.(3-5): Confirm password   Fig.(3-6): Confirm preparation OFF
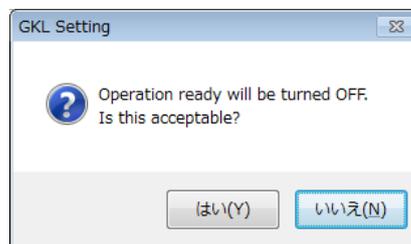
After confirming the password, it will move on to Fig. (3-6) screen.
Please select "Yes" if you can turn off preparation for driving.
Writing can not be done unless driving preparation is turned off.

Fig. (3-7) Progress status of controller writing
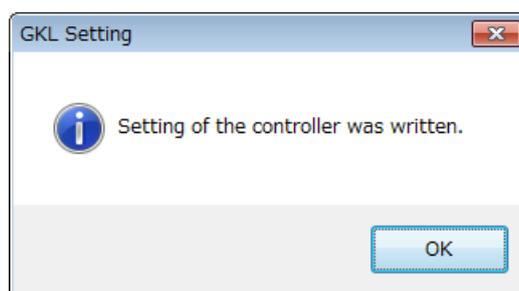
Fig. (3-8): Controller write completion message

When writing to the controller is completed, the message of Fig. (3-8) is displayed.
When you press the OK button in that figure, it automatically moves
 to the main menu screen.

3-3.SD card

In the file writing process, it writes the GKL setting information as a file
with extension: SD that can be read by the GKL controller.
Although this setting file can be written directly to the SD card connected
to the personal computer, it can be saved once in a folder such as "UserFile"
and then transferred to the SD card.
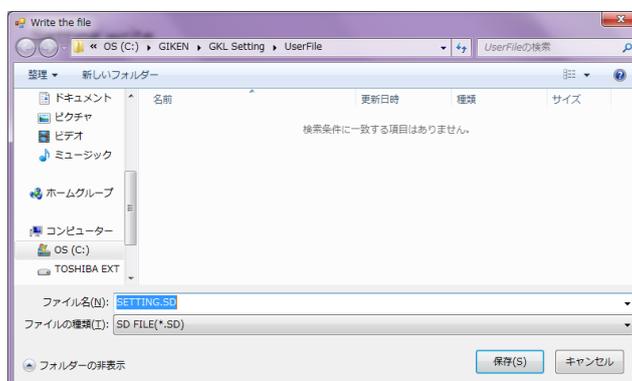
Fig. (3-9): Select write file

You will use the file selection dialog to decide where to write the configuration file
and the name of the file
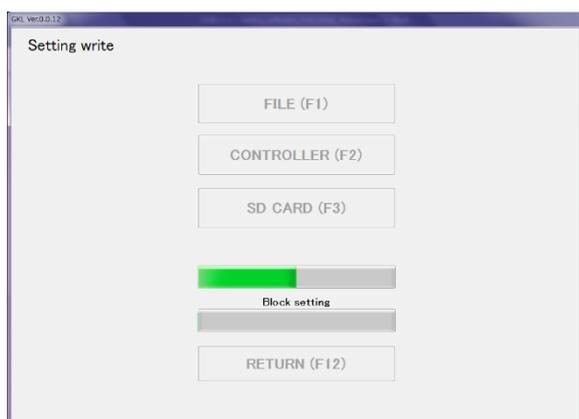
Fig. (3-10): Progress status of file writing
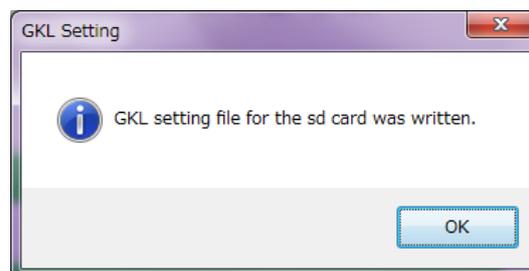
Fig. (3-11): Write file completion message

When you press the "save" button in the dialog, writing starts.
When writing starts, the screen changes to the writing progress of the setting file.
When writing of the setting file is completed, the message
in the upper right figure is displayed, and when you press the "OK" button,
it returns to the main menu.

4.Setting

If "Setting" is selected in the main menu, the screen shown below will be displayed.
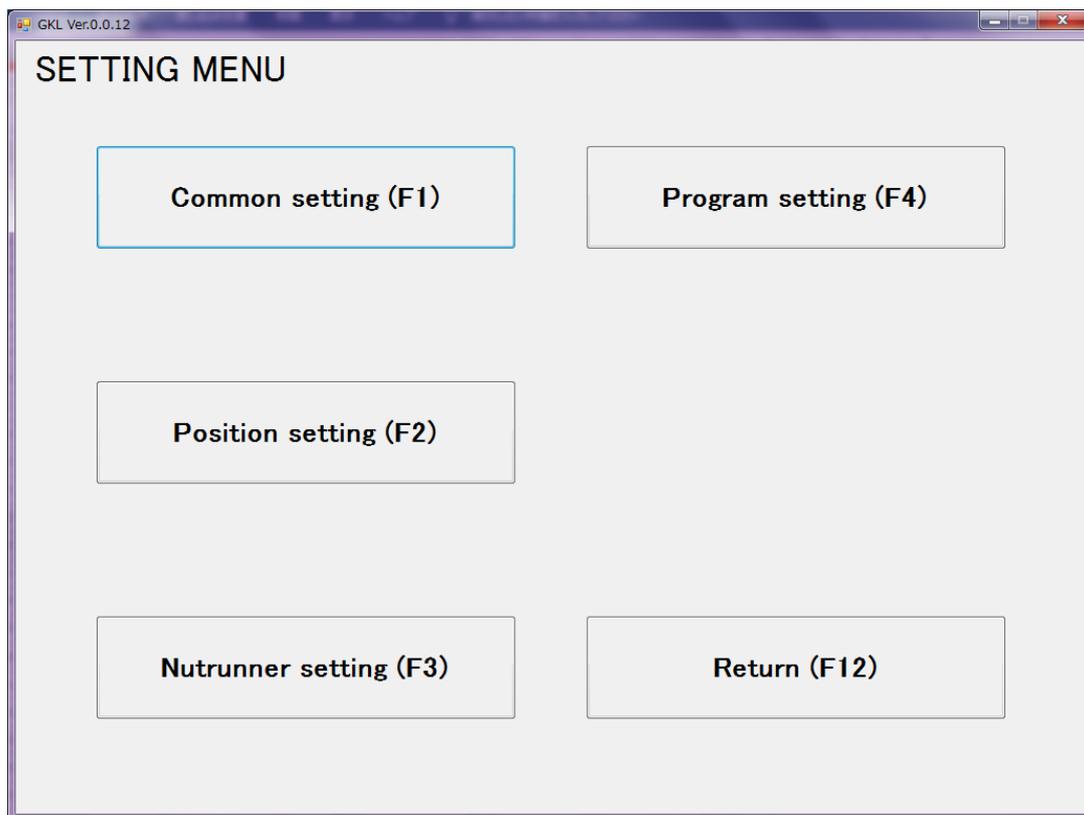
Fig. (4-1):Setting menu

[Button]

　・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

When you select "common setting" in "Setting menu",
the screen shown below will be displayed.
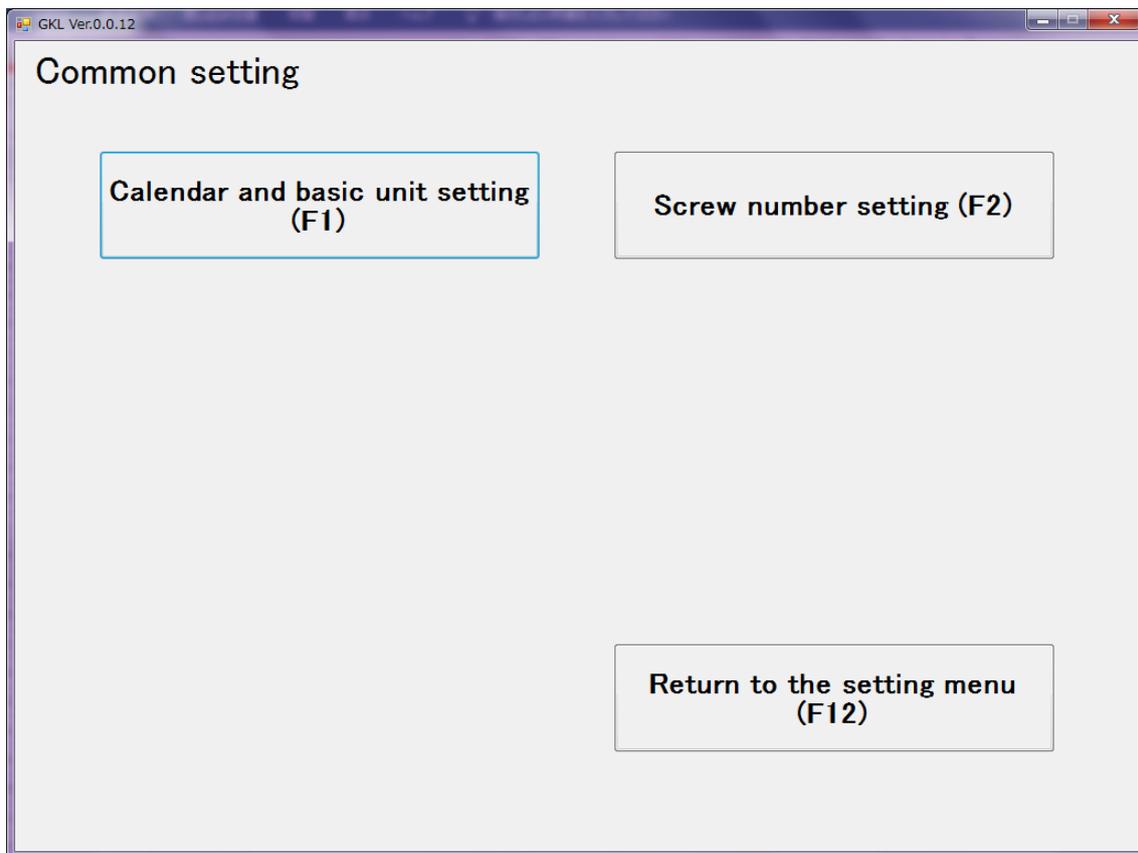
Fig. (4-2):Common setting menu

[Button]
・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)   You can return to the setting menu.

4-1-1.Calendar and basic unit setting

If you select "Calendar / basic unit setting" in "common setting",
the screen shown below will be displayed.
If you press the button, communication starts and you get
the software version displayed in the version information on the upper right.
If it is not connected or communication fails, the version information will be blank
as shown below.
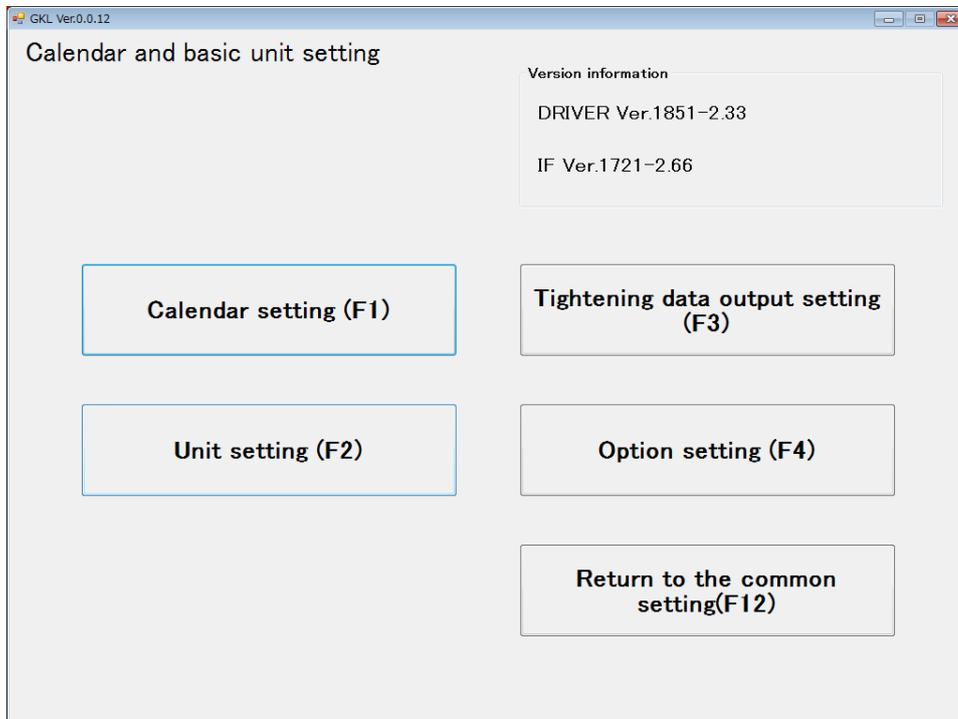
Fig. (4-3): Calendar and basic unit setting

[Button]

・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".

・Return to the common setting (F12)   To return to the "Common setting menu".

[Item]

・Version information   It displays the version of the controller
                                          and interface.

4-1-1-1.Calendar setting

If you select "Calendar Setting" in "Calendar / Basic Unit Setting",
the following screen will appear.
On the screen shown below, you can display the controller's calendar information
and set the PC's calendar information in the controller.
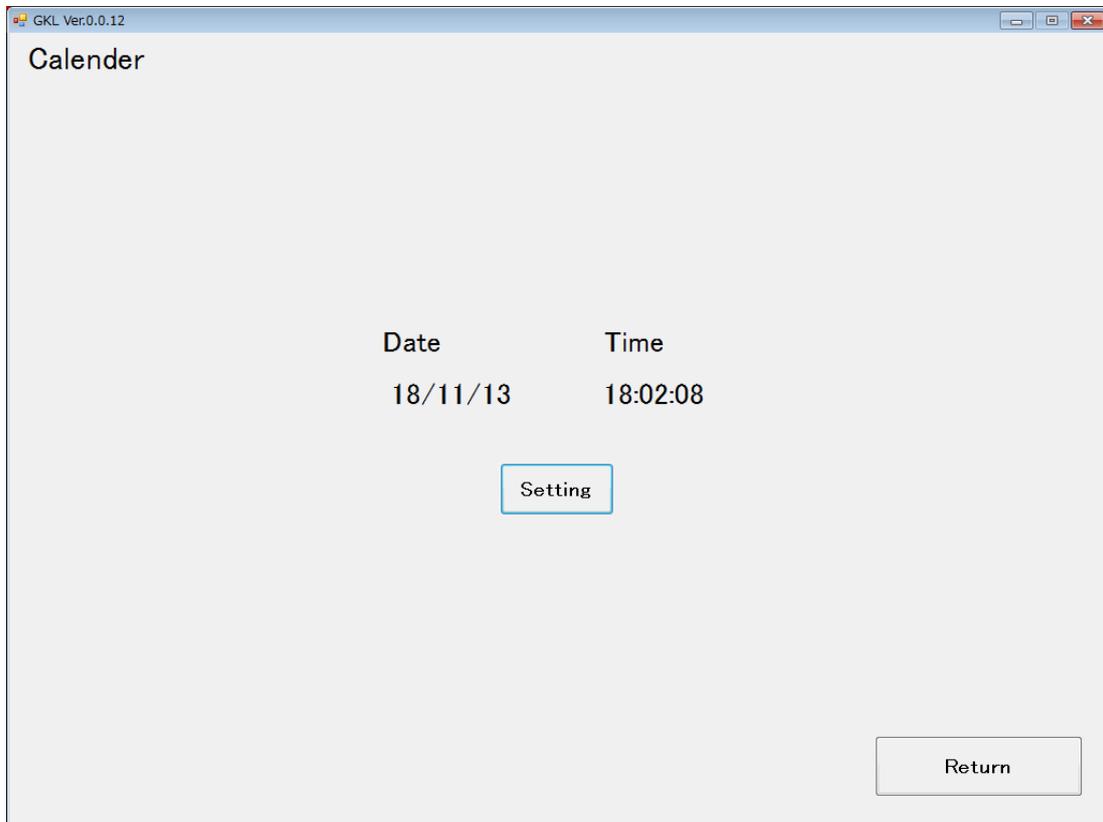
Fig. (4-4): Calendar setting

[Item]
・Date, time   Here we display date and time information
                    the controller currently has.

[Button]
・Setting   It sets the calendar information of the PC to the controller.

・Return   You can return to the "Calendar and basic unit setting".

4-1-1-2.Unit setting

When "Unit Setting" is selected in "Calendar / basic unit setting",
 the screen shown below will be displayed.
Here, you set the role of the unit to which each axis belongs and the motor
 to which the axis moves.
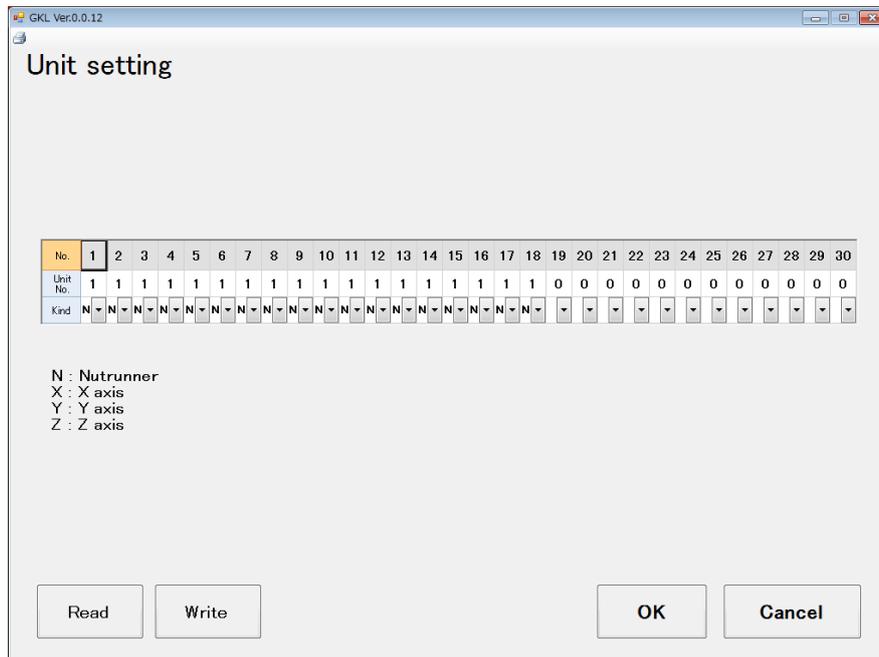
Fig. (4-5): Unit setting

[Item]
・Unit No.	It has to display the affiliation unit of the axis. You can set from 1 to 4 when X, Y or Z is selected in the lower type, and 1 to 7 if it is not.
・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 and basic unit setting menu.
・Cancel	It erases the changes and return to the calendar and basic unit setting menu.

Screen printing: This prints the current screen as it is.

4-1-1-3.Tightening data output setting
　　　This sets the tightening data output from the controller and
　　　　the output contents of Ch10.

Fig. (4-6): Tightening data output setting

　[Item]
　・Axis determination transmission
　　This item determines whether to include judgment for each tightening target
　　　in the output data to the outside.

　・Screw number transmission
　　It sets whether to include the number to be tightened in the output data
　　　to the outside.

　・Engune No. digit setting
　　In this item, you select the number of display digits of the engine No.
　　　from the following numbers.
　　　　0: Do not transmit
　　　　1 to 8: Number of digits

　・Output timing setting
　　Here you select the timing to output tightening data.

　・Transmission digit setting
　　Here you select the number of digits of the output data
　　　such as torque, angle, slope, time etc.

　・Unit number transmission
　　You set whether to transmit the unit number.

　・Program number transmission
　　In this item, you set whether to include program number
　　　in transmission of tightening data.

　・Date and time transmission
　　You choose the description of the date and time of the tightening result to be output.

・Printer / data output switching setting
   You select the CN 10 function of the GKL interface from among the setting items.

   [Button]
   ・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 and basic unit setting menu.

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

   Screen printing: This prints the current screen as it is.

4-1-1-4.Option setting

When "Option setting" is selected in "calendar / basic unit setting menu", the screen shown below will be displayed.
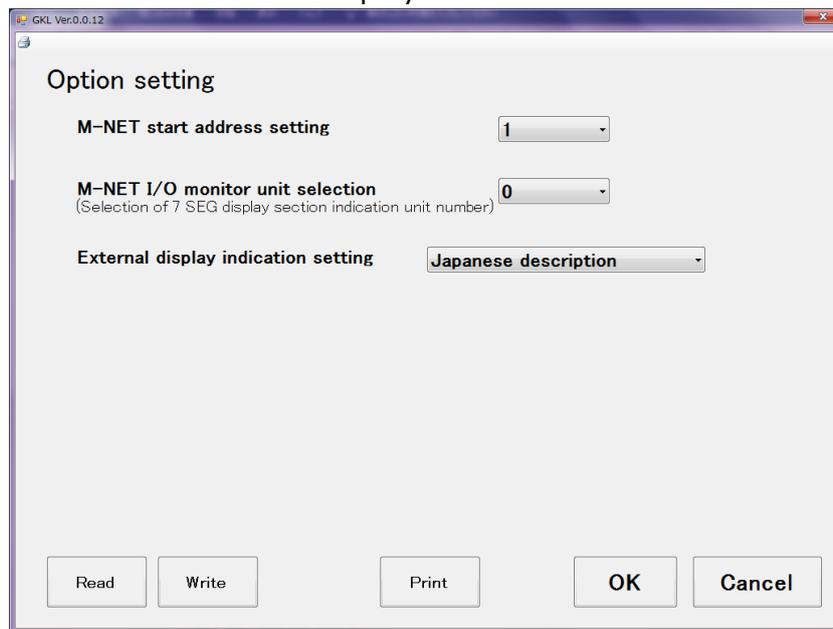
Fig. (4-7): Option setting

[Item]
・M-NET start address setting
　In this item, we will set the address of GKL in M-NET.

・M-NET I/O monitor unit selection
　Here, you select the unit that displays the signal etc. in Fn.3
　　of the 7 SEG monitor on the GKL controller.
　It shows the internal state of the interface when 0 is set, and the status
　　of the input / output signal of that unit number when 1 ~ 7 is set.

・External display indication setting
　It sets the display language of GKL attached monitor.

[Button]
・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 and basic unit setting menu.

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

　🖶　　Screen printing: This prints the current screen as it is.

4-1-2.Screw number setting

When "Screw number array" is selected in "common setting",
the screen shown below will be displayed.
Here we set the axis alignment to be displayed on the external display of GKL.
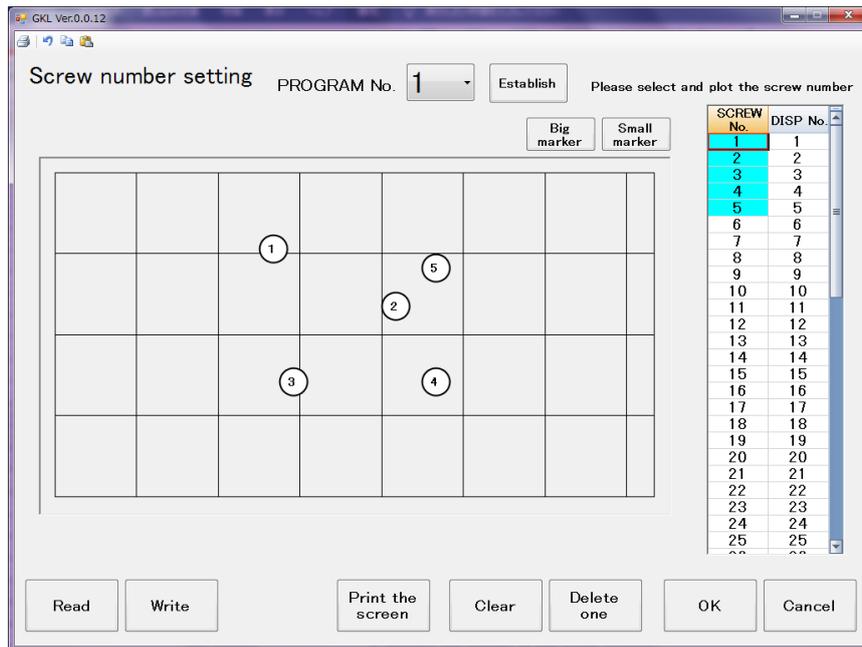
Fig. (4-8): Screw number setting

[Item]
・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.

[Button]

・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.

     Screen printing: This prints the current screen as it is.

     Undo   : Undo changes

     Copy   : Copies the settings for each program number.

     Paste   : Paste the information acquired by copying
                  to the specified program number.

4-2. Position setting

When you select "Positioning setting" from "Setting" menu,
the screen shown below will be displayed.
Here, we will set the positioning used in the XY axis motion selection in "Program setting".
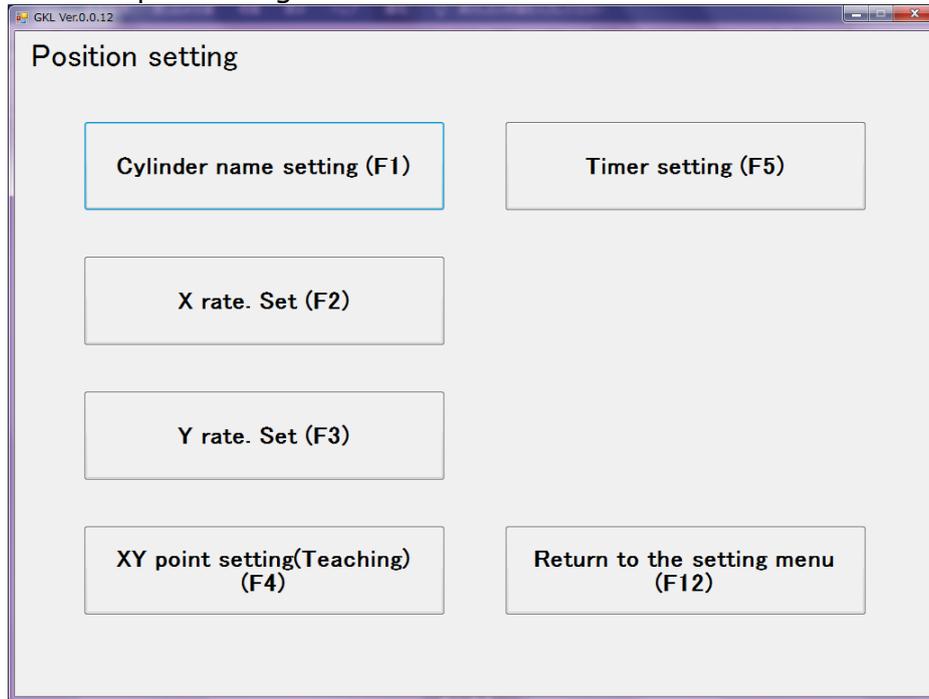
Fig. (4-9): Position setting

[Button]
・Cylinder name setting(F1)   In this item, we set the type and orientation of the cylinder.

・X rate. Set(F2)   In this item, we will set the rating of the motor used
                               for the X axis.

・Y rate. Set(F3)   In this item, we will set the rating of the motor used
                               for the Y axis.

・XY point setting(Teaching)(F4) In this item we will register coordinates
                               to use for positioning.
                               Also, when using the Z axis, we set the rating
                               of the motor to be used for the Z axis within this item.

・Timer setting(F5)   In this item, we will set the maximum waiting time
                               for interference prevention and the time upper limit
                               for positioning operation.

・Return to the setting menu(F12) You can return to the setting menu.

4-2-1. Cylinder name setting

When you select "Cylinder name setting" from "Positioning setting", the screen shown below opens.
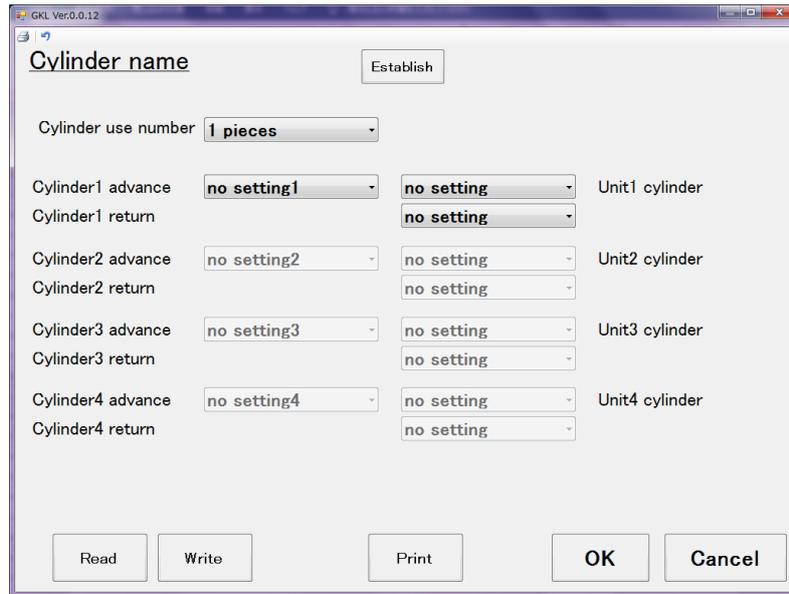
Fig. (4-10): Cylinder name setting

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

One cylinder can be set for each unit.
Even if you set a number that exceeds the number of units to be used, it can not be used in "program setting" which sets the operation.

[Item]
　・Cylinder use number　　You select the number of cylinders to be used.
　　　　　　　　　　　　　　You can set up to 4, the maximum number of units.
　　　　　　　　　　　　　　The number of cylinders selected here can be set below.

　・Cylinder name setting　　In this case, you select the name to be moved
　　　　　　　　　　　　　　 by the target cylinder. (NR, socket etc.)

　　　　　　　　　　　　　　On the right side of the name setting,
　　　　　　　　　　　　　　 you can s elect the movement direction.
　　　　　　　　　　　　　　(Ascending / descending, forward / backward etc.)
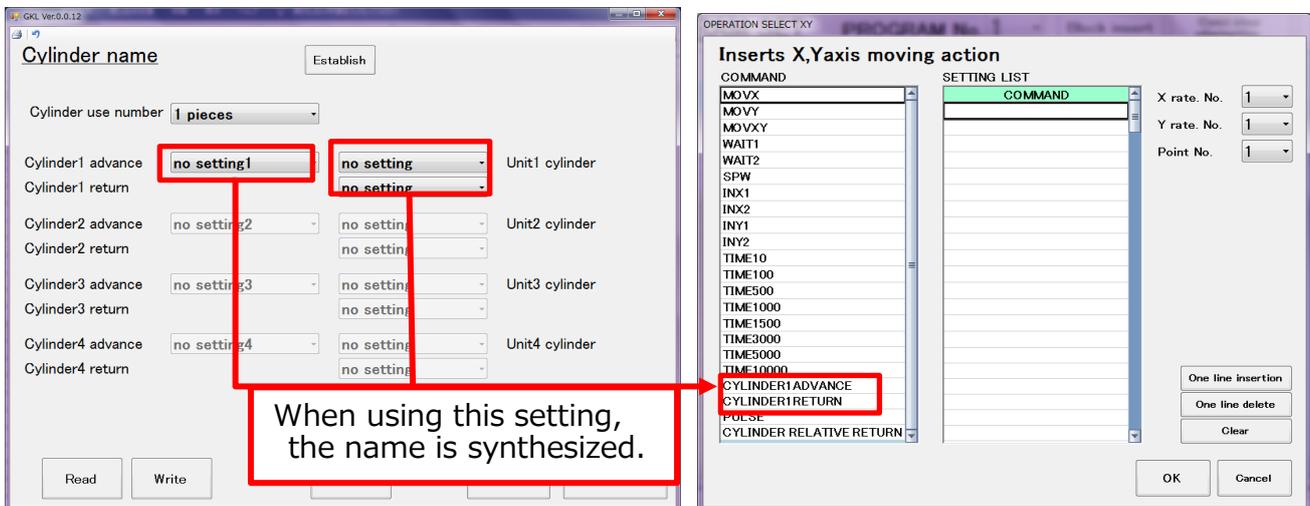
[Button]
  ・Read   It displays the loading screen of Cylinder name setting.

  ・Write   It displays the writing screen of Cylinder name setting.

  ・Print   It runs the printing of Cylinder name setting.

  ・OK   This will return to the positioning setting menu
                    while keeping the change contents.

  ・Cancel   It returns to the positioning setting menu
                   without holding the change contents.
                 Even if you press the confirm button, if you return with this button,
                   the change will be reset.

  Print screen: Print the current screen as it is.

  Undo: Undo changes.

4-2-2.X rate.set

When you select "X axis rating" from "Position setting",
 the following screen will be displayed.
Here we set the rating of the X axis positioning motor.

Fig. (4-11): X rate. screen

[Item]
・Setting No.   In this item, we will select the X rated number to be set.

・Acceleration(Input range: 0 to 32767)
   Here we set the acceleration constant at which the positioning motor reaches
    the moving speed from the start of operation.

・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.

・Point coordinate(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)
   It sets the lower limit value of the area that outputs the X range output 1
    of the output signal.
・Extent output 1 up limit(Input range: 0 to 3276.7)
   It sets the upper limit value of the area that outputs the X range output 1.
   If the current position of the X coordinate is between the lower limit and the upper limit
    of the range output, the output signal "X range output 1" turns ON.

・Extent output 2 down limit(Input range: 0 to 3276.7)
   It sets the lower limit value of the area that outputs the X range output 2
    of the output signal.

・Extent output 2 up limit(Input range: 0 to 3276.7)
   It sets the upper limit value of the area that outputs the X range output 2.
   If the current position of the X coordinate is between the lower limit and the upper limit
    of the range output, the output signal "X range output 2" turns ON.

・Motor 1 rotate move(Input range: 0 to 32.767)
　Sets the pitch of the ball screw used for positioning.
　This setting determines the maximum moving speed.

・Moter model　　　　　　　　　Here we select the type of motor to use.

・Rotate direction　　　　　　　Here we set the direction of the motor to be
　　　　　　　　　　　　　　　　in the + direction from the original position.
[Button]
・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

・O K　　　　　　　　　　　　It retains the changes and returns
　　　　　　　　　　　　　　　to the positioning setting menu.

・Cancel　　　　　　　　　　　It returns to the positioning setting menu
　　　　　　　　　　　　　　　without holding the change contents.

 Print screen: Print the current screen as it is.

 Undo: Undo changes.

 Copy: It copies the setting contents for each setting number.

 Paste: It pastes the information acquired by copying
　　　　　　　　to the specified setting number.

4-2-3.Y rate.set

When you select "Y axis rating" from "Position setting",
the following screen will be displayed.
Here we set the rating of the Y axis positioning motor.

Fig. (4-12): Y rate. screen

[Item]
・Setting No.   In this item, we will select the Y rated number to be set.

・Acceleration(Input range: 0 to 32767)
  Here we set the acceleration constant at which the positioning motor reaches
   the moving speed from the start of operation.

・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.

・Point coordinate(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)
  It sets the lower limit value of the area that outputs the Y range output 1
   of the output signal.
・Extent output 1 up limit(Input range: 0 to 3276.7)
  It sets the upper limit value of the area that outputs the Y range output 1.
  If the current position of the Y coordinate is between the lower limit and the upper limit
   of the range output, the output signal "Y range output 1" turns ON.

・Extent output 2 down limit(Input range: 0 to 3276.7)
  It sets the lower limit value of the area that outputs the Y range output 2
   of the output signal.

・Extent output 2 up limit(Input range: 0 to 3276.7)
  It sets the upper limit value of the area that outputs the Y range output 2.
  If the current position of the Y coordinate is between the lower limit and the upper limit
   of the range output, the output signal "Y range output 2" turns ON.

・Motor 1 rotate move(Input range: 0 to 32.767)
　Sets the pitch of the ball screw used for positioning.
　This setting determines the maximum moving speed.

・Moter model　　　　　　　　Here we select the type of motor to use.

・Rotate direction　　　　　　Here we set the direction of the motor to be
　　　　　　　　　　　　　　　in the + direction from the original position.

[Button]
・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

・O K　　　　　　　　　　　　It retains the changes and returns
　　　　　　　　　　　　　　to the positioning setting menu.

・Cancel　　　　　　　　　　It returns to the positioning setting menu
　　　　　　　　　　　　　　without holding the change contents.

　Print screen: Print the current screen as it is.

　Undo: Undo changes.

　Copy: It copies the setting contents for each setting number.

　Paste: It pastes the information acquired by copying
　　　　　to the specified setting number.

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

This item opens when you select "XY point teaching" from "Position setting menu".
Here we set the coordinate of the tightening point and Z axis rating.
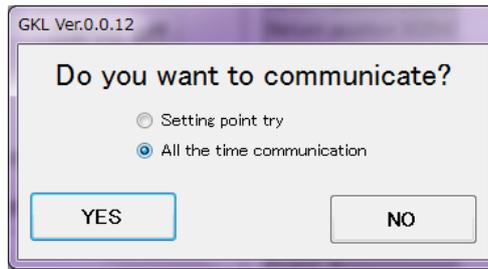
Fig.(4-13):Communication confirmation

When "XY point teaching" is selected, communication confirmation is done on the screen
  of the above figure.
If you do not communicate, please select "No" as it is.
When communicating, please select either "Acquire setting point only"
  or "Always perform communication" and select "Yes".

「Setting point try」
When entering the XY point teaching screen, you acquire the set coordinates and enter.
The current coordinates are not read.

「All the time communication」
It acquires the set coordinates when entering the XY point teach screen
  and updates the current coordinates in real time with real time.
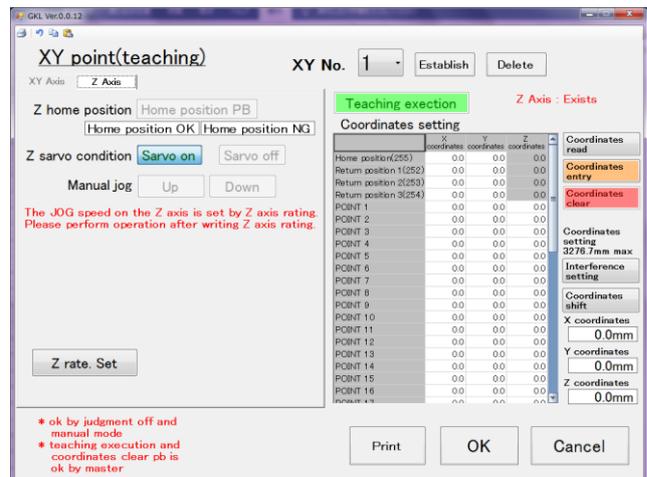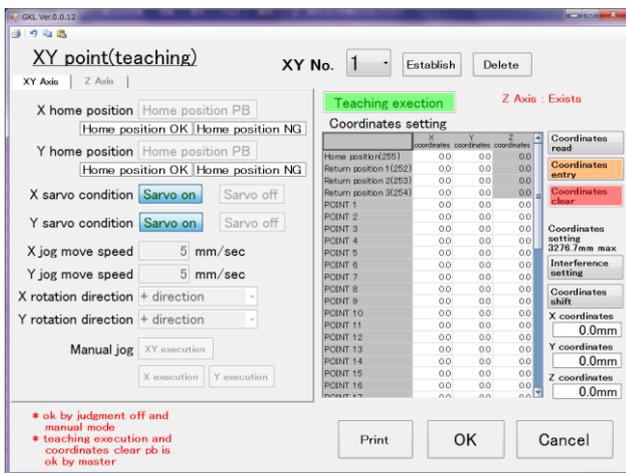
Fig.(4-14):Teaching screen

[Item]
・ＸＹＮｏ.   Here we select the unit number that uses
                              the selected coordinate system.

〈ＸＹ axies〉
・X home position   When the X axis of the target unit is the origin,
                               "Home position OK" is lit, otherwise
                                it will light "Home position NG".
                              Neither will shine when not communicating.

・Y home position   When the X axis of the target unit is the origin,
                               "Home position OK" is lit, otherwise
                                it will light "Home position NG".
                              Neither will shine when not communicating.

| ・X sarvo condition | This item indicates whether drive power is supplied to the X axis motor. "Servo ON" lights up when power is supplied to the X axis motor, and "Servo OFF" lights when power is not supplied. "Servo ON" lights up when not communicating. |

・X sarvo condition   This item indicates whether drive power is supplied to the X axis motor.
"Servo ON" lights up when power is supplied to the X axis motor, and "Servo OFF" lights when power is not supplied.
"Servo ON" lights up when not communicating.

・Y sarvo condition   This item indicates whether drive power is supplied to the Y axis motor.
"Servo ON" lights up when power is supplied to the Y axis motor, and "Servo OFF" lights when power is not supplied.
"Servo ON" lights up when not communicating.

JOG move speed
  ・X axis   In this item, set the movement speed of X axis coordinate during JOG operation.
The unit is [mm / sec].

  ・Y axis   In this item, set the movement speed of Y axis coordinate during JOG operation.
The unit is [mm / sec].

・X rotation direction   When the manual JOG operation is started and the destination coordinate number is not specified, the X axis moves at the jog moving speed in the direction specified here.

・Y rotation direction   When the manual JOG operation is started and the destination coordinate number is not specified, the Y axis moves at the jog moving speed in the direction specified here.

・Manual JOG   The JOG operation is started with the following three kinds of buttons here.
The JOG operation is performed only while this button is held down.

  ・X Y execution   The X axis and the Y axis simultaneously perform JOG operation.

  ・X execution   JOG operation is performed only on the X axis.

  ・Y execution   JOG operation is performed only on the Y axis.

〈Z axis〉
※This screen is not displayed unless you have the Z axis motor in the unit setting.

・Z home position   When the Z axis of the target unit is the origin,
                                       "Home position OK" is lit, otherwise
                                        it will light "Home position NG".
                                      Neither will shine when not communicating.

・Z sarvo condition   This item indicates whether drive power is supplied
                                       to the Z axis motor.
                                      "Servo ON" lights up when power is supplied
                                       to the Z axis motor, and "Servo OFF" lights
                                       when power is not supplied.
                                      "Servo ON" lights up when not communicating.

・Mnual JOG   JOG operation is started with the button here.
                                      For the Z axis, set the jog moving speed
                                       with "Z rate. Set".
                                      You can also use the "Up" and "Down" buttons
                                       to perform the direction and the execution
                                       on the "XY axis".

・Z rate. Set   Here we set the rating of the Z axis positioning.

〈Teaching〉
・Teaching exection   It sets the current coordinates to the coordinate's cell
                                       of the specified point in the table.
                                      And furthermore, it writes registered coordinate data
                                       to the controller by this function.

・Coordinates setting   The points from 1 to 160 and the coordinates list
                                       of the origin position and relay point are displayed.
                                      Please click on the leftmost column
                                       to specify the point.
                                      If the point number column turns yellow, it is
                                       in selected state.

・Coordinates read   It reads the coordinate values that are currently
                                       registered from the controller
                                      If reading fails, all the values set here are initialized,
                                       including interference area setting.
                                      However, since initialization is only
                                       on the setting software,
                                       initialized values are not written to the controller.

・Coordinates entry   It registers the coordinate values that are displayed
                                       on the screen to the controller.
                                      You can change the coordinate value
                                       by entering it directly into the cell
                                       and pressing this button.

・Coordinates clear   This sets the coordinate value of the specified point
                                       to 0。
                                       (Since we send a write command to the controller,
                                        it is not necessary to register the coordinates
                                        after clearing the coordinates again.)

・Interference setting

Pressing this button moves the screen
to the interference area setting screen.
In the interference area setting,
you can specify whether you can specify the area
that can be manually entered,
set the adjacent interference area, and enable it.
In order to enter this screen, it is necessary
to enter a password.

・Coordinates shift

All the coordinates set in the coordinate setting table
are shifted on the screen below.
※When the coordinate value is 0, it is not shifted.
(ex.) :When (20, 0) is shifted by (30, 40), it becomes (50, 0).
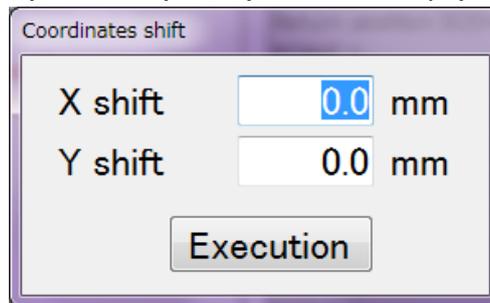
Fig.(4-15):Coordinates shift screen

・X coordinate

This column displays the current coordinate value
of the X axis.

・Y coordinate

This column displays the current coordinate value
of the Y axis.

・Z coordinate

This column displays the current coordinate value
of the Z axis.

Print screen: Print the current screen as it is.

Undo: Undo changes.

Copy: It copies the setting contents for each setting number.

Paste: It pastes the information acquired by copying
to the specified setting number.

4-2-4-1.Z rate. set
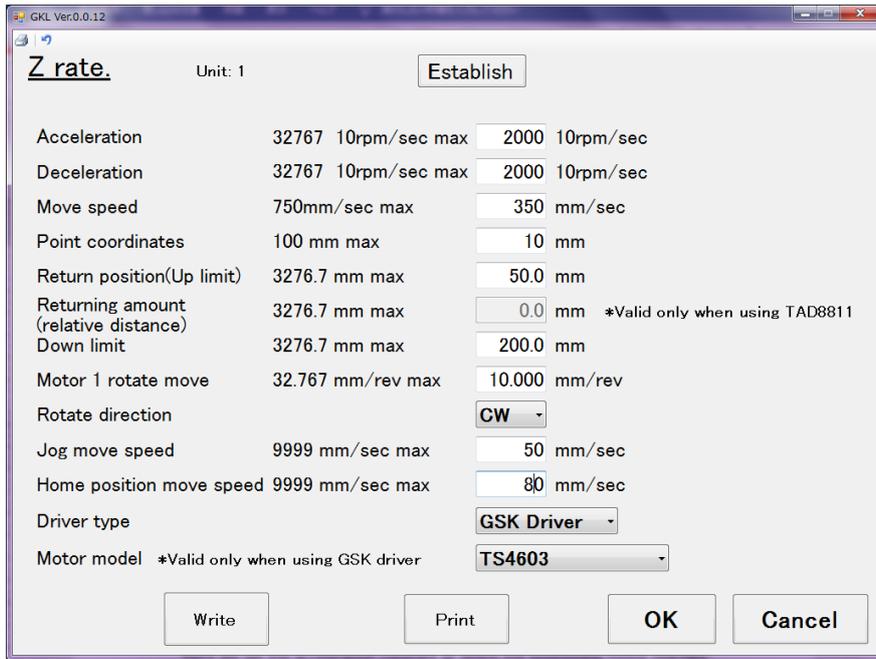
Fig.(4-16):Z rate setting screen

[Item]
・Acceleration(Input range: 0 to 32767)
　　Here we set the acceleration constant at which the positioning motor reaches
　　　the moving speed from the start of operation.

・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.

・Point coordinate(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 (Up limit)
　　This setting is the maximum value on the rising side of the Z axis.
　　In this item, the position where the axis hits in the upward direction is assumed
　　　to be 0.
　　And it sets how many millimeters down from that state.

・Returning amount(relative distance)
　　This setting is the amount of return when "Cylinder relative return" command is input
　　　in program setting.
　　※It can be used only when TAD 8811 is selected for driver type.

・Down limit　　　　　　　　　This sets the maximum descent position of the Z axis.
　　　　　　　　　　　　　　　In this item, the position where the axis hits
　　　　　　　　　　　　　　　　in the upward direction is assumedto be 0.
　　　　　　　　　　　　　　　And it sets how many millimeters down from that state.
　　　　　　　　　　　　　　　This setting also shows the "soft limit" on the Z axis.

・Motor 1 rotate move(Input range: 0 to 32.767)
　　Sets the pitch of the ball screw used for positioning.
　　This setting determines the maximum moving speed.

・Rotate direction　　　　　　　Here we set the direction of the motor to be
　　　　　　　　　　　　　　　　in the + direction from the original position.

・JOG move speed　　　　　　　This sets the moving speed during JOG operation.

・Home return moving speed　　When the return command is input,
　　　　　　　　　　　　　　　the return operation is started.
　　　　　　　　　　　　　　　This sets the movement speed at that time.

・Driver type
　　This setting selects the controller that controls the Z axis positioning motor
　　 from GKL and TAD8811.
　　※Normally "GKL driver" is set.

・Moter model　　　　　　　　Here we select the type of motor to use.

[Button]
・Establish　　　　　　　　　It establish the change contents.

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

・Print　　　　　　　　　　　It runs the printing of Z rate. Set

・O K　　　　　　　　　　　　It retains the changes and returns
　　　　　　　　　　　　　　 to the XY point setting screen.

・Cancel　　　　　　　　　　It returns to the XY point setting screen
　　　　　　　　　　　　　　 without holding the change contents.

　　　Print screen: Print the current screen as it is.

　　　Undo: Undo changes.

4-2-4-2.Interference setting

      When you select "Interference area setting" from "XY point teach",
      the following screen will be displayed.
      Here we set the interference area of the XY unit.
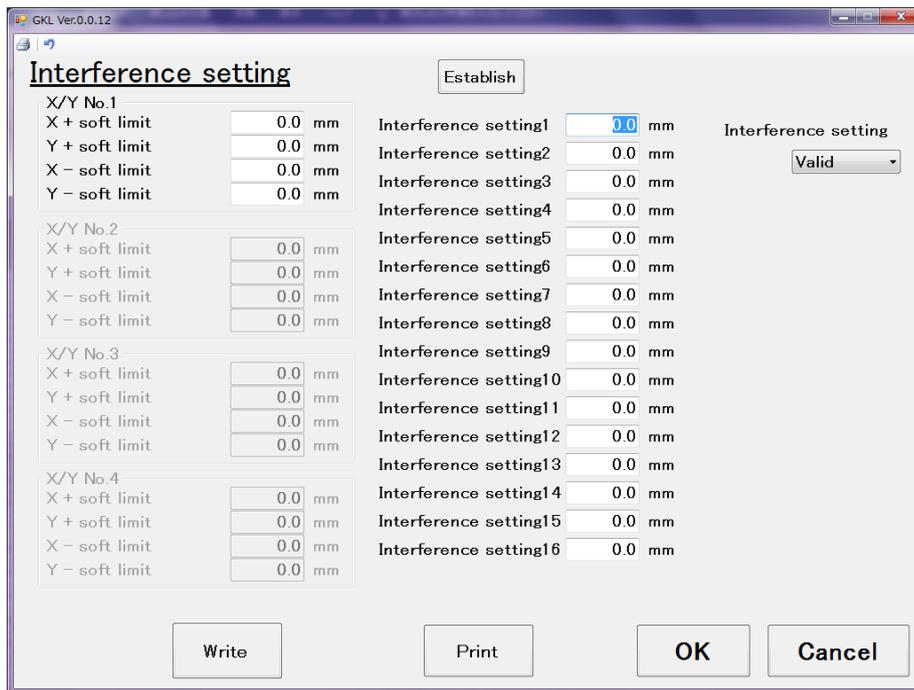
Fig.(4-17):Interference setting

[Item]
・X axis + soft limit, X axis - soft limit,
  Y axis + soft limit, Y axis - soft limit (Input range: -3276.7 to 3276.7)
   : Here we set the operable area for each direction of the X and Y axes.
     Coordinates exceeding this value can not be registered manually.
     When it tries to move to a point where the coordinate value exceeds this range,
      the software limit position is regarded as the target position and it operates.
     No abnormality is output after operation.
     Judge that operation has ended normally and proceed to the next step.

・Adjacent interference distance setting
   : This setting selects whether it uses or does not use
      adjacent interference distance setting.

[Button]
・Establish   It establish the change contents.

・Write   It displays the writing screen of Interference setting

・Print   It runs the printing of Interference setting

・O K   It retains the changes and returns
                                 to the XY point setting screen.

・Cancel   It returns to the XY point setting screen
                                 without holding the change contents.

Print screen: Print the current screen as it is.

Undo: Undo changes.

・interference setting① - ⑯ (Input range: 0 to 32767)
: This sets the interference distance with the adjacent positioning unit.
　The X and Y axes that have entered the specified adjacent interference distance stop.
　In this setting, the location of the distance indicated by each number changes
　　according to the setting of the equipment type "Fn.6 - 00".
　When entering the adjacent interference distance and exceeding
　　the interference wait abnormality setting of the timer setting screen,
　　"interference wait error" is output to the PLC.

①Standard equipment
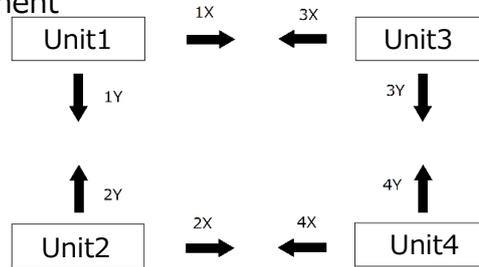
Unit arrangement example of standard equipment

If you set "0000" with "Fn.6 - 00", it will be recognized as GKL standard equipment.
Maximum values that do not interfere in the X axis direction of each unit
 in the above figure are 1X, 2X, 3X, and 4X, respectively.
Assuming that the maximum values that do not interfere in the Y axis direction are
 1Y, 2Y, 3Y, 4Y, the values indicated by each number at this time are as follows.

Interference setting①
The distance that unit 1 and unit 3 interfere as it moves further in the X axis direction
This calculates the value to be set by the formula of "setting value = 1X + 3X".

Interference setting②
Distance to interfere if unit 1 and unit 2 advance further in the Y axis direction
This calculates the value to be set by the expression "setting value = 1Y + 2Y".

Interference setting③
Distance to interfere if unit 2 and unit 4 move further in the X axis direction
This calculates the value to be set by the formula of "setting value = 2X + 4X".

Interference setting④
Distance to interfere if unit 3 and unit 4 move further in the Y axis direction
This calculates the value to be set by the formula of "setting value = 3Y + 4Y".

Interference setting⑤
Distance to interfere if unit 2 and unit 3 go further in the X axis direction
This calculates the value to be set by the formula of "setting value = 2X + 3X".

Interference setting⑥
Distance at which the unit 2 and the unit 3 interfere as it proceeds further
 in the Y axis direction
This calculates the value to be set by the expression of "setting value = 2Y + 3Y".

Interference setting⑦
The distance that unit 1 and unit 4 interfere as it moves further in the X axis direction
This calculates the value to be set by the expression "setting value = 1X + 4X".

Interference setting⑧
Distance to interfere if unit 1 and unit 4 go further in the Y axis direction
This calculates the value to be set by the expression "setting value = 1Y + 4Y".

Interference setting⑨～⑯　　　　　　　　　There is no need to set it because it is a spare.

②Special facilities 1
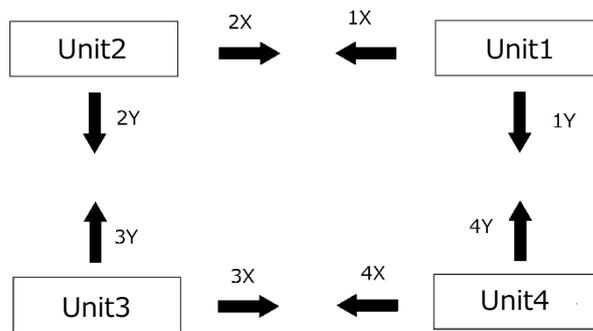
Unit arrangement example of special equipment 1
If you set "0001" with "Fn.6 - 00", it will be recognized as special equipment 1 in GKL.
Maximum values that do not interfere in the X axis direction of each unit
 in the above figure are 1X, 2X, 3X, and 4X, respectively.
Assuming that the maximum values that do not interfere in the Y axis direction are
 1 Y, 2 Y, 3 Y, and 4 Y, the respective values indicated by the interference distances are
 as follows.

interference setting①
The distance that unit 1 and unit 2 interfere as it moves further in the X axis direction
This calculates the value to be set by the formula of "setting value = 1X + 2X".

Interference setting②
Distance at which the unit 2 and the unit 3 interfere as it proceeds further
 in the Y axis direction
This calculates the value to be set by the expression of "setting value = 2Y + 3Y".

Interference setting③
Distance to interfere if unit 3 and unit 4 move further in the X axis direction
This calculates the value to be set by the formula of "setting value = 3X + 4X".

Interference setting④
Distance to interfere if unit 1 and unit 4 go further in the Y axis direction
This calculates the value to be set by the expression "setting value = 1Y + 4Y".

Interference setting⑤
The distance that unit 1 and unit 3 interfere as it moves further in the X axis direction
This calculates the value to be set by the formula of "setting value = 1X + 3X".

Interference setting⑥
Distance at which the unit 1 and the unit 3 interfere as it proceeds further
 in the Y axis direction
This calculates the value to be set by the expression of "setting value = 1Y + 3Y".

Interference setting⑦
Distance to interfere if unit 2 and unit 4 move further in the X axis direction
This calculates the value to be set by the formula of "setting value = 2X + 4X".

Interference setting⑧
Distance to interfere if unit 2 and unit 4 move further in the Y axis direction
This calculates the value to be set by the formula of "setting value = 2Y + 4Y".

Interference setting⑨～⑯   There is no need to set it because it is a spare.

③Special facilities 2
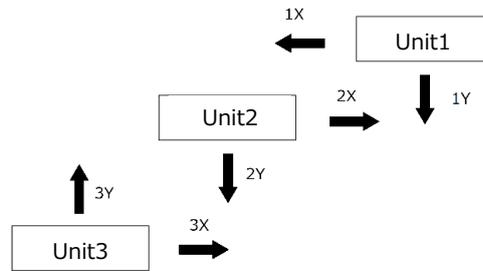
Unit arrangement example of special equipment 2

If you set "0002" with "Fn.6-00", it will be recognized as special equipment 2 in GKL.
Maximum values that do not interfere in the X axis direction of each unit
 in the above figure are 1X, 2X, 3X, and 4X, respectively.
Assuming that the maximum values that do not interfere in the Y axis direction are
 1Y, 2Y, 3Y, 4Y, the values indicated by each number at this time are as follows.

Interference setting①
The distance that unit 1 and unit 2 interfere as it moves further in the X axis direction
This calculates the value to be set by the formula of "setting value = 1X + 2X".

Interference setting②
The distance in the Y direction when unit 1 and unit 2 are brought closer to each other
 as they advance further in both the X axis direction and the Y axis direction.
This calculates the value to be set by the expression of "setting value = 2Y - 3Y".

Interference setting③
Distance to interfere if unit 2 and unit 3 go further in the X axis direction
This calculates the value to be set by the formula of "setting value = 2X - 3X

Interference setting④
The distance in the X direction when unit 2 and unit 3 are brought closer to each other
 as they advance further in both the X axis direction and the Y axis direction.
This calculates the value to be set by the expression of "setting value = 2Y + 3Y

Interference setting⑤
The distance in the X direction when unit 1 and unit 2 are advanced by both the X axis
direction and the Y axis direction as far as they interfere with each other.
This calculates the value to be set by the formula of "setting value = 1X + 2X".

Interference setting⑥
The distance in the X direction when unit 2 and unit 3 are brought closer to each other
 as they advance further in both the X axis direction and the Y axis direction.
This calculates the value to be set by the formula of "setting value = 2X - 3X

Interference setting⑦～⑯   There is no need to set it because it is a spare.

4-2-5.Timer setting

When you select "Timer setting" from "Position setting", the timer setting screen opens.
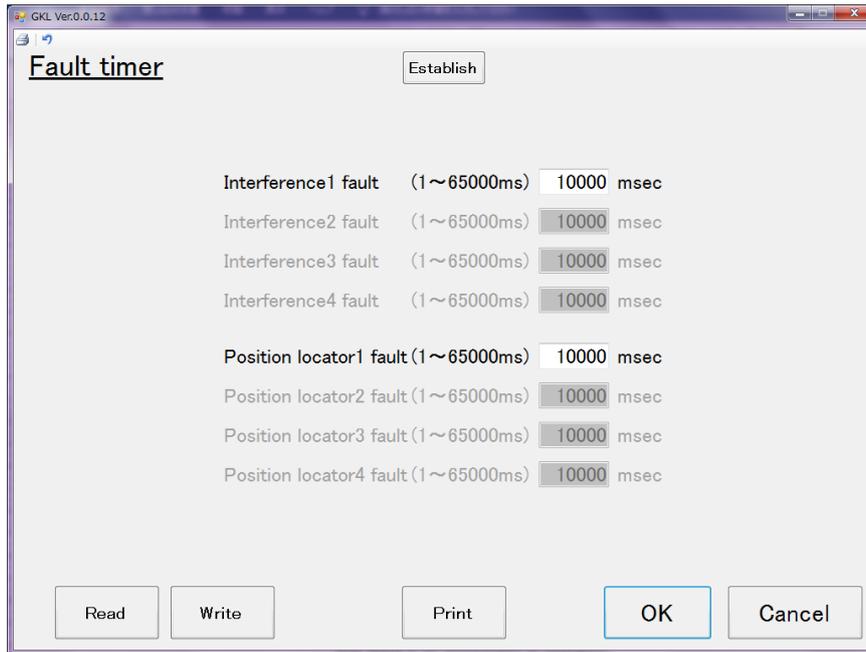
Fig. (4-18):Timer setting

Interference fault ⇒ When the standby time due to the setting
in the adjacent interference area exceeds this set value,
GKL judges that there is an abnormality in operation
and outputs "Interference wait error" signal.
When this signal is output, GKL will not send other notifications.

Positioning locator fault ⇒ If the JOG operation and the MOV_X MOV_Y MOV_XY operation
are not completed within this time, the GKL judges
that there is an abnormality in operation
and outputs a "positioning error" signal.
When this signal is output, GKL will not send other notifications.

[Item]
・Interference 1 fault   It sets the interference waiting abnormality of the abnormal unit 1.

・Interference 2 fault   It sets the interference waiting abnormality of the abnormal unit 2.

・Interference 3 fault   It sets the interference waiting abnormality of the abnormal unit 3.

・Interference 4 fault   It sets the interference waiting abnormality of the abnormal unit 4.

・Positioning locator 1 fault   It sets the positioning abnormality of the abnormal unit1.

・Positioning locator 2 fault   It sets the positioning abnormality of the abnormal unit 2.

・Positioning locator 3 fault   It sets the positioning abnormality of the abnormal unit 3.

・Positioning locator 4fault   It sets the positioning abnormality of the abnormal unit 4.

[Button]
・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.

Print screen: Print the current screen as it is.

Undo: Undo changes.

4-3.Nutrunner setting

When you select "Nut runner Setting" from "Setting menu",
the following screen will be displayed.
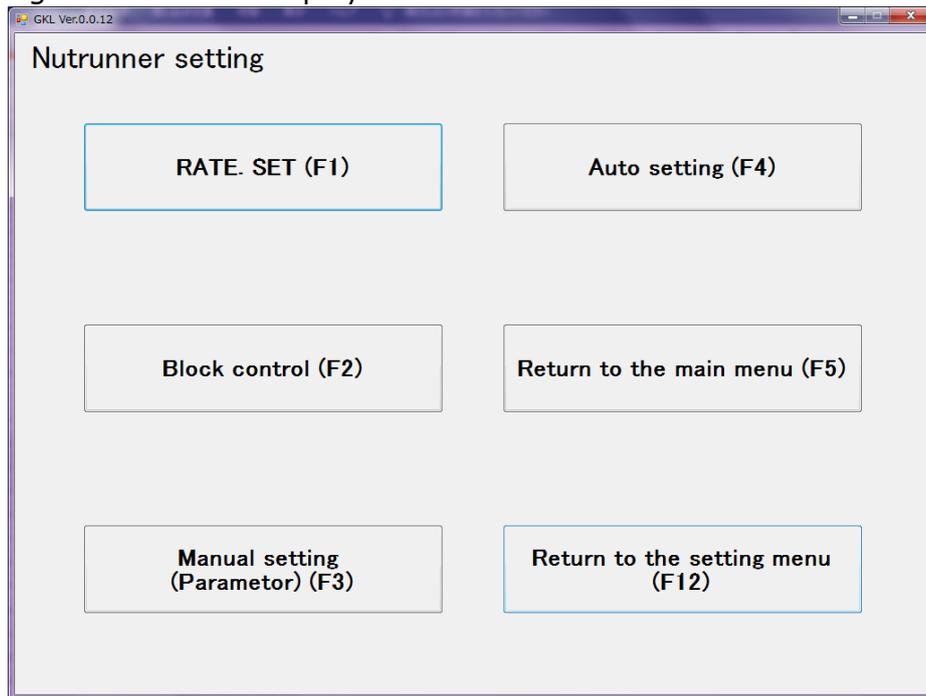
Fig. (4-19):Nut runner setting

[Button]
・RATE.SET(F1)
　Here, we set the rated data of the nut runner to be used.

・Block control(F2)
　This displays the block setting management screen used for program setting.

・Manual setting(Parametor)(F3)
　This sets each tightening motion.

・Auto setting (F4)
　In this case, the tightening data required for auto setting is set,
　and the tightening data is automatically created based on it.

・Return to the main menu(F5)
　When this button is pushed, it returns to the main menu.

・Return to the setting menu(F12)
　When this button is pressed, it returns to the setting menu.

4-3-1.RATE.SET

When the screen is selected "Rating setting" from "Nut runner setting menu"
it will be the screen shown below.
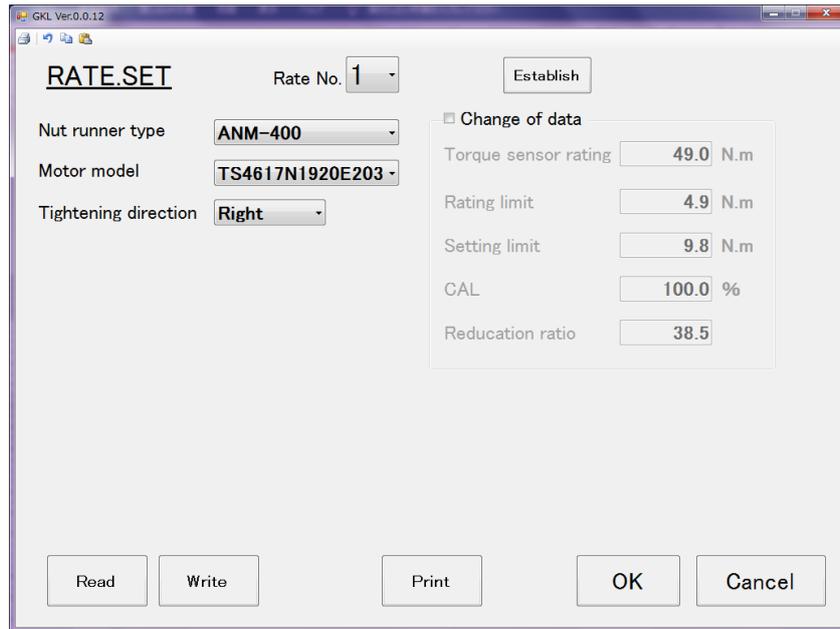
Fig.(4-20):RATE.SET screen

[Item]
・Rate No.   You select the rated number to set.

・Nut runner type   You select the type of nutrunner to use.
   ※If you select the Nutrunner model, the motor model and the details on the right side
      of the above figure become to the corresponding values.

・Motor model   You select the motor model to use.

・Tightening derection   This sets the direction of rotation in PRE.T and REA.T
                        operation of the nut runner.

Details:
   ・Torque sensor rating (input range: 0 to 6550)
      This shows the maximum torque of the nut runner to be used.

   ・Rating limit (input range: 0 to 3276.7)
      This is a tolerance of variation during current check.

   ・Setting limit (Input range: 0 to 3276.7)
      This is the maximum value of the allowable current output value during current check.

   ・CAL (Input range: 0 to 3276.7)
    It is a coefficient to set so that the display value of the reference instrument
      and GKL monitor value are the same.

   ・Reduction ratio (input range: 0 to 9999)
      This shows the reduction ratio of the nut runner.

[Button]
・Establish   It establish the change contents.

・Read   It displays the loading screen of Rate setting

・Write   It displays the writing screen of Rate setting

・Print   It runs the printing of Rate setting

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

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

 Print screen: Print the current screen as it is.

 Undo: Undo changes.

 Copy: It copies the setting contents for each setting number.

 Paste: It pastes the information acquired by copying
            to the specified setting number.

4-3-2.Block control

When you select "Block Management" from "Nut Runner Setting Menu",
  the following screen will be displayed.
You need to create a block to set up tightening behavior in the program
  and register the block to use for the axis.
Here we edit and delete that block and register on each axis.
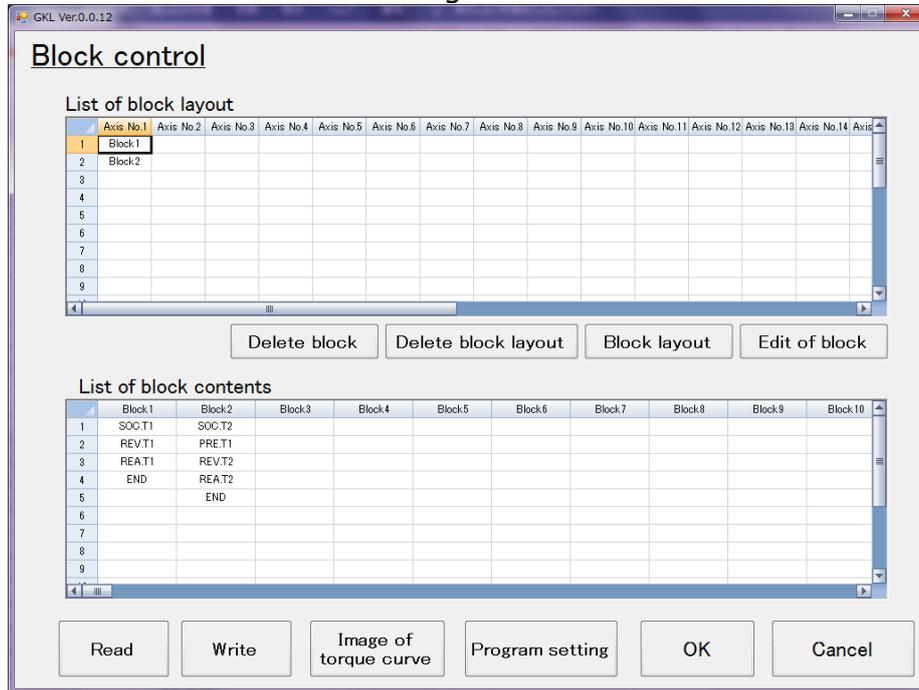
Fig.(4-21):Block control screen

[Item]
　・List of block layout　　　　　This displays the blocks registered for each axis.

　・List of block c0ntents　　　　This shows the composition of the created block.

[Button]
　　・Delete block
　　　This deletes the currently selected block in the block contents list.
　　　The block to be deleted turns yellow when selected before deleting.

　　・Delete block layout
　　　This deletes the block selected in the block allocation list.
　　　When selected for each cell, the block in the currently selected cell is deleted,
　　　　and when the axis number is selected, all the blocks registered
　　　　on that axis are deleted.
　　　※You can substitute Delete key and Back space key for the function of this button.
　　　　　However, in that case, it can only delete per cell.

　　・Block layout
　　　The created block is stored in the selected cell on the list of block layout.
　　　This means that the block is registered to the axis number
　　　　to which the stored cell belongs.
　　　※If you enter a number directly in the selected cell on the list of block layout,
　　　　　the block number of that number is registered.

　・Edit of block
　　　This opens the block edit screen and edits and creates the contents of each block.

・Read   It displays the loading screen of Block control.

・Write   It displays the writing screen of Block control.

・Image of torque curve
　This displays the waveform image screen of the selected block.
　You can also change the settings on the screen that opens here.

・Program setting
　When this button is pressed, you go to the program setting screen.

・O K
　It is to accept the changes and return to the Nut runner setting menu.
　※If you come to this screen from the program setting, you will return
　　to the program setting screen.

・Cancel
　It erases the changes and return to the Nut runner setting menu.
　※If you come to this screen from the program setting, you will return
　　to the program setting screen.

4-3-2-1.Edit of block
When you press the block edit button, the following block edit screen will be displayed.
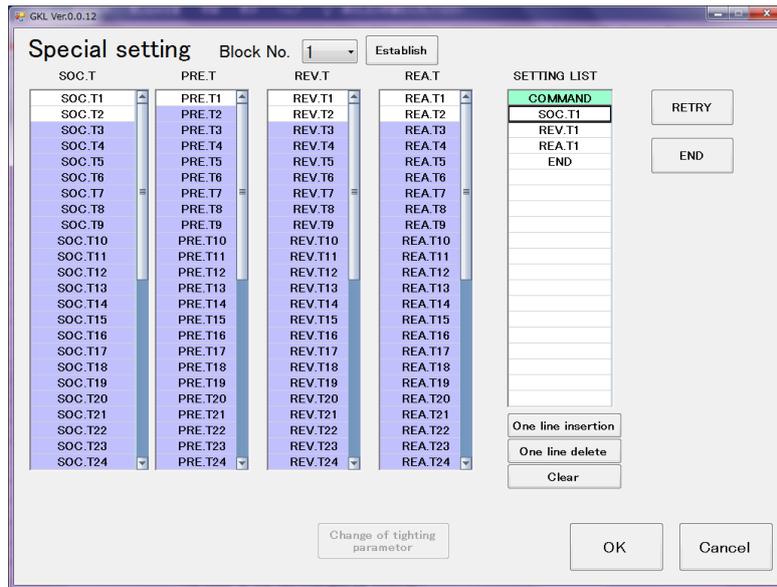
Fig.(4-22): Edit of Block

Here, if you select the setting number from "SOC.T, PRE.T, REV.T, REA.T" list,
 the tightening motion is stored in the setting list on the right side of the screen.
If you press the retry button, a retry command is entered,
 and when the end button is pressed, the end command is stored in the setting list.
This setting list becomes a block.

　※The insertion method of the command has difference by the cell color difference.
　　Yellow overwrites, white inserts into the selected cell, and shifts
　　 the following commands down.
　　The color of the cell changes by clicking.

　注）The setting of each tightening operation is white as input,
　　　 and purple as not yet input.
　　　If you select by right click or when you select an unentered action,
　　　 it becomes yellow as currently selected, but it is not inserted in the setting list.

[Button]
・Establish
　Normally it is used to confirm the change, but this function can not be used
　on this screen.

　・RETRY
　　It inserts a retry command into the configuration list.
　　If the operation above the retry command within the block does not yield NG,
　　　the block is terminated as is, and if NG occurs,
　　　the operation below the retry is performed.

　・END
　　It inserts an end command into the configuration information.
　　This command is used to make it recognize that the entire operation
　　　of the block has ended.
　　Even if it is not inserted in the setting information list by the command,
　　　it is automatically inserted at the end of the block when setting is completed.

　・One line insertion
　　It inserts an empty cell in front of the currently selected cell in the setting list.

　・One line delete
　　It deletes the currently selected cell in the setting list.
　　The commands lower than the delete command are moved up
　　　by the deleted command.

SETTING LIST		SETTING LIST
COMMAND		COMMAND
SOC.T1	Push the "One line delete" button	PRE.T1
PRE.T1		REV.T1
REV.T1		REA.T1
REA.T1		SOC.T1
SOC.T1		END
END		
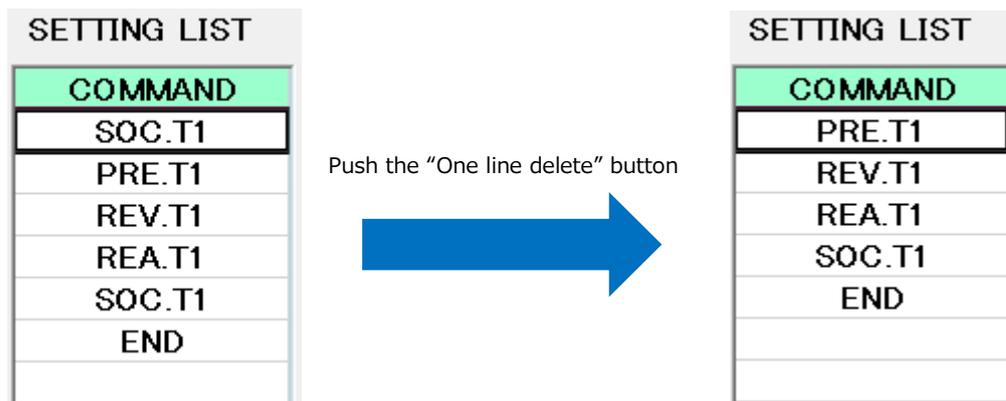
Fig.(4-23): Change due to "One line delete"

　・Clear
　　It deletes all commands in the setting list.

　・Change od tightening parametor
　　It moves to the setting screen of the operation being selected
　　　in the tightening operation list.

　・O K
　　It is to accept the changes and return to the Block control screen.

　・Cancel
　　It erases the changes and return to the Block control screen.

4-3-3.Manual setting

When you select "Manual setting [Parameter]" from "Nutrunner setting", the following screen will appear.
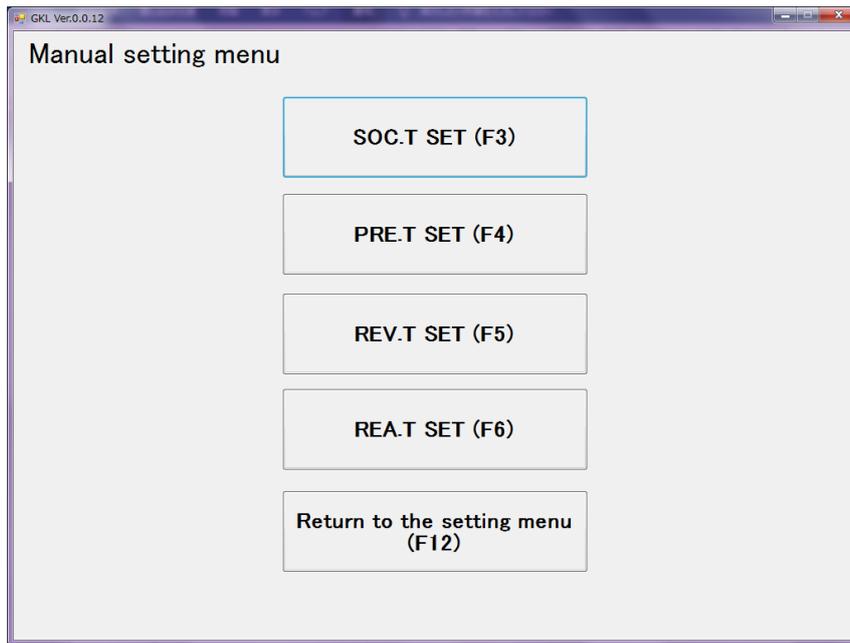
Fig.(4-24):Manual setting

[Button]
・SOC.T SET(F3)
　When this button is pushed, the SOC.T SET screen is displayed.

・PRE.T SET(F4)
　When this button is pushed, the PRE.T SET screen is displayed.

・REV.T SET(F5)
　When this button is pushed, the REV.T SET screen is displayed.

・REA.T SET(F6)
　When this button is pushed, the REA.T SET screen is displayed.

・Return to the setting menu(F12)
　When this button is pushed, it will return to the Nut runner setting screen.

4-3-3-1.SOC.T SET

When you select "SOC.T SET" from "Manual setting menu (Parametor)",
the following screen is displayed.
Here, we set up the operation of "SOC.T".
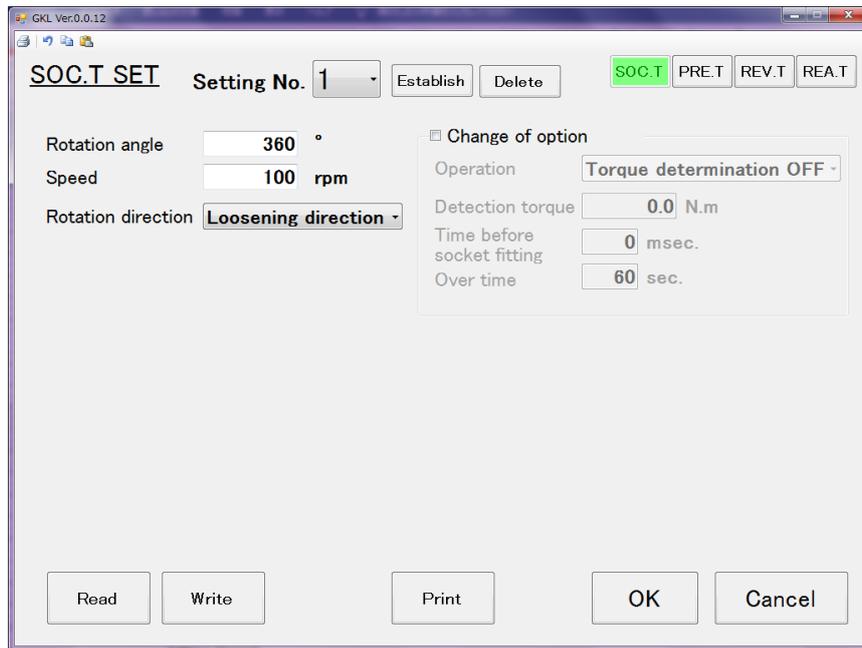
Fig.(4-25):SOC.T SET screen

※You can move to "PRE.T", "REV.T", "REA.T" with the button on the upper right
of this screen.

[Item]
・Rotation angle　　　　　　　It sets the operating angle during SOC.T operation.

・Speed　　　　　　　　　　It sets the rotation speed at SOC.T operation。

・Rotation direction
　This sets the direction of rotation during this operation.
　The direction set here varies to the rate setting to use.

・Change of option
　By setting a check here, you can set the function in the SOC.T operation
　such as changing the operation type.

　・Operation
　　This selects the operation type of SOC.T from among the 4 below.

　　・Torque determination OFF
　　　⇒Normal operation will not be performed based on the detected torque value.
　。

　　・Fiting
　　　⇒This function confirms that the socket has entered the screw head.
　　　　If it does not reach the detection torque value during the rotation angle,
　　　　　it becomes NG.

　　・Gear check
　　　⇒ That confirms the state of the gear of the nut runner.
　　　　When it reaches the detection torque value, it stops working
　　　　　and becomes NG.

・Detection torque
　Here, we set the torque value to be used for gear check and fitting judgment.

・Time before socket fitting
　This sets the waiting time before the SOC.T operation starts

・Over time
　This sets the maximum operation time of the SOC.T operation.
　If the operation does not end before this time, the operation is terminated
　and the NG judgment is output.。

※If the rotation angle is zero, it is assumed that the SOC.T operation is not set
　and input check is not executed.

[Button]
・Establish
　It establish the change contents.

・Delete
　This function returns all values of the setting No. being displayed before changing.

・Read
　It displays the setup reading screen of the SOC.T setting.

・Write
　It displays the setup writing screen of SOC.T setting.

・Print
　It will print socket alignment settings.
　Printing is done in a dedicated format.

・O K
　It is to accept the changes and return to the Manual setting screen.

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

 Print screen: Print the current screen as it is.

 Undo: Undo changes.

 Copy: It copies the setting contents for each setting number.

 Paste: It pastes the information acquired by copying
　　　　　　to the specified setting number.

4-3-3-2.PRE.T SET

When you select "PRE.T SET" from "Manual setting menu (Parametor)",
 the following screen is displayed.
Here, we set up the operation of "PRE.T".
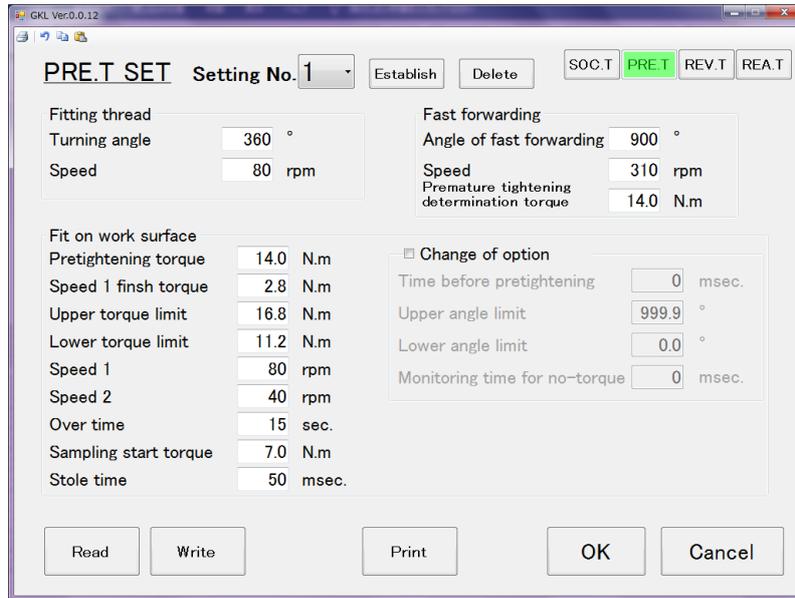
Fig.(4-26):PRE.T SET screen

※You can move to "SOC.T", "REV.T", "REA.T" with the button on the upper right
　of this screen.

[Item]
Fitting thread
This is the operation to align the screw with the screw hole.

・Turning angle
　This sets the rotation angle during screw alignment operation.

・Speed
　This sets the rotation speed during screw alignment operation.

Fast forwarding
This is the operation to turn the screw up to near the seating at high speed.

・Angle of fast forwarding
　This sets the rotation angle during fast forward operation.
　It shows the turning angle until the screw head is seated.

・Speed
　This sets the rotation speed during fast forward operation.
　It is almost no-load rotation until the screw head is seated.
　Therefore, it sets possible high speed with the nut runner.

・Premature tightening determination torque
　Normal torque does not reach during fast forward operation
　 which should be no load rotation.
　When this set torque has passed during fast-forward operation, it is judged
　 to be abnormal and fast-tightening NG is output.

Fit on work surface
This is an operation section from the end of fast forward to the end of PRE.T.

・Pretightening torque
　This sets the target torque in the PRE.T motion.
　The PRE.T operation is terminated by reaching this torque.

・Speed 1 finish torque
　This sets the torque to switch from Speed 1 to Speed 2.

・Upper torque limit
　This sets the torque value to be used for torque over judgment.

・Lower torque limit
　This sets the torque value to be used for torque under judgment.

・Speed 1
　This sets the speed until the torque sits from the end of fast forward.

・Speed 2
　This sets the final speed up to the target torque of this operation.

・Over time
　This sets the maximum operation time of the PRE.T operation.
　If the operation does not end before this time, the operation is terminated
　　and the NG judgment is output.

・Sampling start torque
　This sets the torque to start angle measurement.

・Stole time
　When the tightening torque reaches the cut torque, it is necessary
　　to maintain the tightening torque for a certain time
　　so that the torque does not decrease.
　Here we set the holding time.

Change of option
・Time before PRE.T
　This sets the wait time until this operation starts.

・Upper angle limit
　This measures the tightening angle from the sampling starting torque.
　If the measurement angle exceeds this setting value, angle over NG is output.

・Lower angle limit
　This measures the tightening angle from the sampling starting torque.
　If the measured angle does not exceed this set value, angle under NG is output.

・Monitoring time for no-torque
　This sets the time when torque judgment is not made from the start of operation.

※If speed 1 and speed 2 are both zero, it is assumed that PRE.T operation is not set.
　In the PRE.T SET screen, the input check is performed under the following conditions.
　You can not set contrary to the input rule by input check.
　However, when it is judged that it is not set, it does not perform input check.
[input condition]
・ Overtime> = 1
・ Fast-forward angle >= rotation angle
・ Upper angle limit > Lower angle limit
・ PRE.T torque > Sampling start torque
・ Upper torque limit > PRE.T torque > Lower torque limit

[Button]
　・Establish
　　It establish the change contents.

　・Delete
　　This function returns all values of the setting No. being displayed before changing.

　・Read
　　It displays the setup reading screen of the PRE.T setting.

　・Write
　　It displays the setup writing screen of PRE.T setting.

　・Print
　　It will print PRE.T settings.
　　Printing is done in a dedicated format.

　・O K
　　It is to accept the changes and return to the Manual setting screen.

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

Print screen: Print the current screen as it is.

Undo: Undo changes.

Copy: It copies the setting contents for each setting number.

Paste: It pastes the information acquired by copying
　　　　to the specified setting number.

4-3-3-3.REV.T SET
    When you select "REV.T SET" from "Manual setting ", the following screen is displayed.
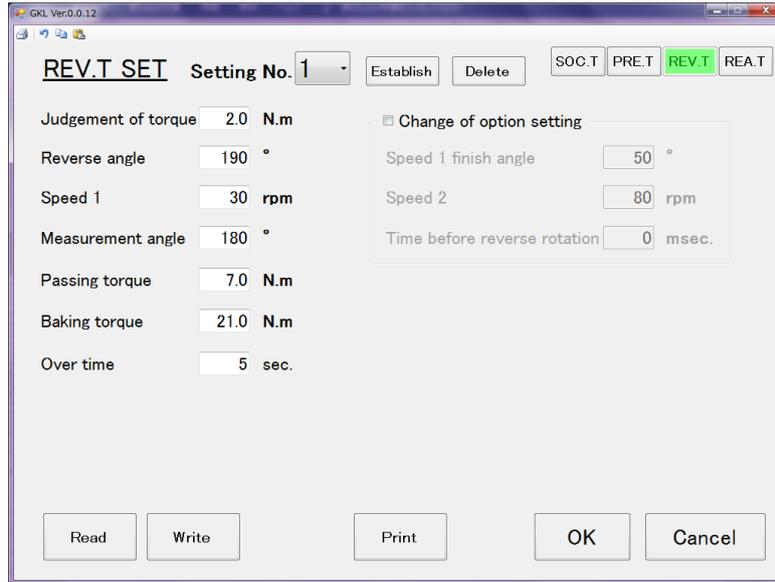
Fig.(4-27):REV.T SET screen

※You can move to "SOC.T", "PRE.T", "REA.T" with the button on the upper right
    of this screen.

[Item]
・Judgment of torque
    It sets the measurement angle so as to measure at no-load rotation.
    It judges whether the torque at that time exceeds this set value or not.

・Reverse angle
    This sets the movement angle in this operation.

・Speed 1
    This sets the rotation speed at the start of the REV.T operation.

・Measurement angle
    This sets the angle from the start of operation to judge the state of the screw
     using the judgment torque.

・Passing torque
    It is the torque to judge whether it was tightened correctly before this operation.
    If the slackening torque does not exceed this torque even once,
     the NG judgment is output.

・Baking torque
    Screws may be seized in the previous tightening operation.
    This setting is the torque to confirm that it is baked.

・Over time
    This sets the maximum operation time of the REV.T operation.
     If the operation does not end before this time, the operation is terminated
      and the NG judgment is output.

Option
・Speed 1 finish angle
    When loosening the fastened screw with high torque, you need to loosen it
     at low speed immediately after starting operation.
    This setting value is the starting point for switching from low speed to high speed.

・Speed 2
  When loosening the tightened screw, the no-load rotation is performed
   after the torque has come off.
  This setting will be the speed for high-speed rotation at that time.

・Time before reverse rotation
  This sets the standby time before the REV.T operation starts.

※If the Reverse angle is zero, we regard it as not set for the REV.T operation.
  In the REV.T SET screen, the input check is performed under the following conditions.
  However, when it is judged that it is not set, it does not perform input check.

・Over time >= 1

・Reverse angle >= Measurement angle

・Reverse angle >= Speed 1 finish angle

[Button]
・Establish
  It establish the change contents.

・Delete
  This function returns all values of the setting No. being displayed before changing.

・Read
  It displays the setup reading screen of the REV.T setting.

・Write
  It displays the setup writing screen of REV.T setting.

・Print
  It will print REV.T settings.
  Printing is done in a dedicated format.

・O K
  It is to accept the changes and return to the Manual setting screen.

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

 Print screen: Print the current screen as it is.

 Undo: Undo changes.

 Copy: It copies the setting contents for each setting number.

 Paste: It pastes the information acquired by copying
          to the specified setting number.

4-3-3-4.REA.T SET

When you select "REA.T SET" from "Manual setting" the following screen is displayed.

Fig.(4-28):REA.T SET screen

※You can move to "SOC.T", "PRE.T", "REV.T" with the button on the upper right
  of this screen.

[Item]
・Reatightening torque
  This sets the target torque value in the REA.T operation.

・Sampling start torque
  This sets the torque to start angle measurement.

・Speed 1
  This sets the speed 1 value of the REA.T motion.

・Speed 1 finish angle
  This sets the angle value to switch to Speed 2 after finishing Speed 1.

・Speed 2
  This sets the rotation speed of speed 2.

・Over time
  This sets the maximum operation time of the REA.T operation.
  If the operation does not end before this time, the operation is terminated
  and the NG judgment is output.

・Upper torque limit
  This sets the torque value to be used for torque over judgment.

・Lower torque limit
  This sets the torque value to be used for torque under judgment.

・Stole time
  When the tightening torque reaches the cut torque, it is necessary
  to maintain the tightening torque for a certain time
  so that the torque does not decrease.
  Here we set the holding time.

・Over cutting angle
　　This sets the maximum movement angle of the REA.T motion.
　　When this angle is reached, this operation is terminated.

※This setting value will not output NG judgment.
　　If tightening condition is satisfied even a little, please note that OK judgment output.

Option
・Time before final tightening
　　This sets the time until the REA.T operation starts

・Upper angle limit
　　This measures the tightening angle from the sampling starting torque.
　　If the measurement angle exceeds this setting value, angle over NG is output.

・Lower angle limit
　　This measures the tightening angle from the sampling starting torque.
　　If the measured angle does not exceed this set value, angle under NG is output.

・Premature tightening determination angle
　　This sets the angle to be used for judging the fast-tightening abnormality.
　　If the final tightening torque is detected before the angle from the start
　　 of operation exceeds this set value, NG of the quick tightening will be output.

・Monitoring time for no-torque
　　This sets the time when torque judgment is not made from the start of operation.

Option mode of speed 3, 4
　　・Speed 3 select angle
　　　　This is the angle to switch to Speed 3.

　　・Speed 3
　　　　This sets the rotation speed of Speed 3.

　　・Speed 4 select torque
　　　　This sets the torque value to switch from Speed 3 to Speed 4.

　　・Speed 4
　　　　This sets the rotation speed of Speed 4.

※If the Reatightening torque is zero, we regard it as not set for the REA.T operation.
　　In the REA.T SET screen, the input check is performed under the following conditions.
　　However, when it is judged that it is not set, it does not perform input check.

・ Overtime> = 1

・ Upper angle limit > Lower angle limit

・ Upper torque limit > PRE.T torque > Lower torque limit

[Button]
・Establish
  It establish the change contents.

・Delete
  This function returns all values of the setting No. being displayed before changing.

・Read
  It displays the setup reading screen of the REA.T setting.

・Write
  It displays the setup writing screen of REA.T setting.

・Print
  It will print REA.T settings.
  Printing is done in a dedicated format.

・O K
  It is to accept the changes and return to the Manual setting screen.

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

 Print screen: Print the current screen as it is.

 Undo: Undo changes.

 Copy: It copies the setting contents for each setting number.

 Paste: It pastes the information acquired by copying
                to the specified setting number.

4-3-4.Auto setting

When you select "Auto setting" from "Nutrunner setting",
the screen shown below will be displayed.
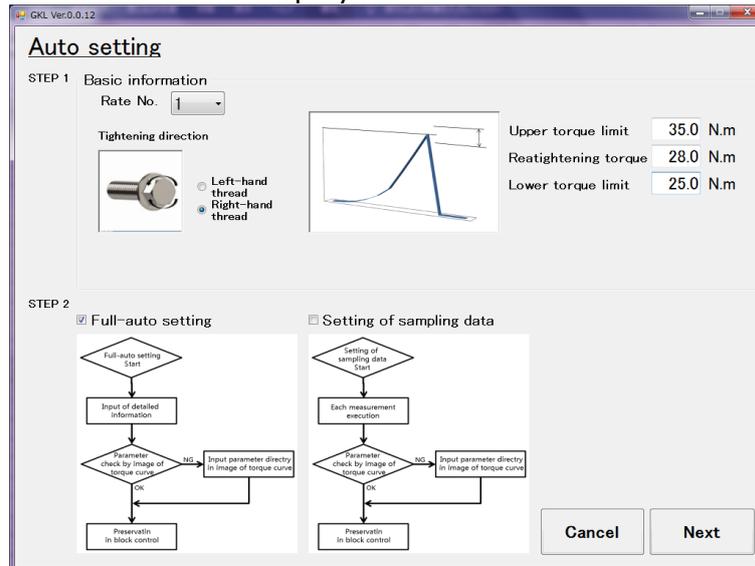
Fig.(4-29):Auto setting screen

STEP1 :
Here, you enter basic information to perform auto setting.
Basic information refers to the rated number of NR to be used, screw tightening direction,
  tightening method of REA.T, target torque, upper torque limit value,
  lower torque limit value.

STEP2 :
"Full-auto setting" or "Setting of sampling data" is selected.

[Button]
・Cancel
  It is to accept the changes and return to the Nut runner setting screen.

・NEXT
  The page of the destination is different by selecting the setting method of STEP 2.

  ・In the cace of "Full-auto setting"
    When full auto setting is selected, the "Standard setting" screen is displayed.
    There, it inputs "screw type, distance to seated, inclusion".

  ・In the cace of " Setting of sampling data"
    When " Setting of sampling data" is selected,
     the " Setting of sampling data" screen is displayed.
    There, it automatically performs sampling tightening and automatically performs
     the setting for the operation set by using the data detected from it.

4-3-4-1.Full-auto setting

If you select "Full-auto setting" in "Auto setting" and press "NEXT",
the "Standard setting" screen shown below will be displayed.
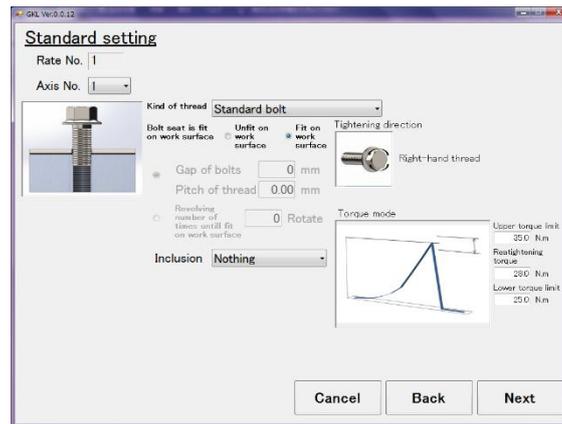
Fig.(4-30):Full-auto setting(Standard seting)screen

※Refer to "9-3. Preparation of tightening program" for setting flow chart.

[Item]
・Rate No.
　The rated number of the nut runner set on the "Full-auto setting" screen is displayed.

・Axis No.
　It selects axis number.
　It assigns the block you created to this axis.

・Kind of thread
　It selects the type of screw.

・Bolt seat is fit on work surface
　It chooses whether the bolt is seated or not.
　If it is seated, the only items you set are inclusions.
　In case of non-seating, it is necessary to set the distance(angle) to sit
　　in addition to that.

　・Gap of bolt
　　It sets the distance between the screw head and the workpiece seat.

　・Pitch of thread
　　It sets the screw pitch.

　・Revoling number of times until fit on work surface
　　It sets the number of revolutions until sitting.

・Inclusion
　It selects inclusions to enter between the screw and the seat.

[Button]
・Cancel
　It erases the changes and return to the Manual setting screen.

・Back
　It erases the changes and return to the previous setting screen.

・Next
　It creates a block and its behavior from this screen and the data set
　　on the previous screen.
　Then, the created block is displayed as a waveform image.

When you select "Next" on the "Standard setting" screen,
 the "Screen for image of torque curve" as shown below will be displayed.
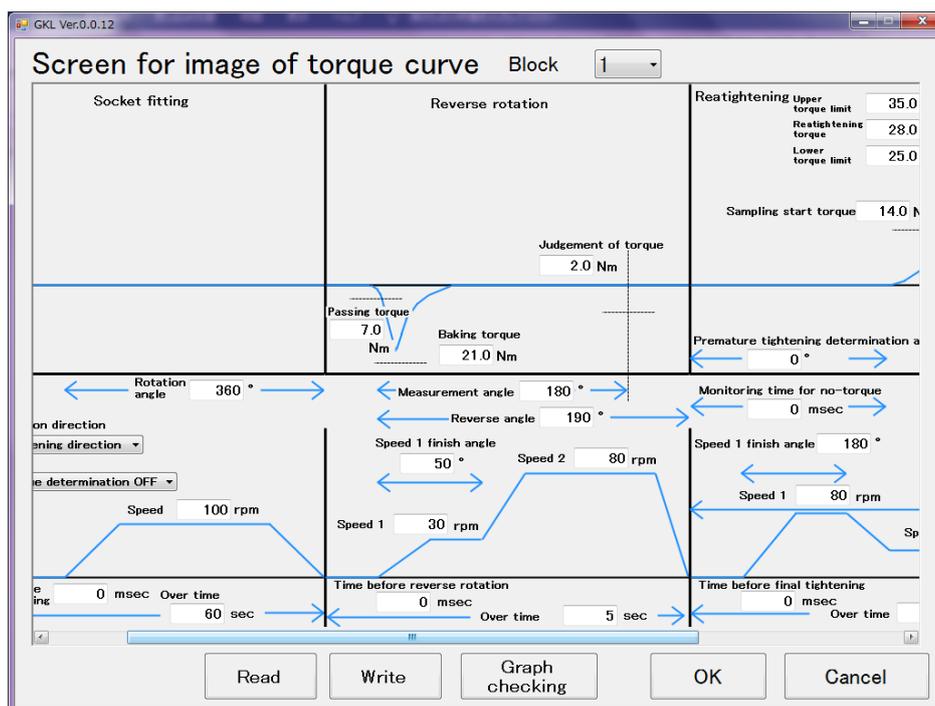
Fig.(4-31):Screen for image of torque curve

In this screen, you can change the behavior of the block created based on the previous setting while confirming it as a waveform.

※Please check the setting items of each operation about the contents of detailed setting.

[Button]
・Read
   This is the same operation as " Setting read" in the main menu.

・Write
   This is the same operation as " Setting write" in the main menu.

・Graph checking
   When this button is pushed, a simple waveform
    that reflects the set contents will be displayed.

・OK
   This holds the created block and each action and displays it
    on the Nut runner setting screen.

・Cancel
   This discards the created block and each action and returns to the previous screen.

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

When you select " Setting ofsampling data " with "Auto setting"
and press "NEXT", "SAMPLING SETTING" is displayed.
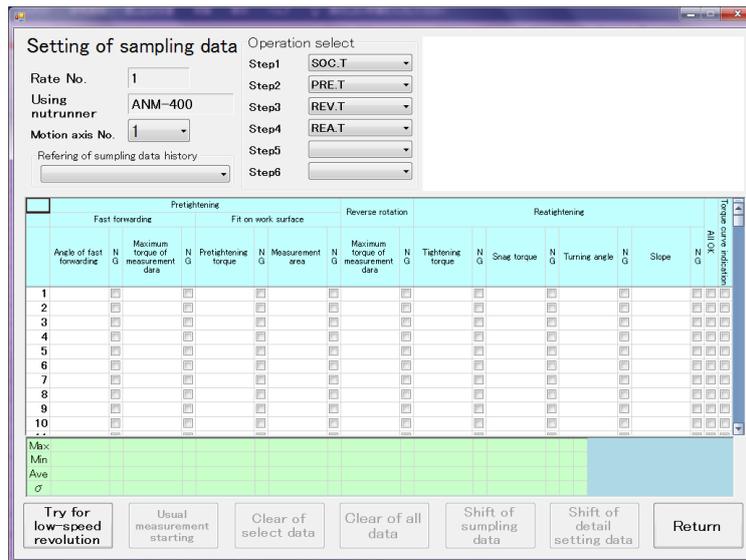
Fig.(4-32): Setting ofsampling data

※Please check the setting items of each operation about the contents of detailed setting.

①The 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.(4-33): During low speed rotation try

 ※1: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.
 ※2: 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".
②The 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.
   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.(4-34): Now on sampling

③If 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.(To④)
  When you'd like to gauge with the set value which was made with acquired data,
   a measurement starting button is usually pressed. (To ②)
  The screen upper right develops and is corrugated.

④It'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 select "Program Setting" from "Setting Menu".
When "Program Setting" is selected from "Setting Menu",
 "Select of maximum program number" screen will appear.
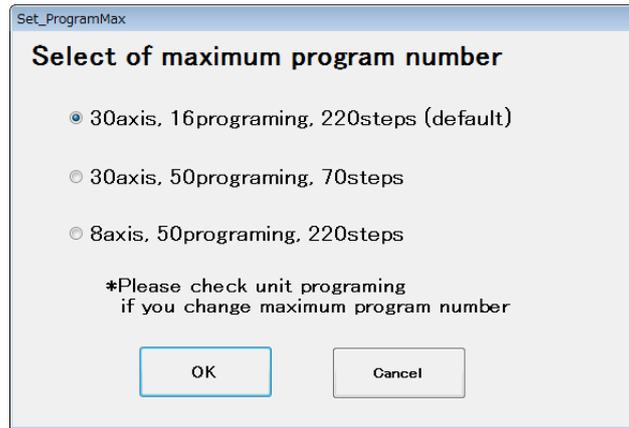
Fig.(4-35): Select of maximum program number

By default, "30 axes, 16 program No., 220 steps" is selected.
If you change the program Max value selection, you will need to recreate the program.
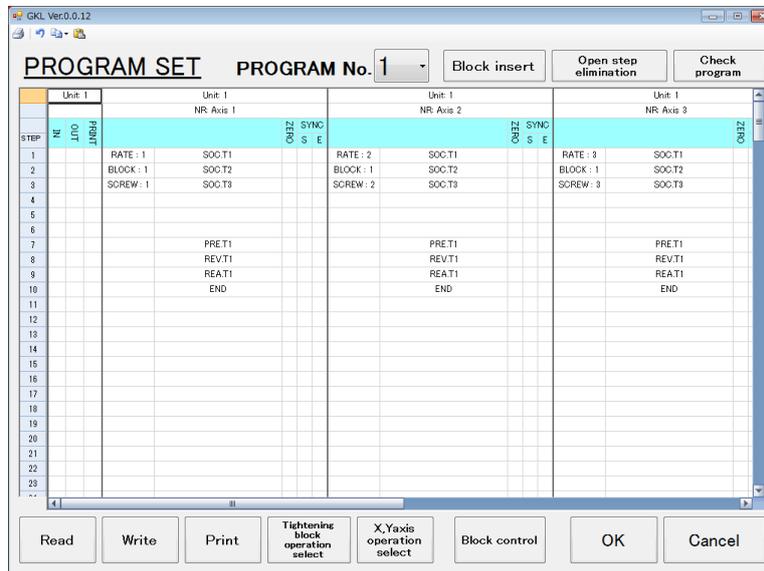
Fig.(4-36):Program setting

[Item]
 ・IN   It enables 'IN signal wait'.
                                It waits for this step to start until the IN signal is input
                                 from the outside.

 ・OUT   It outputs "OUT" signal after the operation is completed.
                                The "OUT" signal is stopped by input of the next "IN" signal.

 ・PRINT   After step execution, it will print the contents specified
                                 for the connected printer.

 ・(Program area)   The contents of the selected program number are displayed.

 ・ZERO   We will do zero check.

 ・SYNC-S   It synchronizes with other axes at the start of this step.

 ・SYNC-E   It will retighten at the end of this step.

[Button]
・Block incert   It inserts an empty block above the selected cell.

・Open step elimination   It deletes and packs the vacant steps of the selected axis.

・Check program   It checks whether the block used in the program has
                                    the same configuration as the block registered.

・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

・Tightening block operation select
  This displays the tightening block motion selection screen.
  On this screen you can select the block to be inserted into the program, synchronize etc.

・X,Y axis operation select
  The XY axis motion selection screen is displayed.
  On this screen, you can select the XYZ axis motion from the command list
   and set it to the program area selection step.

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

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

   Print screen: Print the current screen as it is.

   Undo: Undo changes.

   Copy: It copies the setting contents for each setting number.

   Paste: It pastes the information acquired by copying
            to the specified setting number.

4-4-1. Tightening block operation select

In "Program setting", select the block to be inserted in the program
on the "Tightening block operation select " screen.
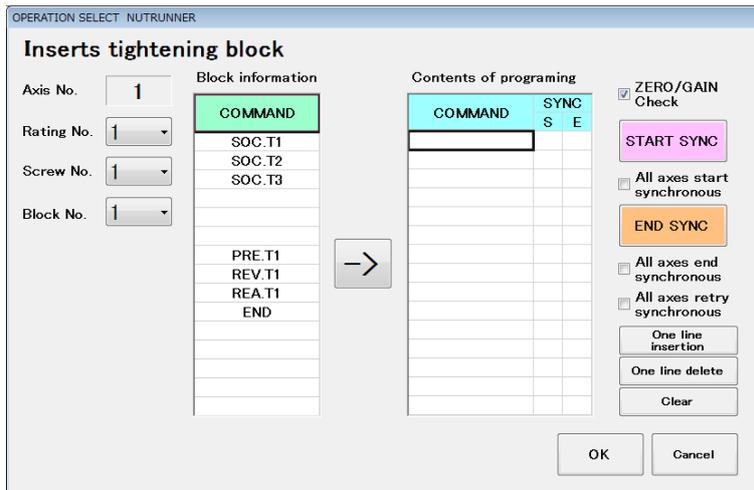
Fig.(4-37): "Tightening block operation select " screen

[Item]

・Axis No.   It displays the axis number where the tightening block is inserted.

・Rate No.   This specifies the rating number of the nut runner to be used
                  for the operation of the tightening block to be selected.

・Screw No.   This specifies the screw number to be tightened
                  with the tightening block.

・Block No.   This specifies the number of the tightening block to be inserted.

・→   This inserts the currently selected block information into the program.

・ZERO/GAIN Check
Before starting the block operation, it checks zero times the check function
of the torque sensor.

・START SYNC   It is to synchronize the steps next to each other.
                 It is effective only when there is positioning in the unit.
            ※If there is no positioning inside the unit, synchronize without setting it.

・All axes start synchronous
This enables start synchronization for all axes in the program.
※It can be confirmed that start synchronization is entered on all axes in the program.

・END SYNC   We will retighten after REA.T action.※REA.T step is effective only.

・All axes end synchronous
This enables all axis end synchronization for all axes in the program.
※You can confirm that the end synchronization is entered on all axes in the program.

・All axes retry synchronous
This function is effective only when Retry is selected in Block.
※when all-axis retry is set, if there is NG even for 1 axis,
all-axis retry processing will be done.

・OK
This enables the setting on this screen and returns to the program setting screen.

・Cancel
This discards the setting on this screen and returns to the program setting screen.

4-4-2. X,Y axis operation select

The following screen is displayed with "XY axis operation select" button
  from the setting screen.
You can select the XY action you want to set from the command
  and insert it into the program.
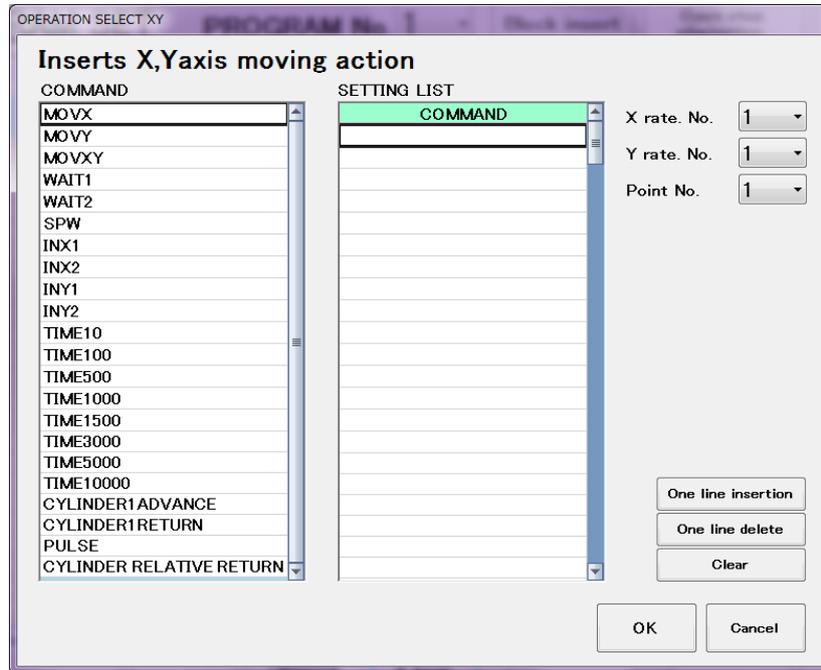
Fig.(4-38): " X,Y axis operation select " screen

[Item]
・X rare. No.   This sets the X axis rated number of the same unit as the setting axis.

・Y rare. No.   This sets the Y axis rated number of the same unit as the setting axis.

・Point No.   This sets the point number where the destination coordinates
                         are registered.

[Button]
・One line insertion   This inserts one empty cell above the selected cell
                         in the setting list column.

・One line delete   This deletes the cell selected by the setting list and fills it up.

・Clear   This clears all contents of the setting list column.。

・O K   This will insert the contents of the setting list column
                         into the program step and return to the program setting screen.

・Cancel   This discards the contents of the setting list field and returns
                         to the program setting.

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[Command]
・MOVX   This will move the X axis motor to the specified point.

・MOVY   This will move the Y axis motor to the specified point.

・MOVXY   This will move the X and Y axis motors to the specified point
at the same time。

・WAIT①,WAIT②   This waits without advancing to the next step
until the WAIT input signal corresponding
to each command is entered.

・SPW   If you enter SPW command for all axis step number,
it becomes usable.
All axes become steps of this command and wait
without proceeding to the next step until the SPW signal is input.

・INX①, INX②   This waits without advancing to the next step
until the INX input signal corresponding
to each command is entered.

・INY①, INY②   This waits without advancing to the next step
until the INY input signal corresponding
to each command is entered.

・TIME10～10000   This command stops the operation for the number of minutes
of the command.
The unit is msec.
It will proceed to the next step after the specified time has elapsed.

・SYLINDER 1 ADVANCE
It can be used when the input signal at the cylinder return end is input.
It outputs a cylinder motion signal and moves the cylinder.
It goes to the next step at the input of the signal at the cylinder working end.

・SYLINDER 1 RETURN
It can be used when an input signal at the cylinder operation end is input.
It outputs a cylinder return signal and moves the cylinder.
It will proceed to the next step at the input of the signal at the cylinder return end.

・PULSE
The operation of the cylinder continues until the end signal is input.
This command is used to protect the cylinder by forcibly turning OFF
when the cylinder operation continues for a certain time.

・SYLINDER RELATIVE RETURN
This command can be used only when using a special driver for positioning.
It will rise at cylinder return to the position of Z axis rated return amount
and move to the next point.

4-5. About reading and writing setting of each setting screen

"Rate, SOC.T, PRE.T, REV.T, REA.T, block, Block control , screw No., cylinder name, X rate,
Y rate, Timer, Program, Unit, tightening data output, option" in the Setting menu,
the setting reading of each setting screen and the setting writing are shown below.
For "Cylinder name, monitoring timer, unit, tightening data output, option" there is
no setting number so selection reading and selection writing of setting can not be done.

4-5-1.Each setting read

You read the settings from a file or a controller.
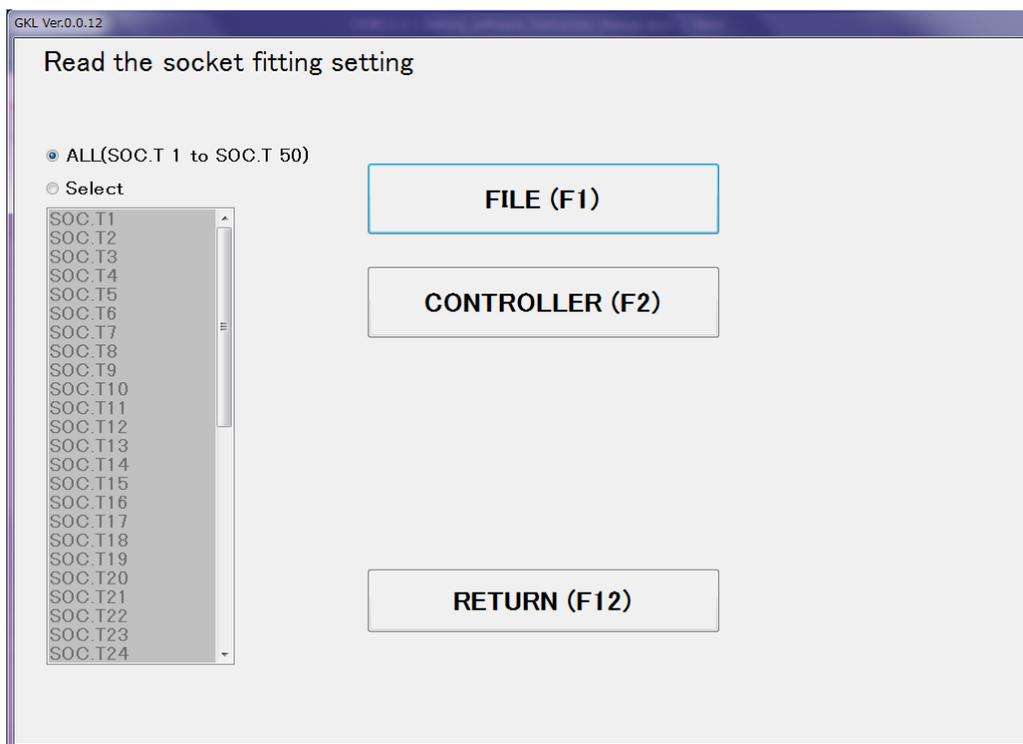
Fig.(4-39):Setting read scren

[Item]
・ALL   This sets all objects to be read.
                                  "Item name ()" varies depending on the setting to be read.

 ・Select   It selects the number of settings to load.
                          By specifying "Select", you can select the list BOX of each setting.
                          In this selective reading, it clicks on an arbitrary number
                           and it becomes selected and the color changes.
                          Multiple numbers can also be selected.

[Button]
・FILE(F1)
It reads each setting from the file.
When "All" is selected, setting of all numbers is read, and when "Selection" is selected,
 only the setting of the number being selected is read from the file of the extension
 of each setting.

・CONTROLLER(F2)
  This loads each setting from the GKL controller.
  When it reads the setting from the GKL controller, it is necessary that the GKL controller
    and the PC are connected with the USB cable.
  A communication error occurs when the controller and PC are not connected.
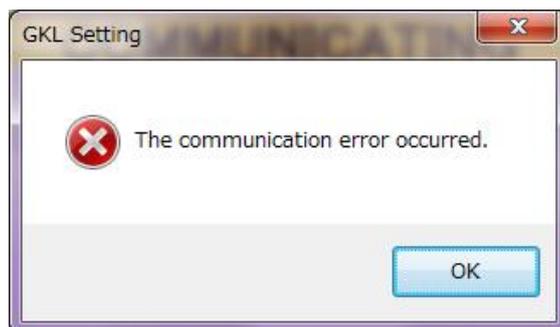
Fig.(4-40):Communication error

・RETURN(F12)   It returns to each setting screen.

①File
In the file processing, HDD (hard disk drive) 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 : GKLT, SOC.T : GKLR, PRE.T : GKLK, REV.T : GKLG, REA.T : GKLH、
Screw No. : GKLJ, Block control : GKLB, Cylinder name : GKLCN,
X rate : GKLXT, Y rate : GKLYTP, Timer setting : GKLST, Unit : GKLU,
Tightening data output : GKLOT, Option : GKLOP

In the selection of reading files, please select the file extension of each setting.
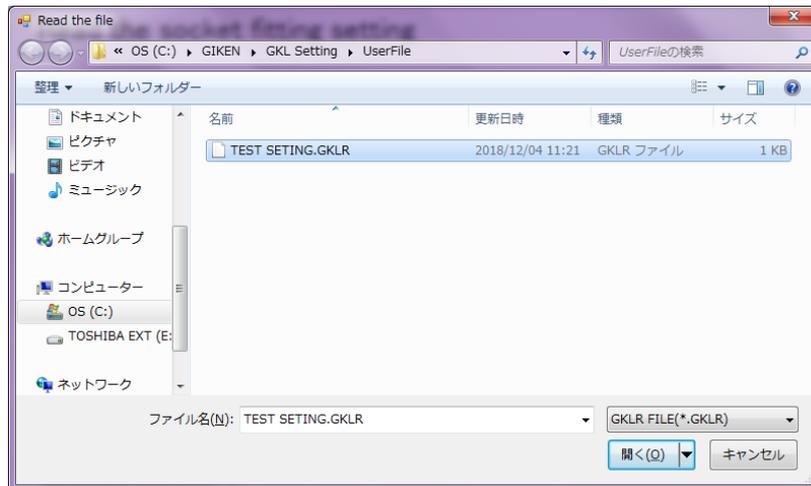
Fig.(4-41): Select reading file

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.
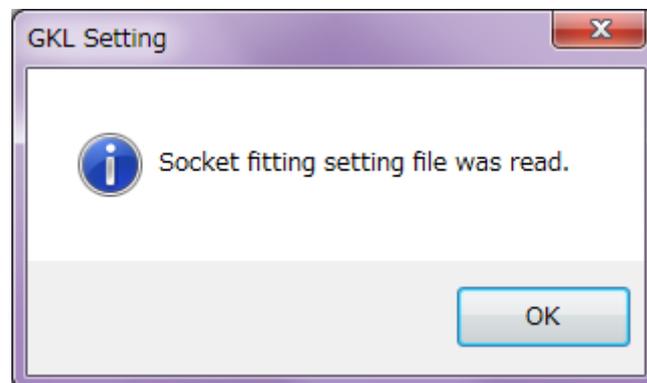
Fig.(4-42): Read complete message

②Controller
  It will read each setting from GKL controller.
  If you read the configuration file from the GKL controller, the controller
   and computer must be connected by a USB cable.
  Communication error occurs when not connected.

Fig.(4-43):Communication error
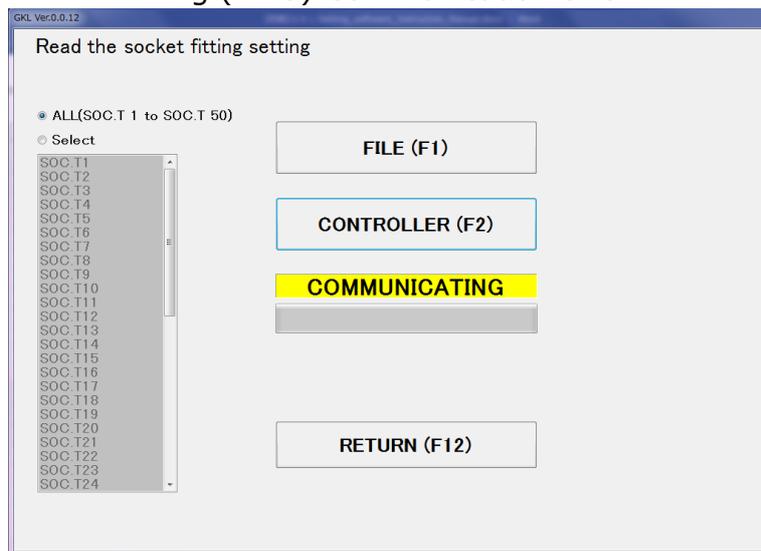
Fig.(4-44): Progress status of controller reading

When the reading from the controller is finished, the following message appears.
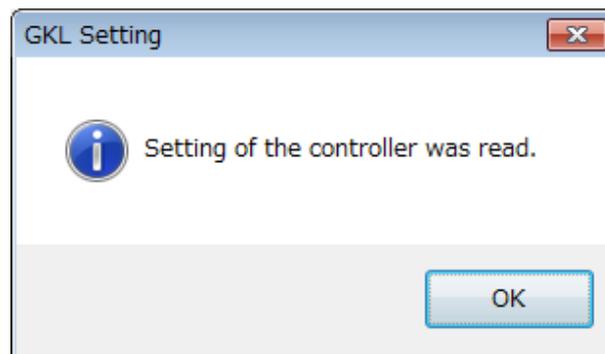
Fig.(4-45): Controller read complete message

③Reading selection of each setting
   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 GKL controller.

※Since there is no set number for cylinder name and timer setting and unit and
   tightening data output and option, you cannot read only the specified settings.
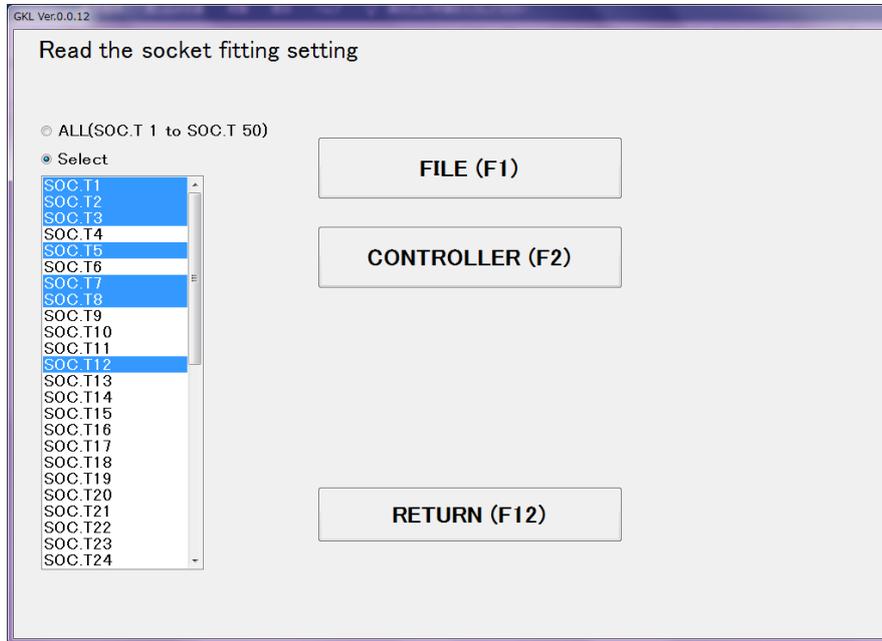
Fig.(4-46): Select setting read

4-5-2.Each setting write

It will write the settings file, or, to the controller.
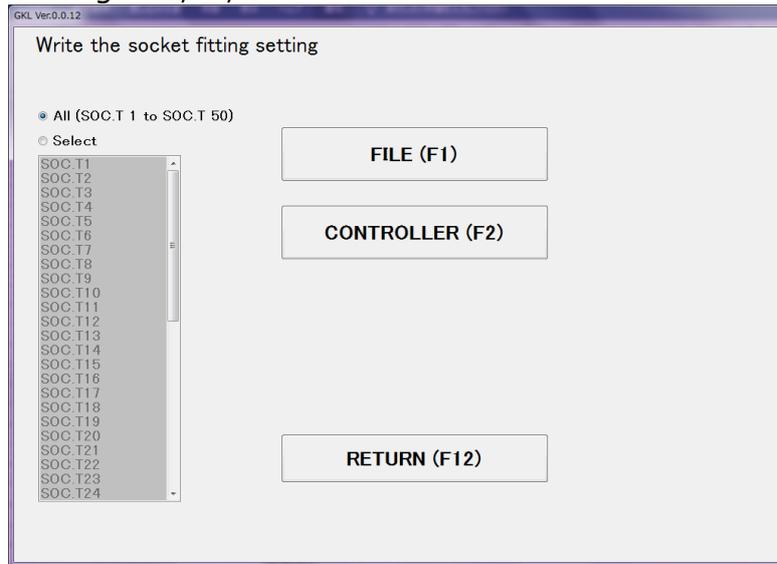
Fig.(4-47): Setting write screen

[Item]
・ALL
It sets all objects to be written.
"Item name ()" depends on the setting to be written.

・Select
It selects the number of the setting to be written.
If you select selection, you can select the list BOX of each setting.
In this selective writing, clicking an arbitrary number changes it as selected
and the color changes.
Multiple numbers can also be selected.

[Button]
・FILE(F1)
It writes the settings from the file.

・CONTROLLER(F2)
It will write each setting from GKL controller.
If you write the configuration file from the GKL controller, the controller
and computer must be connected by a USB cable.
Communication error occurs when not connected.
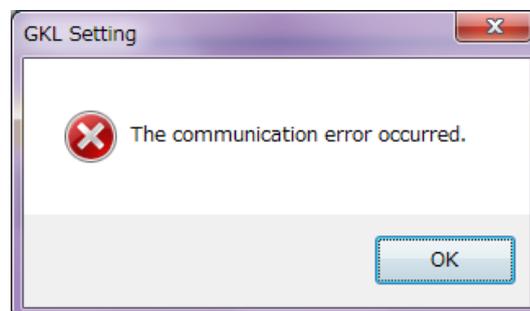
Fig.(4-48):Communication error

・RETURN(F12)
It returns to each setting screen.

①File
In "File", it writes each setting information to HDD (hard disk drive) or other file
  on accessible media.
The setting file that saves each setting information is automatically selected
  in the write dialog.
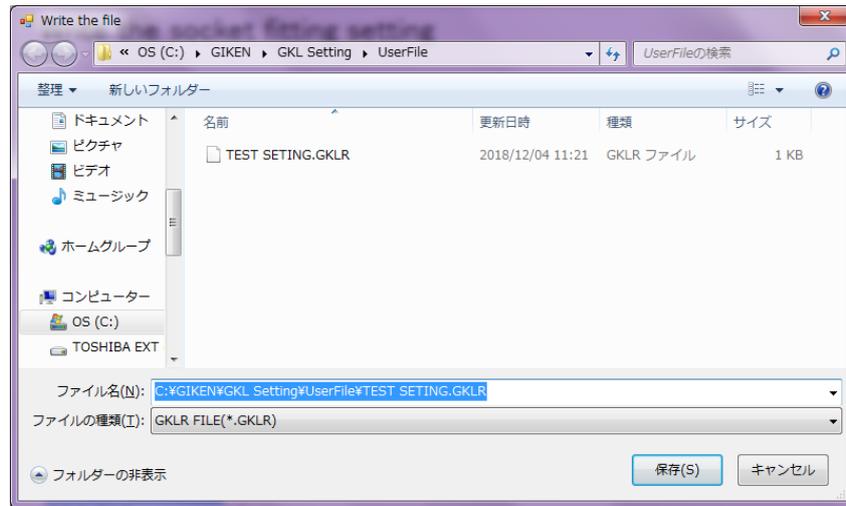
Fig.(4-49): Writing file named

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.
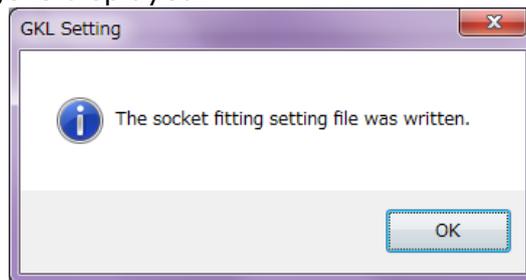
Fig.(4-50):Writing complete message

②Controller
　　It will write each setting from GKL controller.
　　If you write the configuration file from the GKL 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.
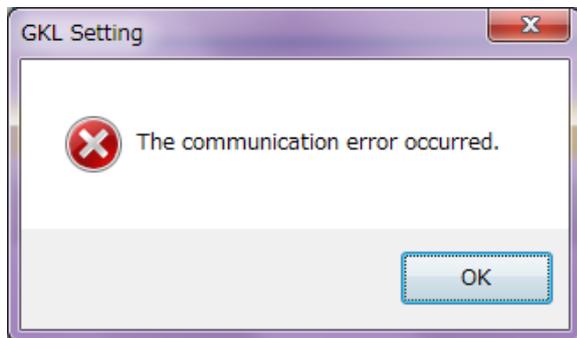
Fig.(4-51):Communication error　　　　　　　　　Fig.(4-52):Password check
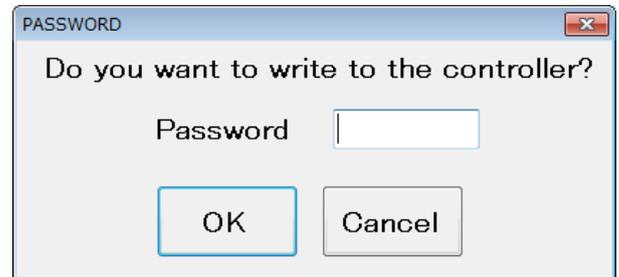
Please turn OFF the operation preparation.
It cannot be written the configuration file when you don't turn OFF the operation ready.
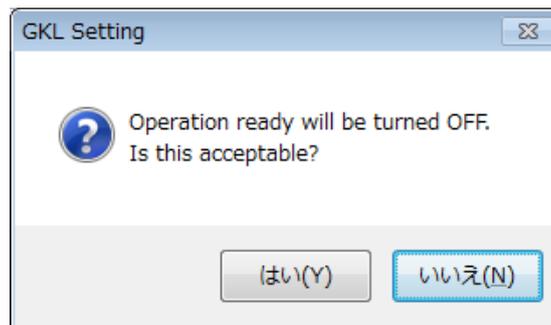
Fig.(4-53):Operation ready OFF confirmation

When writing to the controller is finished, the following message appears.
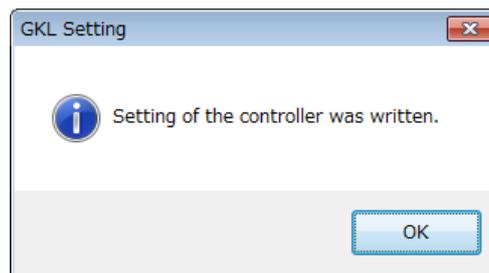
Fig.(4-54):Writing complete message to controller

③Writing selection of each setting
 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 GKL 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.
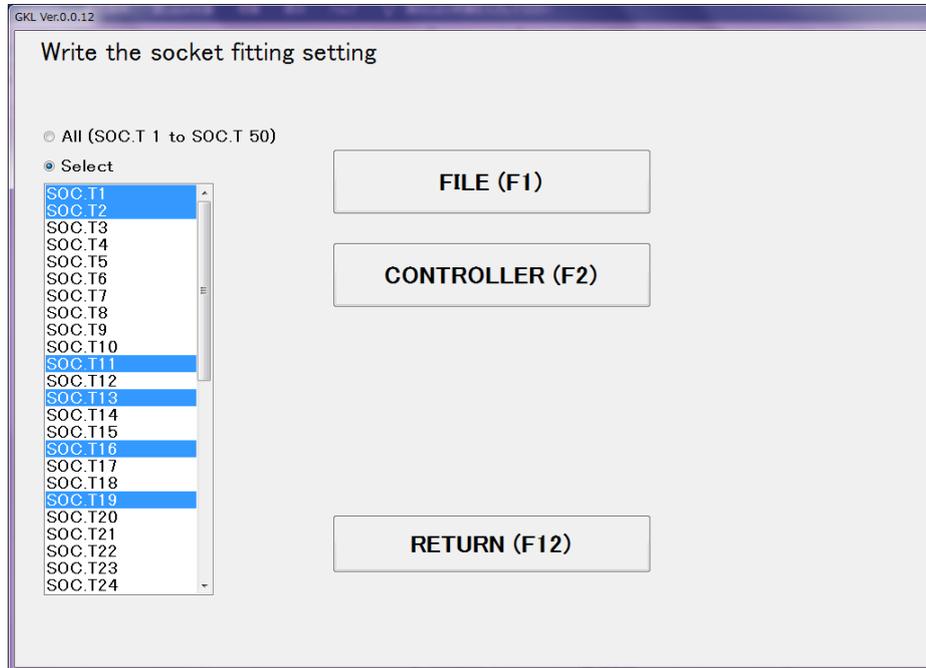
Fig.(4-55): Select setting write

5.Auto measurement

When you select "Auto measurement" from "main menu" the following screen will be displayed.
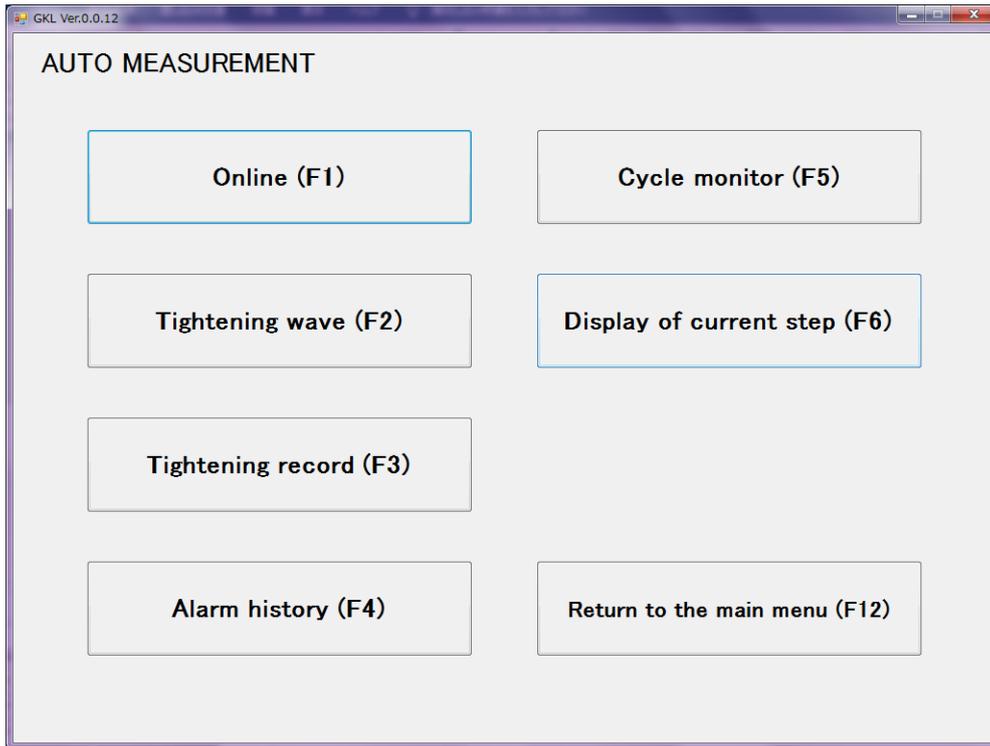
Fig.(5-1):Auto measurement screen

[Button]
・Online(F1)   In this item it is possible to obtain and check
                                          the result data each time the tightening ends.
                                         It can also be saved by selection.

・Tightening wave(F2)   In this item, you can check and save
                                          the tightening waveform of each axis.

・Tightening record(F3)   In this item you can see the record
                                          of the tightening result saved in the controller.

・Alarm history(F4)   In this item you can see the history
                                          of alarms saved in the controller.

・Cycle monitor(F5)   In this item you can monitor the signals
                                          exchanged between the PLC and the controller.

・Display of current step(F6)   In this item, you can check the operation
                                          which is executed by the equipment
                                          from the program table.

・Return to the main menu(F12)   We can return to th main menu.

5-1.Online

When you select "Online" from "Automatic measurement screen", the following screen will appear.
In this item, the tightening result is received from the controller and displayed at the end of block.

Fig.(5-2):Online screen

Fig.(5-3):Communication check

If you want to automatically save the tightening result, please check "Save online to file".
The result saved in this "online" is the result of each operation for 1 tightening.
If duplicate actions are found within the tightening block, the result of the last executed action is saved.

※As an example, if there is a tightening block of "SOC.T 1 → PRE.T 1 → PRE.T 2 → REV.T 1 → REA.T 2 → REA.T 3", the saved result is "SOC.T 1 → PRE.T 2 → REV.T 1 → REA.T 3 ".

※The tightening result of the online item is saved in "C: ¥ GIKEN ¥ GKL setting ¥ automatic measurement ¥ Online".

[Item]
　・Axis No.　　　　　　　　　It displays the axis No. that executed the tightening.

　・ScrewNo.　　　　　　　　　The tightened screw No. is displayed.

　・Date　　　　　　　　　This will display the date at the end of the tightening.

　・Time　　　　　　　　　This displays the time at the end of the tightening.

　・P No.　　　　　　　　　Here, the program No. used for tightening is displayed.

　・U No.　　　　　　　　　The unit number to which the tightened shaft
　　　　　　　　　　　　　　belongs is displayed.

　・Ditermination　　　　　　If this item is OK, ○ is displayed, and if it is NG,
　　　　　　　　　　　　　　NG code is displayed.

　・SOC.T
　　・Torque　　　　　　　　The torque value at the end of "SOC.T" is displayed.
　　　　　　　　　　　　　　The unit is Nm.

　・PRE.T
　　・Fast feed torque
　　　When NR reaches the fastening angle, the maximum torque value
　　　　within the fast feed section is displayed.
　　　The unit is Nm.
　　　If NR does not turn to the fastening angle, 0 Nm will be displayed.

　　・Torque　　　　　　　　The torque value at the end of the
　　　　　　　　　　　　　　PRE.T operation is displayed.
　　　　　　　　　　　　　　The unit is Nm.

　　・Angle　　　　　　　　Here, the angle from the sampling start torque is displayed.

　　・Time　　　　　　　　Here, the time since the PRE.T start is displayed.
　　　　　　　　　　　　　　The unit is 10 msec.

　・REV.T
　　・Torque　　　　　　　　The torque value at the end of
　　　　　　　　　　　　　　the REV.T operation is displayed.
　・REA.T
　　・Torque　　　　　　　　The torque value at the end of
　　　　　　　　　　　　　　the REA.T operation is displayed.
　　　　　　　　　　　　　　The unit is Nm.

　　・Angle　　　　　　　　The angle from the sampling start torque is displayed
　　　　　　　　　　　　　　in the unit of "°".

　　・Time　　　　　　　　The time from the start of REA.T is displayed
　　　　　　　　　　　　　　in units of 10 msec.

　　・Sampling start torque　　The angular measurement starting torque
　　　　　　　　　　　　　　of Rea.T is displayed in the unit "Nm".

　・Work No.　　　　　　　　The classification number to be tightened is displayed
　　　　　　　　　　　　　　when that information is received.

[Button]
　・Return to the Auto measurement menu
　　You can return to the automatic measurement menu.

5-2.Tightening wave

When you select "Tightening waveform" from "Automatic measurement screen"
the following figure is displayed.
In this screen you can display or save the tightening waveform.
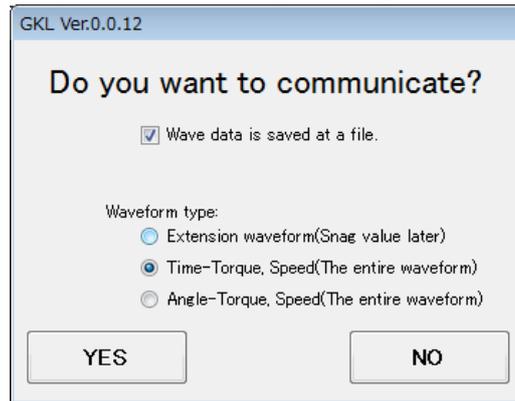
Fig.(5-4):Communication check

The behavior of this item changes with the answer
to the first "do you want to communicate?"

In case of "Yes"
Automatically displays the tightening waveform ("time – torque and speed",
"angle – torque and speed", elongation waveform) each time the tightening block ends.
Switching the display axes is done by selecting the axis No. at the top of the screen.
When "Save waveform data" is selected, the waveform information is
automatically saved in a file.

In case of "No"
If you select "No", you can manually read the tightening waveform
("time – torque and speed", "angle – torque and speed", elongation waveform)
from the controller.
The loaded waveform data can be saved to a file manually.
In addition, you can read the saved waveform data file and display the waveform.

※The file of tightening waveform information is saved
in "C: ￥ GIKEN ￥ GKL setting ￥ automatic measurement ￥ waveform".
.

In case of checking automatic saving of tightening waveform

It is necessary to set the OK range for each program displayed as a waveform.
※The part specified in the OK range is surrounded by a red frame in the graph.
　　When setting the OK range is completed, it operates
　　　in the automatic display mode and communicates with the controller.
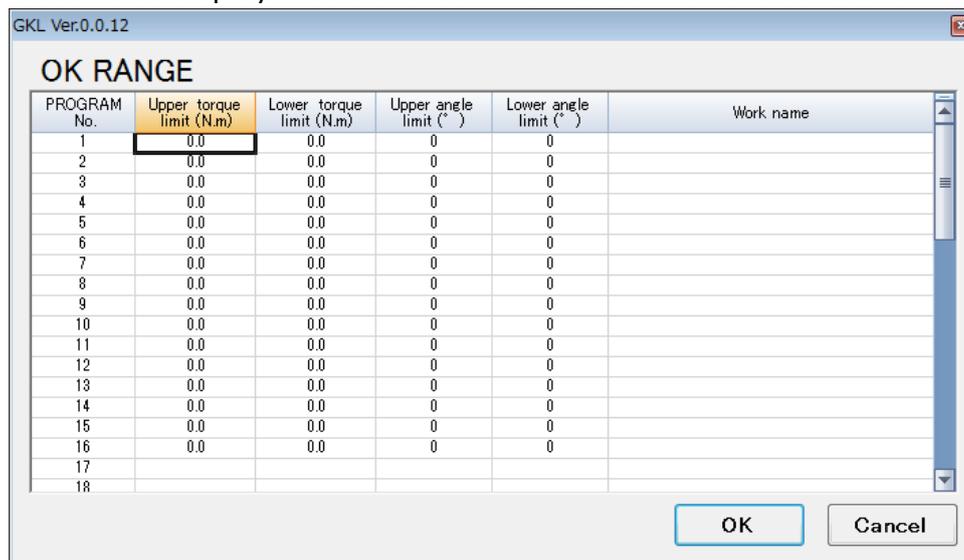
Fig.(5-5): Set OK range

[Item]
・PROGRAM No.　　　　　　　　This indicates the program number for setting "OK range".

・Upper torque limit　　　　　　This sets the upper torque limit of the OK range.

・Lower torque limit　　　　　　This sets the lower torque limit of the OK range.

・Upper angle limit　　　　　　This sets the upper angle limit of the OK range.

・Lower angle limi　　　　　　　This sets the lower angle limit of the OK range.

・Work name　　　　　　　　　You can fill in the work name and notes.

[Button]
・OK　　　　　　　　　　　　　It saves the settings and moves
　　　　　　　　　　　　　　　　to the auto collection screen.

・Cancel　　　　　　　　　　　This will move to the automatic collection screen
　　　　　　　　　　　　　　　　without setting it.
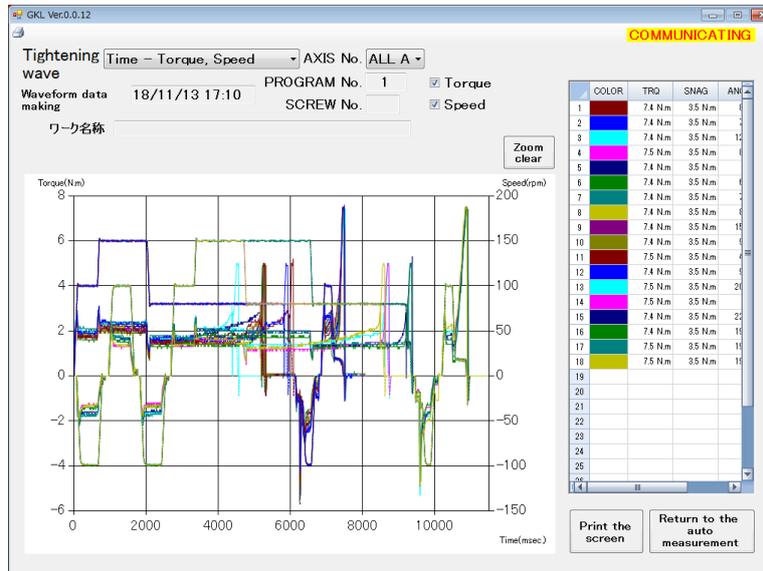
Fig.(5-6): Automatic waveform acquisition mode

[Item]
- (Wave type※)　　　　　　It is fixed to the waveform of preselected type.
　　　　　　　　　　　　　　※This item name is not listed on the screen.

- AXIS　Ｎｏ.　　　　　　This selects the axis number for displaying the waveform.
　　　　　　　　　　　　　When "All axes" is selected, graphs of all axes overlap
　　　　　　　　　　　　　 and they are displayed.
　　　　　　　　　　　　　Also, if you select each axis number,
　　　　　　　　　　　　　 a graph of each axis will be displayed.

- Waveform data making　　It displays the date and time
　　　　　　　　　　　　　　when the tightening waveform information was acquired.

- PROGRAM　Ｎｏ.　　　　The program No. that acquired
　　　　　　　　　　　　　　the tightening waveform information is displayed.

- SCREW　Ｎｏ.　　　　　This shows the screw number from
　　　　　　　　　　　　　 which the tightening waveform information was acquired.

- Work name　　　　　　　This item displays the work name and attention etc.
　　　　　　　　　　　　　　indicated at setting the "OK range".

- （Detailed data display※）　It is located on the right side of the screen and
　　　　　　　　　　　　　　displays the following values for each screw number.

　- COLOR　　　　　　　　The waveform of the corresponding screw number
　　　　　　　　　　　　　 is displayed in this color.

　- TRQ　　　　　　　　　This will display the result torque.

　- SNAG　　　　　　　　This shows the resulting snug torque (sampling start torque).

　- ANGLE　　　　　　　　This displays the result angle.

　- Total ditermnation　　　This judgment result of 1 tightening will be displayed.

- Graph　　　　　　　　　It displays a graph corresponding
　　　　　　　　　　　　　 to each axis (color of detailed data).
　　　　　　　　　　　　　The speed waveform is indicated by the dotted line,
　　　　　　　　　　　　　 and the torque waveform is indicated by the solid line.

[Button]
・Checkbox
　・Torque　　　　　　　　　　When this is checked, the torque waveform is displayed
　　　　　　　　　　　　　　　in the graph area.

　・Speed　　　　　　　　　　When this is checked, the speed waveform is displayed
　　　　　　　　　　　　　　　in the graph area.

・Zoom clear　　　　　　　　This button returns the graph enlarged with the mouse
　　　　　　　　　　　　　　　to the original graph.

・Print the screen　　　　　This button prints the currently displayed screen.

・Return to the Auto measurement menu
　You can return to the automatic measurement menu.

Print the screen :　　This button prints the currently displayed screen.

In case of tightening waveform manual save mode (When "No" is selected)
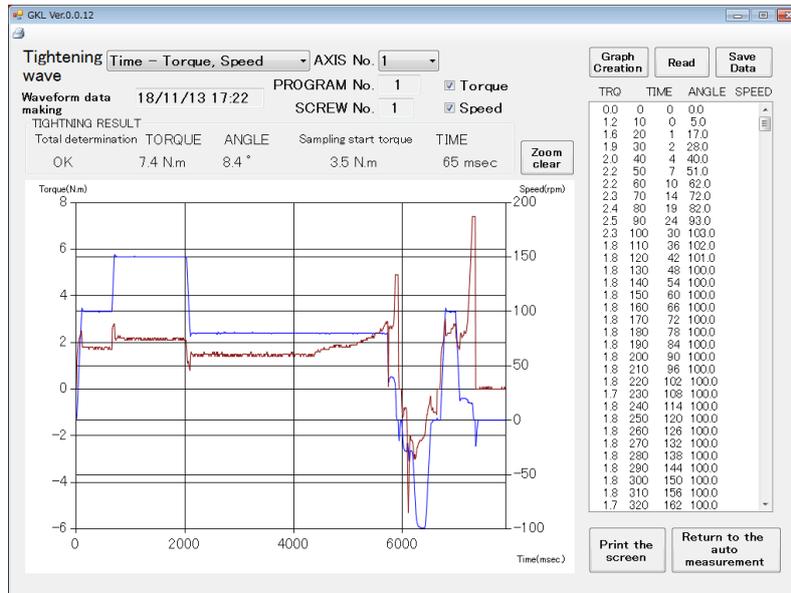
Fig.(5-6): Tightening waveform screen

※The red line shows the torque graph and the blue line shows the speed graph.
　Dragging the graph will enlarge the range.

　・(Wave type※)　　　　　In this item, you select the type of tightening waveform
　　　　　　　　　　　　　to be displayed on the graph from three types
　　　　　　　　　　　　　(time - torque and speed, angle - torque and speed,
　　　　　　　　　　　　　extension waveform)
　　　　　　　　　　　　　※This item name is not listed on the screen.
[Item]
　・AXIS　Ｎ o .　　　　　This selects the axis number for displaying the waveform.

　・Waveform data making
　　It displays the date and time when the tightening waveform information was acquired.

　・PROGRAM　Ｎ o .　　　The program No. that acquired
　　　　　　　　　　　　　the tightening waveform information is displayed.

　・SCREW　Ｎ o .　　　　This shows the screw number from
　　　　　　　　　　　　　which the tightening waveform information was acquired.

　・TIGHTENING RESULT
　　・Total ditermnation　　This judgment result of 1 tightening will be displayed.

　　・TORQUE　　　　　　　If the final operation is REA.T or PRE.T,
　　　　　　　　　　　　　the final torque value is displayed in the unit Nm.
　　　　　　　　　　　　For other operations, 0 is displayed.

　　・ANGLE　　　　　　　When the final motion is REA.T or PRE.T,
　　　　　　　　　　　　　the angle from the sampling start torque is displayed in °.
　　　　　　　　　　　　For other operations, 0 is displayed.

　　・Sampling start torque
　　　　When the final operation is REA.T or PRE.T,
　　　　 the angle measurement start torque value is displayed.
　　　For other operations, 0 is displayed.

　　・TIME　　　　　　　　When the final motion is REA.T or PRE.T,
　　　　　　　　　　　　　the angle from the sampling start torque is displayed.
　　　　　　　　　　　　For other operations, 0 is displayed.

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・（Detailed data display※）　　It is located on the right side of the screen and
　　　　　　　　　　　　　　　　 displays the following values for each item.
　　　　　　　　　　　　　　　 By selecting the data in the table with the mouse
　　　　　　　　　　　　　　　　 and pressing the graph creation button,
　　　　　　　　　　　　　　　　 you can create a waveform in an arbitrary data range.

　　・TRQ　　　　　　　　　　 The torque value acquired for each sampling from the start
　　　　　　　　　　　　　　　　 of tightening is displayed.

　　・TIME　　　　　　　　　　 This shows the time when sampling was started
　　　　　　　　　　　　　　　　 from the start of tightening to the end.

　　・ANGLE　　　　　　　　　 The angle value acquired for each sampling from the start
　　　　　　　　　　　　　　　　 of tightening is displayed.

　　・SPEED　　　　　　　　　 The speed value acquired for each sampling from the start
　　　　　　　　　　　　　　　　 of tightening is displayed.
　　　　　　　　　　　　　　　 (This unit is "rpm".)

　　・Graph　　　　　　　　　 It displays a graph corresponding to the axis.
　　　　　　　　　　　　　　　　 (This axis number is selected in the "axis number" item.)

　　[Button]
　・Checkbox
　　・Torque　　　　　　　　　 When this is checked, the torque waveform is displayed
　　　　　　　　　　　　　　　 in the graph area.

　　・Speed　　　　　　　　　 When this is checked, the speed waveform is displayed
　　　　　　　　　　　　　　　 in the graph area.

　・Zoom clear　　　　　　　　 This button returns the graph enlarged with the mouse
　　　　　　　　　　　　　　　　 to the original graph.

　・Graph creation　　　　　　 This creates a waveform from the information being selected
　　　　　　　　　　　　　　　　 from the detailed data list.

　・READ　　　　　　　　　　 Specified axis No. Read the waveform data from the controller.
　　　　　　　　　　　　　　　　 It also reads the waveform data from the saved file.

　・Save data　　　　　　　　 This saves the waveform data read from GKL in a file.

　・Print the screen　　　　　 This button prints the currently displayed screen.

　・Return to the Auto measurement menu
　　 You can return to the automatic measurement menu.

　🖨 Print the screen :　　This button prints the currently displayed screen.

5-3.Tightening record

When you select "tightening history" from "automatic measurement menu",
 it will change to the screen shown below.
In this case, you can acquire and display the tightening record information
 from the controller.
In this screen you can also save the displayed tightening history in a file.

Fig.(5-8):Tightening record

[Item]
　・SCREW No. 　　　　　It displays the screw number.

　・Date 　　　　　　　It displays the date when the tightening
　　　　　　　　　　　　　of the target data was completed.

　・Time 　　　　　　　It displays the hour and minute when the tightening
　　　　　　　　　　　　　of the target data is completed.

　・P.No. 　　　　　　It displays the program No. used for the target data.

　・U.No. 　　　　　　It displays the unit number of the target data.

　・TQ 　　　　　　　It displays the torque result of the target data. (Unit: Nm)

　・Angle 　　　　　　It displays the angular result of the final action
　　　　　　　　　　　　of the target data. (Unit: °)

　・Time 　　　　　　It displays the time result of the target data.
　　　　　　　　　　　For this time result the thing of the final operation is used.
　　　　　　　　　　　　(Unit: msec)

　　　　　　　　　　※If the final operation is PRE.T, REA.T, it is the same
　　　　　　　　　　　　as the value of online temporary tightening and final tightening.

　・Snag 　　　　　　It displays angle measurement start torque value.

・Determination   When the judgment is OK, ○ is displayed.
                              And when it is NG, the NG code is displayed.

・NG Processing   It shows whether there was NG processing by QL input.
                              If there is QL processing, it displays "presence ".
                              Others it displays "absence "

※When using the positioning mode, it is not saved in the tightening record regardless
   of whether QL processing is performed or not.

・DATA No.   It displays the engine number of the workpiece
                              that was tightened.

※The order of the data is obtained from the controller and rearranged
   in the order of date, time and screw number.

[Button]
・AXIS No..   You select axis numbers to read from all axes and each axis.

・READ   It will read the tightening record of the selected axis number.

・CANCEL   You can cancel reading by pressing during loading.

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

・Record write   It saves the displayed tightening record in a CSV format file.

・Return to the Auto measurement menu
   You can return to the automatic measurement menu.

5-4.Alarm history

When you select "Alarm history" from "Automatic measurement",
the following screen will appear.
You can acquire alarm history information from the controller
and save the displayed alarm history to a file.
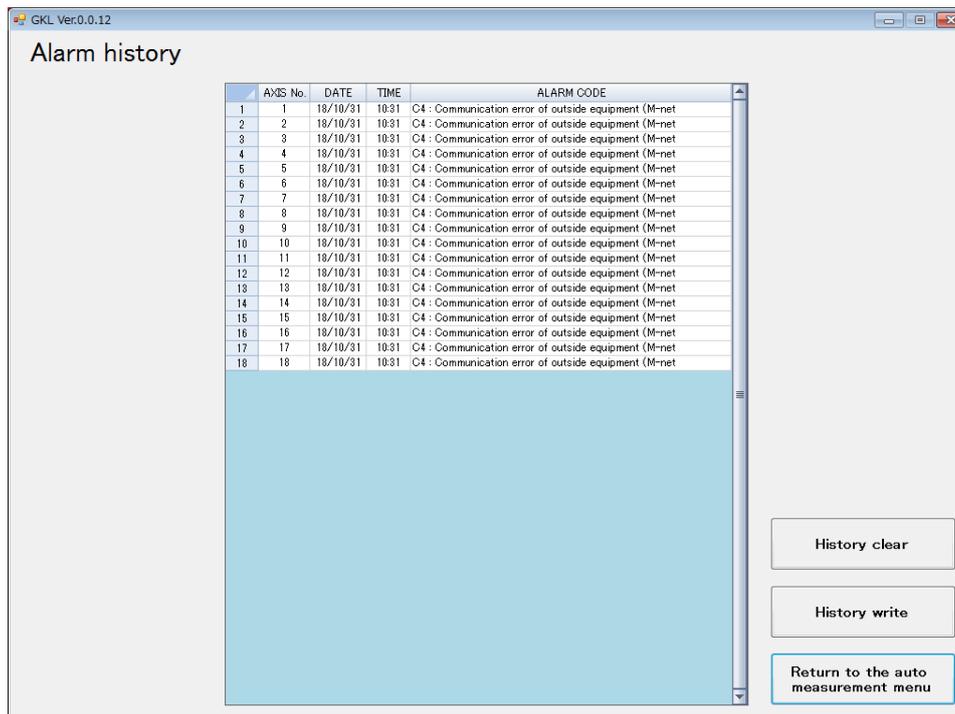
Fig.(5-9):Alarm history

[Item]
・Axis No.   The axis number where the alarm occurred is displayed.

・Date   It displays the year, month, and day when the alarm occurred.

・Time   It displays the time when the alarm occurred.

・Alarm code   The alarm code and contents of the occurred alarm
                                   are displayed.

[Button]
・History clear   It clears the alarm history saved in the controller.

・History write   It saves the displayed alarm history in a CSV format file.

・Return to the auto measurement menu
   You can return to the automatic measurement menu.

5-5.Cycle monitor

You will see this screen when you select "Cycle monitor"
from "Automatic measurement".
This function shows the operation status of the input / output signal the controller is
exchanging with PLC etc.
Also, you can save the displayed data.
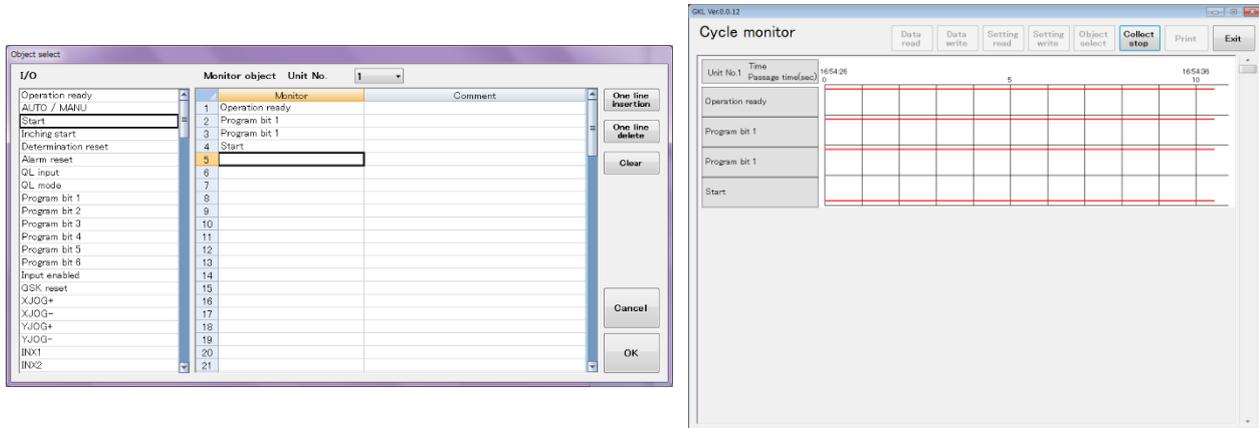
Fig.(5-10):Cycle monitor

[Button]
・Data read It reads previously collected signal and its waveform from the file.

・Data write It saves the information of the displayed signal in a file.

・Setting read It reads the previously selected signal from the file.

・Setting write It selects signals to collect data and it saves the list to a file.

・Object select On the left screen of Figure 5-9, you select the name
of the signal that you want to get data.

・Collect start It takes the waveform of the selected signal.
※It is the waveform after pressing the button.

・Print This prints the current screen.

・Exit It will exit this screen and return
to the automatic measurement menu.

5-6.Display of current step

You select "Display current step" from "Automatic measurement menu".
If you select it, you will be asked whether you want to read the program information
 in the controller.
If you select "Yes", the program information that the controller has is displayed
 as shown below.
This screen shows the executing step of the running program.

Fig.(5-11):Display of current step

[Table]
　・Unit　　　　　　　　　　It displays each unit number.

　・Program No.　　　　The program number entered for each unit number is displayed.

[Item]
　・Program No.　　　　The program number currently recognized by the controller
　　　　　　　　　　　　is displayed.

　・Step display　　　　The currently executing step is displayed in yellow as shown
　　　　　　　　　　　　in Fig. 5-11-2.

[Button]
　・Return　　　　　　　You can return to the automatic measurement menu.

6.Quality control

When you select "Quality Control" from "Main Menu", it will be the following screen.
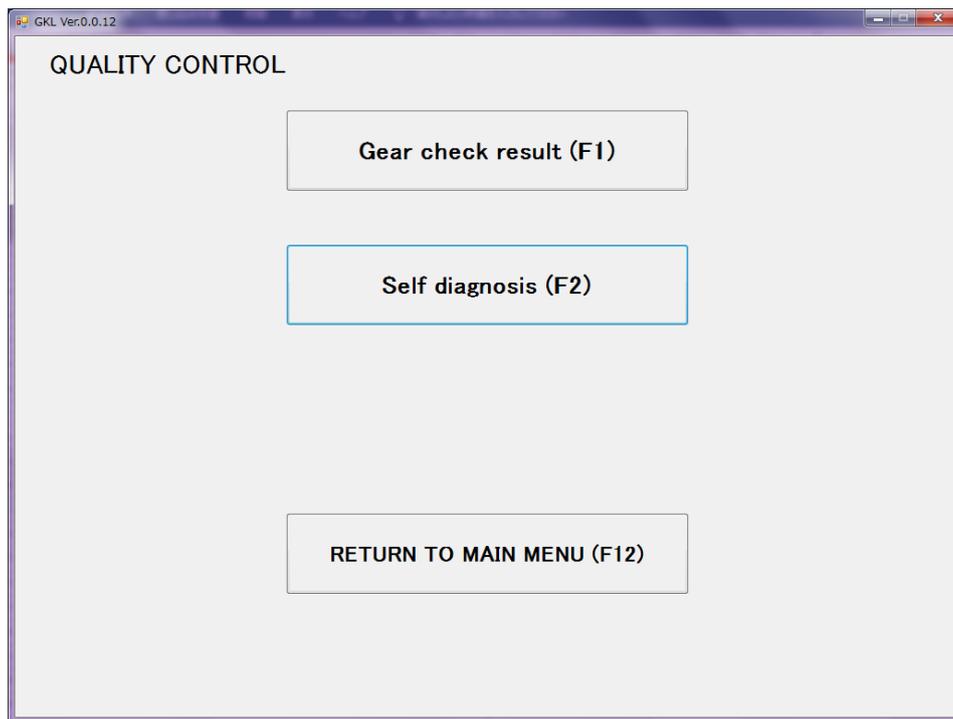
Fig.(6-1): Quality control menu

[Button]

・Gear check result(F1)　　　We are planning to display the results of the gear check, but we can not use it now.

・Self diagnosis(F2)　　　　This shows the version of PC, IF unit, controller, display. It checks whether the controller versions are all the same.

・Return to the main menu (F12)　　You can return to the main menu.

6-1.Gear check result

When you select "Gear check result" on "Quality control menu" screen,
this screen will be displayed.

Fig.(6-2): Gear check result

[Button]
・Return to the Quality control menu　　You can return to the "Quality control menu".

　※Please note that this screen is not currently available.

6-2.Self diagnosis

When you select "Self-diagnosis" from "Quality control menu",
 it becomes the following screen.
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.
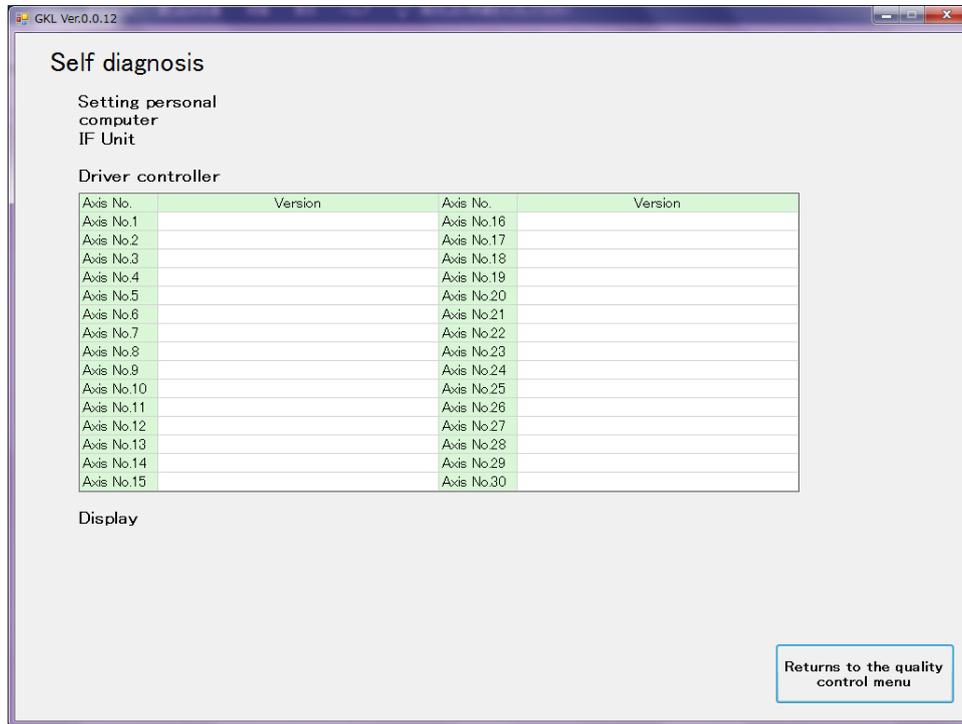
Fig.(6-3): Self diagnosis

[Item]
・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.

                      ※If it does not match the driver version of the GKL.ini file,
                           "ROM Ver error" is displayed.

・Display   It shows the version of the display.

[Button]
・Return to the Quality control menu   You can return to the "Quality control menu".

7.Print/Excel output

If you select "Print / Excel output" from "Main Menu", the following screen will be displayed.
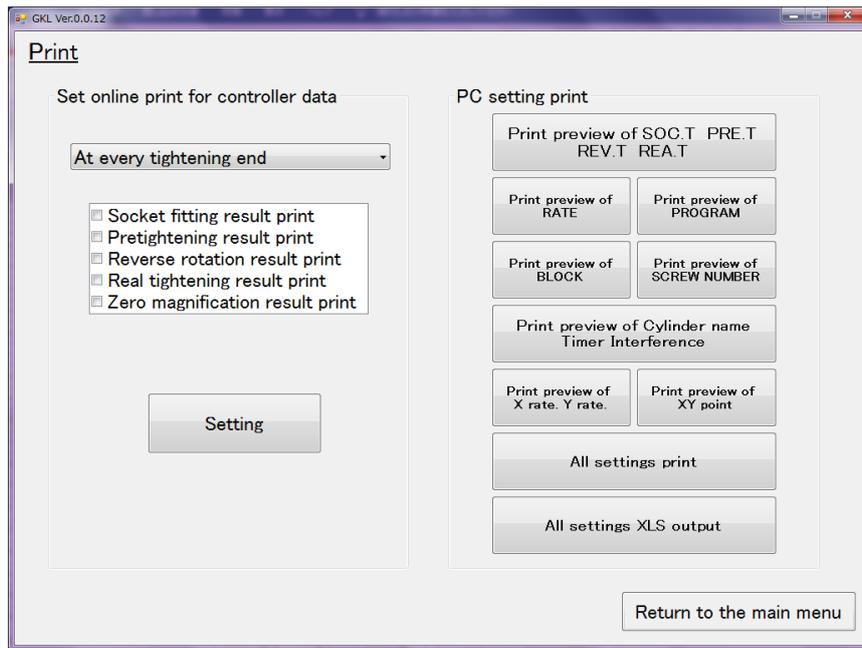
Fig.(7-1):Print display

In "Print / Excel output", you can perform the print setting to use the printer.
Also you can print and convert to Excel file of each setting.
In "ONLine printing", it is necessary to connect the printer to the interface,
 and in "PC setting printing", the setting PC and the interface must be connected.

[Item]
・Perform online print setting of controller data
   We will select the timing to send the tightening result to the printer connected
    to the interface and the tightening operation to send the result.

・PC setting print
   It prints data of each setting and converts the print data to Excel file.

[Button]
・Return to the main menu   You can return to the main menu.

7-1. Perform online print setting of controller data

Here, we will set the printing of the tightening result.
In order to use this function, the printer must be connected to the interface.

・Print mode select   It sets the timing of the automatic printing
                                         in the print mode selection.
                                  Please select from the following items.

・No automatic print   Automatic printing is not performed.

・Every tightening end time   Each tightening result is printed each time tightening ends.

・NG occurrence   The tightening result is printed only when NG occurs.

・First N set + Data when NG occurrence
  Each time the equipment is started up and set, every time the tightening ends,
   only when printing of the set number of copies ends, it prints only when NG occurs.

※If you select anything other than "No automatic print", select the printing operation.
   For this selection, you select from the following items.

 ・Socket fitting result print
 ・Pretightening result print
 ・Reverse rotation result print
 ・Real tightening result print
 ・Zero magnification result print

※When " First N set + Data when NG occurrence " is selected, set the first number.
※When "No automatic print" is selected, result print selection and
   initial number setting are not displayed.

After selecting the printing operation, press the "Setting" button, the setting
 of the selected printing is written to the controller.

7-2.PC setting print

・Print preview of SOC.T PRE.T REV.T REA.T
  It displays the print preview screen of SOC.T, PRE.T, REV.T, and REA.T currently held
    on the setting software.
  Pressing the "Print" button on this preview screen prints each motion setting.

・Print preview of RATE
  It displays the print preview screen of "Rate setting" currently held
    on the setting software.

・Print preview of PROGRAM
  It displays the print preview screen of "Program setting" currently held
    on the setting software.

・Print preview of BLOCK
  It displays a print preview screen 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.

8.I/O monitor

When you select "Monitor" from "I / O monitor menu", the following screen will appear.
In this screen, the controller monitors signals exchanged with the PLC etc.
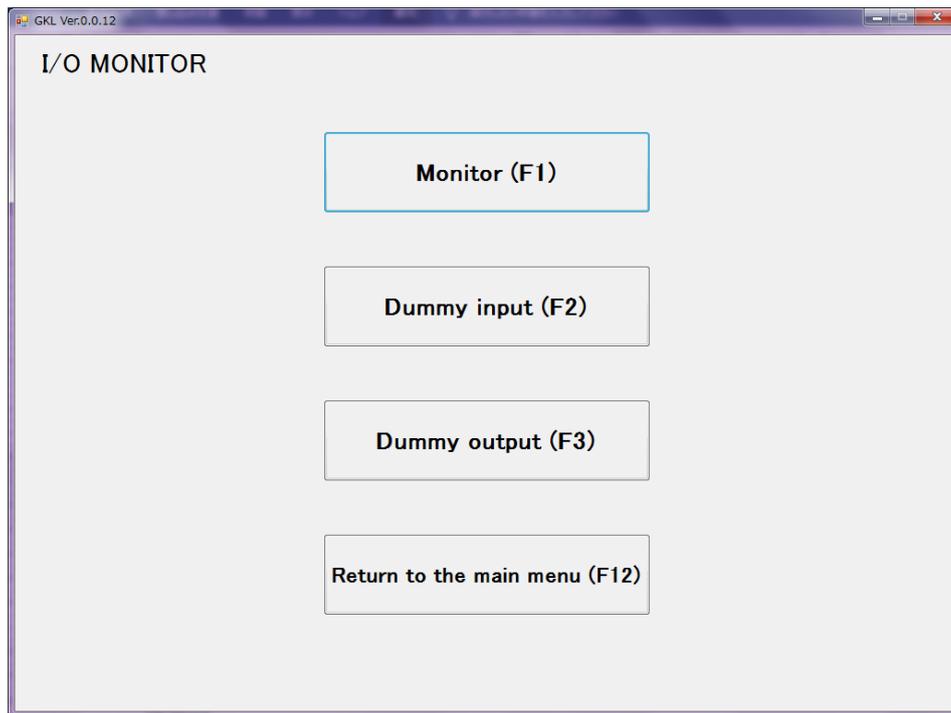
Fig.(8-1): I/O monitor menu

[Button]
- 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)   You can return to the main menu.

8-1.Monitor

When you select "Monitor" from "I / O monitor menu", the following screen will appear.
In this screen, the controller monitors signals exchanged with the PLC etc.
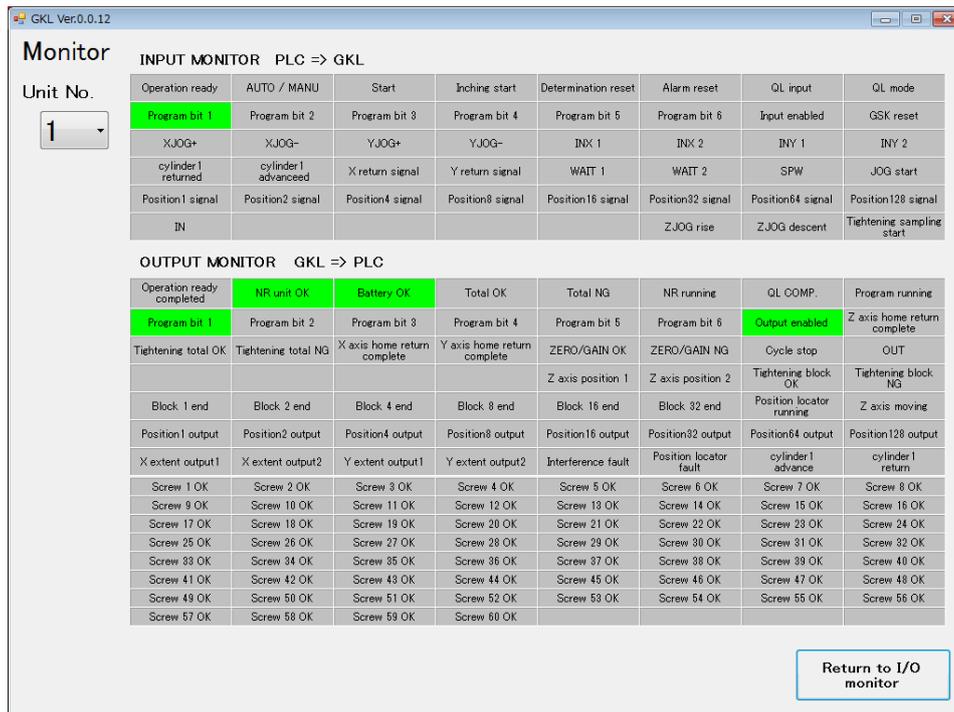
Fig.(8-2): Monitor screen

[Item]
・Unit No.   It selects the unit number to display.

・INPUT MONITOR   Displays the input signal of the controller.
                                  Normally, a list is displayed, and
                                  when the input signal enters from the outside,
                                  the column of the input signal glows green.

・OUTPUT MONITOR   The output signal of the controller is displayed.
                                  Normally, a list is displayed, and when the GKL outputs
                                  a signal, the output signal field glows green.
[Button]
・Return to I/O monitor   You can return to the I/O monitor menu.

8-2.Dummy input

When you select "Force input" from "I / O monitor", the following screen will appear.
Unlike the "monitor" screen, you can select and input the input signal from the outside.
Like "Monitor" screen, "Output monitor" lights the column of the signal
  which is output by GKL in green.

It changes to green when input signal is selected.
Multiple input signals can be selected at the same time,
  and the selected signal is simultaneously input to GKL.
By pressing the "execute" button at the bottom of the screen, the signal is input to GKL.

※Unlike the "monitor" screen, please note that it will not be entered
    until the execute button is pressed.

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Dummy input   **Unit No.** [1 ▾]

DUMMY INPUT   PLC => GKL

Operation ready	AUTO / MANU	Start	Inching start	Determination reset	Alarm reset	QL input	QL mode
Program bit 1	Program bit 2	Program bit 3	Program bit 4	Program bit 5	Program bit 6	Input enabled	GSK reset
XJOG+	XJOG-	YJOG+	YJOG-	INX 1	INX 2	INY 1	INY 2
cylinder1 returned	cylinder1 advanced	X return signal	Y return signal	WAIT 1	WAIT 2	SPW	JOG start
Position1 signal	Position2 signal	Position4 signal	Position8 signal	Position16 signal	Position32 signal	Position64 signal	Position128 signal
IN					ZJOG rise	ZJOG descent	Tightening sampling start

OUTPUT MONITOR   GKL => PLC

Operation ready completed	NR unit OK	Battery OK	Total OK	Total NG	NR running	QL COMP.	Program running
Program bit 1	Program bit 2	Program bit 3	Program bit 4	Program bit 5	Program bit 6	Output enabled	Z axis home return complete
Tightening total OK	Tightening total NG	X axis home return complete	Y axis home return complete	ZERO/GAIN OK	ZERO/GAIN NG	Cycle stop	OUT
				Z axis position 1	Z axis position 2	Tightening block OK	Tightening block NG
Block 1 end	Block 2 end	Block 4 end	Block 8 end	Block 16 end	Block 32 end	Position locator running	Z axis moving
Position1 output	Position2 output	Position4 output	Position8 output	Position16 output	Position32 output	Position64 output	Position128 output
X extent output1	X extent output2	Y extent output1	Y extent output2	Interference fault	Position locator fault	cylinder1 advance	cylinder1 return
Screw 1 OK	Screw 2 OK	Screw 3 OK	Screw 4 OK	Screw 5 OK	Screw 6 OK	Screw 7 OK	Screw 8 OK
Screw 9 OK	Screw 10 OK	Screw 11 OK	Screw 12 OK	Screw 13 OK	Screw 14 OK	Screw 15 OK	Screw 16 OK
Screw 17 OK	Screw 18 OK	Screw 19 OK	Screw 20 OK	Screw 21 OK	Screw 22 OK	Screw 23 OK	Screw 24 OK
Screw 25 OK	Screw 26 OK	Screw 27 OK	Screw 28 OK	Screw 29 OK	Screw 30 OK	Screw 31 OK	Screw 32 OK
Screw 33 OK	Screw 34 OK	Screw 35 OK	Screw 36 OK	Screw 37 OK	Screw 38 OK	Screw 39 OK	Screw 40 OK
Screw 41 OK	Screw 42 OK	Screw 43 OK	Screw 44 OK	Screw 45 OK	Screw 46 OK	Screw 47 OK	Screw 48 OK
Screw 49 OK	Screw 50 OK	Screw 51 OK	Screw 52 OK	Screw 53 OK	Screw 54 OK	Screw 55 OK	Screw 56 OK
Screw 57 OK	Screw 58 OK	Screw 59 OK	Screw 60 OK				

[Run] [Cancel] [Return to I/O monitor]

Fig.(8-3): Dummy input screen

[Item]
　・Unit No.　　　　　　　　　　It selects the unit number to display.

　・DUMMY INPUT　　　　　　　The input signal of the controller is displayed.
　　　　　　　　　　　　　　　 Normally, the list is displayed, and select the signal
　　　　　　　　　　　　　　　 to be input to GKL from this list.
　　　　　　　　　　　　　　　 The column of the selected signal glows green

　・OUTPUT MONITOR　　　　　 The output signal of the controller is displayed.
　　　　　　　　　　　　　　　 Normally, a list is displayed, and when the GKL outputs
　　　　　　　　　　　　　　　 a signal, the output signal field glows green.

[Button]
　・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　　　　 You can return to the I/O monitor menu.

8-3.Dummy output

When you select "Dummy output" from "I / O monitor", it will be the following screen.
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, and press the Run button.
The controller forcibly outputs the signal selected at that time to the outside
  with SIO communication.
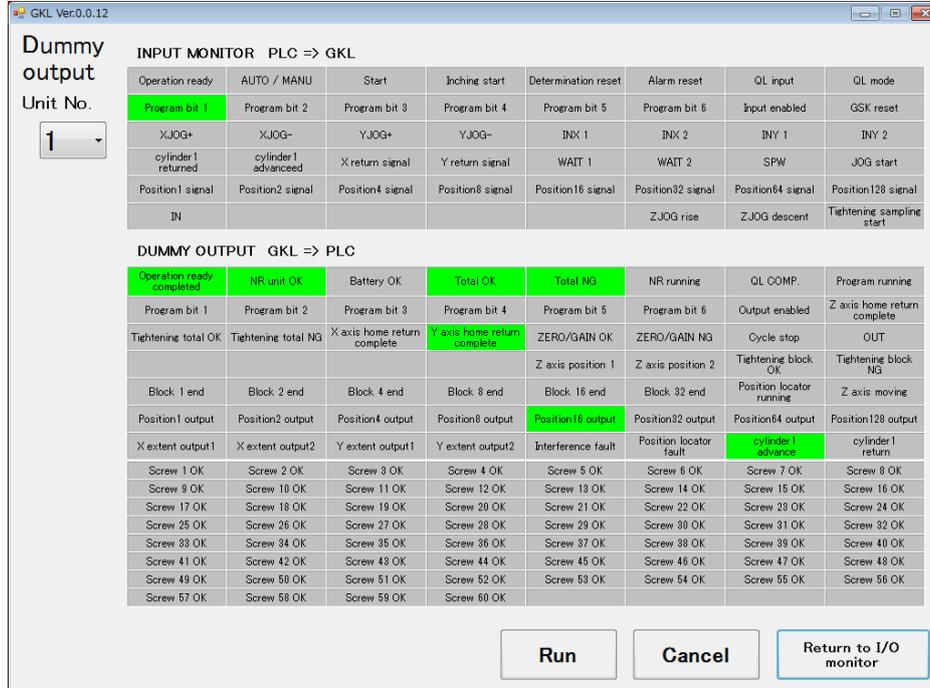
Fig.(8-4): Dummy output screen

[Item]
・Unit No.   It selects the unit number to display.

・Input monitor   Displays the input signal of the controller.
                              Normally, a list is displayed, and
                               when the input signal enters from the outside,
                               the column of the input signal glows green.

・Dummy output   The output signal of the controller is displayed.
                               Normally, the list is displayed, and select the signal
                               to be output to PLC etc. from this list.
                               The column of the selected signal glows green.

[Button]
・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   You can return to the I/O monitor menu.

9.Other
9-1.About USB driver
In order to connect the GKL controller and the setting PC with the USB cable,
 it is necessary to make the setting personal computer recognize the GKL controller.
Therefore, you need to install the specified USB driver.
Please install by executing things with OS of 32 bits ⇒ "VCP_V1.3.1_Setup.exe".
Please install by executing things with OS of 64 bit ⇒ "VCP_V1.3.1_Setup_x64.exe".

9-2. Regarding controller and setting PC connection

・Please set the COM port number used for communication with the controller
 to "GSS_Com =" in "C ¥ GIKEN ¥ GKL setting ¥ GKL.ini".

・Please set the version of the controller that communicates with the setting PC
 to "ChkIFUnitVersionSingle =" or "ChkIFUnitVersionDouble ="
 in "C ¥ GIKEN ¥ GKL setting ¥ GKL.ini".

9-3.About creation of tightening program
The tightening program can be created in the following way.
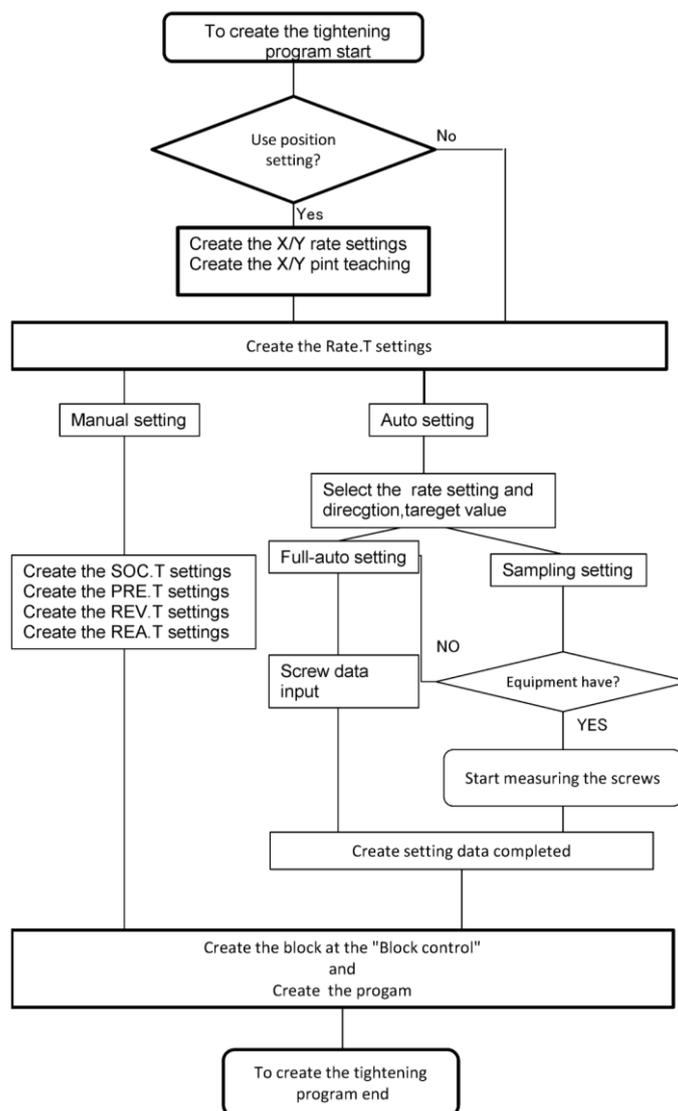
Fig.(9-1): About the tightening program creation method

9-4. 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

・When the setting read

Overall 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	×

・When the setting write

Overall 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) With judgment OFF, each individual operation is unnecessary.

The terminology explanation

・Unit

GKL allows each axis up to 30 axes to operate independently, or it can treat several axes
  as one "unit".
GKL can control up to seven units with one interface unit.
A controller belongs to at least one axis (1 unit at maximum 30 axes) for one unit.
Then, all the axes belonging to one unit are started simultaneously by one input command.
In SIO, another station number is allocated to each unit for GKL.

・Program

The screw tightening program can have 16 programs of 220 steps for 30 axes.
Before entering the program setting, these maximum values can be selected
  from the following ① to ③ which is a combination of axis, program, step maximum value
  on the program Max value selection screen.
① 30 axes, 16 program No., 220 steps.
② 30 axes, 50 program No., 70 steps,
③ 8 axes, 50 program No., 220 steps
One program starts with the control flag (synchronous etc) and the rated setting,
  you can set the operation of maximum 220 steps.
  (It changes according to the setting of the program Max value selection screen.)
However, it treats the end as one step.
At least one block must be set in the program.

・Block

The block is an operation group of the screw tightening program.
On the setting PC, you can set each action and see the setting value of the block operation
  with the waveform image.
In the program setting, the block is inserted with a rated screw number, zero check, etc.
In the program setting, the inserted block starts from the rating and shows a block
  until the end step.
In automatic operation, one block is executed by one program start.
In the block end step, the judgment (block OK / NG) for the operated block is output.
If it becomes "NG" at any step in the block, it becomes "block NG" judgment
  (except when there is a retry), the next step in the block will not be executed.

・Step

Each operation(SOC.T, PRE.T, REV.T, REA.T) in the program, end, and retry are called steps.
One or more blocks are required in the program.
The program runs from step 1 and ends at the end of the last block.
In the final block end step, comprehensive judgment (total OK / NG) is output.
Each axis in the unit operates in step synchronization.
In addition, the servo is turned off for the axes that have completed the step and wait
  for the step action to complete of the other axes.
Once all axis steps have been completed, the next step will work.

・QL input

If the screw tightening operation is not within the OK range in the block performing
  the tightening operation, "NG" is output for that block.
At this time, judgment "NG" can be changed to "OK" by inputting the tightening output
  of the torque wrench with limit switch to the controller.
This input is called "QL input".

・Retry

Using this function, when each action(SOC.T, PRE.T, REV.T, REA.T)
  in the block becomes NG, you can perform the retry operation.
When retry is set on the step, GKL executes the operation from the retry step
  to the end step when NG occurs from the block start to the step before the retry step.
If NG does not occur, the process jumps from the retry step to the end step,
  and the subsequent operation is not executed.

・SOC.T
　This operation is used for the crown action of the socket and screw before tightening
　　and for the socket sticking prevention action after screw tightening.

・PRE.T
　This is an operation to perform temporary attachment until the screw is seated.

・REV.T
　This motion is an operation to loosen the screw after seating a few turns.
　By monitoring the residual torque at the time of this loosening operation,
　　it is possible to judge the seizing of the bolt.

・Rea.T
　This is the final tightening operation to tighten the screw to the target torque.

・Tightening data output setting
　You can connect the interface unit and the PLC by serial communication,
　　exchange engine numbers, set calendar, send result data, etc.

・Tightening sampling operation
　It rotates in a tightening direction at a constant speed and ends
　　when it reaches "tightening sampling stop torque".
　By this operation, information to be used for "tightening sampling setting"
　　of "Auto setting" is collected.

・End synchronization
　With this synchronization, after completion of the PRE.T or REA.T, it will tighten
　　until it reaches the end torque at 5 rpm.

・Stretching waveform
　This is the waveform of the amount of torque increase for each fixed angle
　　from the start torque of angle measurement to the cut torque.

The revise history

Version	Change contents	notes
The 1st edition	Creation	18.12.01
The 2nd edition	Contact information update	20.03.11

技研工業株式会社

The 2nd edition