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***INSTRUCTION MANUAL***  
***FOR***  
***GSL/GSLW SETUP SOFTWARE***

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GIKEN INDUSTRIAL CO., LTD.

## **Before beginning operation:**



### ■ Note

1. Please read this instruction manual carefully in order to ensure that you use this product correctly.
2. A part or no part of this instruction manual may be used or reproduced without the permission of Giken Industrial Co.,Ltd.
3. Regarding the handling process and operation that are not listed in this instruction manual, please think that they cannot be operated, and do not attempt to operate them. Any defect that would occur when the handling process or the operation that is not listed in this instruction manual is executed should be excluded in the scope of the warranty.
4. Matters listed in this instruction manual are subject to change for the improvement without notice.



### ■ Measures in case of an emergency

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

## Outline

This product is the setup software for the GSL/GSLW controller.

Setup input can be entered from the front panel of the controller manually for the GSL/GSLW controller, but this software is used to facilitate the setup input in a way easy to understand. When the personal computer with this software installed is used, it is possible to simplify the initial setup input and improve the maintainability due to its batch transmission function while monitoring the display screen.

As the other feature, the tightening history can be read and the torque waveform display can be checked by sampling the tightening torque value.

## Hardware requirements

OS: WINDOWS '95

WINDOWS '98

WINDOWS NT

WINDOWS ME

WINDOWS 2000

WINDOWS XP

RAM: 64MB or more

Installation destination: C: ¥Program Files¥GSL Setup

Activation method: Execute GSL\_IF.exe

Password to write to the controller is 2003.

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## 1. MAIN MENU

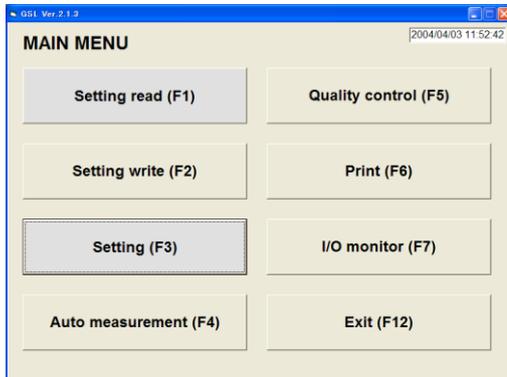
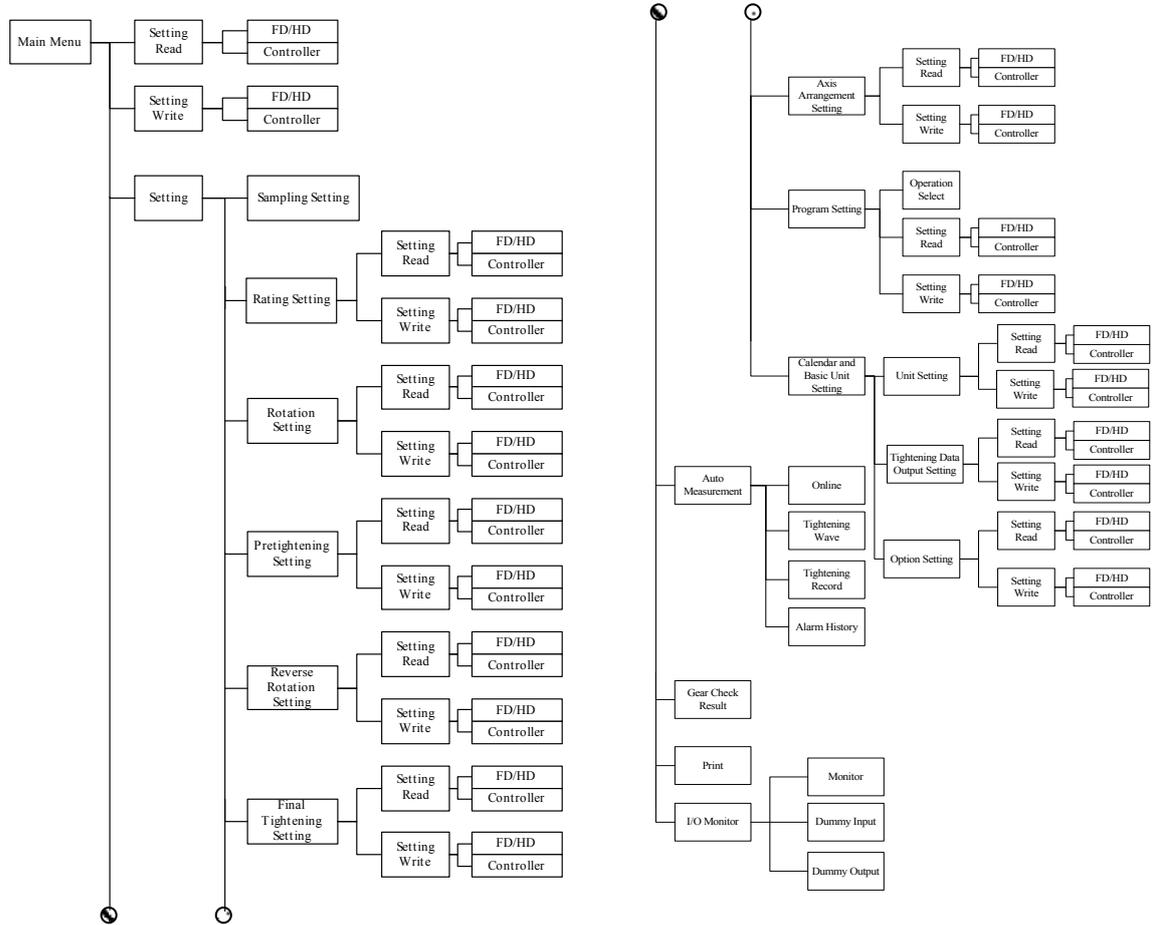


Fig. 1-1. MAIN MENU

- **SETTING READ (F1)**  
Loads settings from a file or the controller.
- **SETTING WRITE (F2)**  
Writes settings to a file or the controller.
- **SETTING (F3)**  
Displays the SETTING screen.
- **AUTO MEASUREMENT (F4)**  
Displays the AUTO MEASUREMENT MENU.
- **QUALITY CONTROL (F5)**  
Displays the QUALITY CONTROL screen.
- **PRINT (F6)**  
Displays the PRINT screen.
- **I/O MONITOR (F7)**  
Displays the I/O MONITOR MENU.
- **EXIT (F12)**  
Exits the program.

### 1-1. Organizations of Screens

The organization of screens is diagrammatically shown below.



### 1-2. Automatic Communication Check

When the program is started, the communication baud rate of the GSL controller is automatically detected and set accordingly.

If the program is started without connecting the GSL controller, the settings for the last successful communication are used.

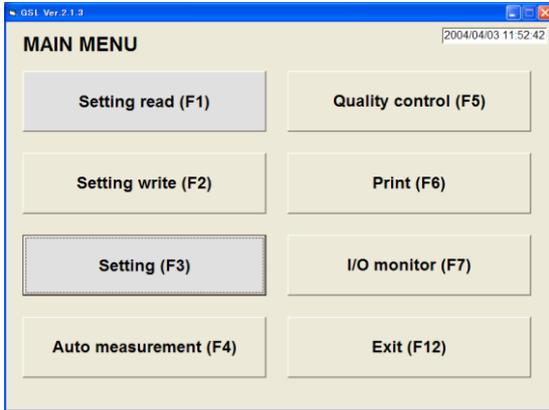


Fig. 1-2. MAIN MENU (communication check in progress)



Fig. 1-3. Initial communication check error

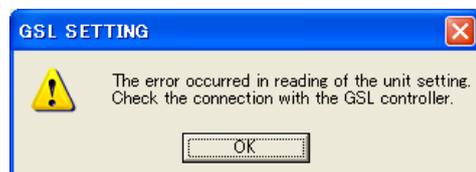


Fig. 1-4. Unit setting acquisition error

When the program is started, the unit settings of the GSL controller are automatically acquired.

### 1-3. Automatic Communication Check Function

When the program is started, the version of the GSL controller is automatically checked.

When the product is attempted to connect with the GSL controller that cannot be connected, the alarm message appears and the program exits.

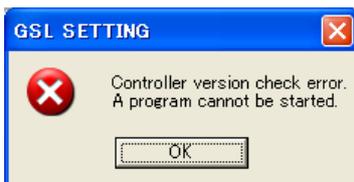


Fig.1-5. Controller version check error

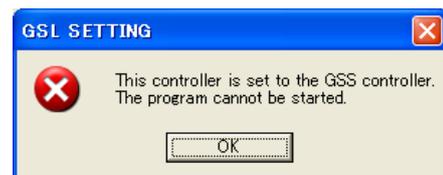


Fig.1-6. GSL check error

When the product is connected with the controller that is set to GSL, the alarm message also appears and the program exits.

## 2. SETTING READ

The SETTING READ screen allows you to load GSL settings from a file or the controller.

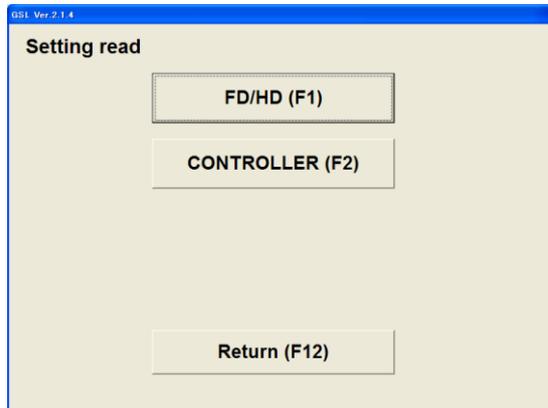


Fig. 2-1. SETTING READ screen

### 2-1. FD/HD

- FD/HD (F1)  
Loads GSL settings from a file.
- CONTROLLER (F2)  
Loads GSL settings from the GSL controller.  
This requires that the GSL controller be previously connected to the personal computer using an RS-232C cable.
- RETURN (F12)  
Returns to the MAIN MENU.



To load GSL settings, select a file with this extension.

Fig. 2-2. Selecting the file to be loaded

Using the FILE SELECT dialog box, select the GSL settings file you want to load.

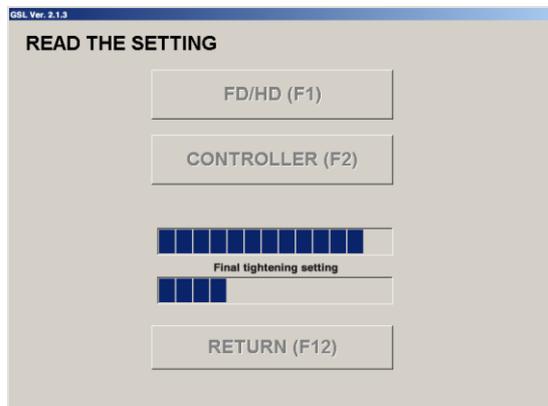


Fig. 2-3. Progress of loading from FD/HD

When the GSL settings file has been loaded successfully, the following message appears.

After the GSL settings file has been loaded, the SETTING screen is displayed.

Password input appears to display the SETTING screen.



Fig. 2-4. Message for successful completion of loading the data

When a file for GSL settings is selected, its loading is started.

The progress of this loading is displayed.

The GSL settings file contains the following settings:

- |                            |                           |
|----------------------------|---------------------------|
| Unit settings              | Rating settings           |
| Rotation settings          | Pretightening settings    |
| Reverse rotation settings  | Final tightening settings |
| Axial arrangement settings | Program settings          |

## 2-2. Using the CONTROLLER Key

When the CONTROLLER key is clicked, GSL settings are loaded from the GSL controller.

This requires that the GSL controller be previously connected to the personal computer using an RS-232C cable.

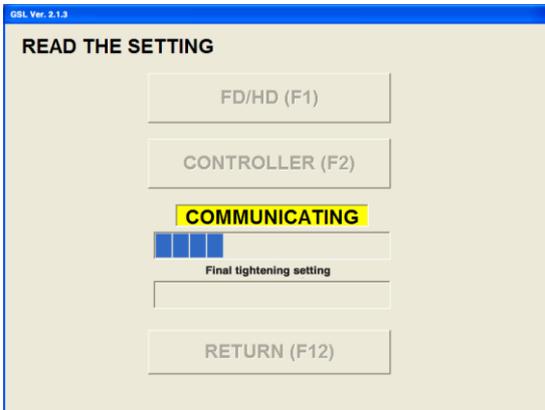


Fig. 2-5. Progress of loading from controller



Fig. 2-6. Message for successful completion of loading the data from controller

When the loading from the controller has been finished, the following message appears. When the loading from the controller has been finished, the screen moves to the setting menu. Password input appears to display the SETTING screen.

### 3. SETTING WRITE

The SETTING WRITE screen allows you to write settings to a file or the controller.

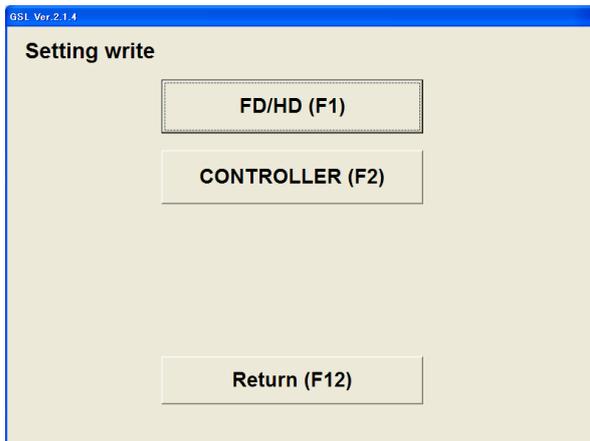


Fig. 3-1. SETTING WRITE screen

- **FD/HD (F1)**  
Writes GSL settings to a file.
- **CONTROLLER (F2)**  
Writes GSL settings to the GSL controller.  
This requires that the GSL controller be previously connected to the personal computer using an RS-232C cable.
- **RETURN (F12)**  
Returns to the MAIN MENU.

#### 3-1. Using the FD/HD Key

When the FD/HD key is clicked, GSL settings are written to a file on the floppy disk (FD), hard disk (HD), or other accessible media.

The file for the GSL settings is saved under a name with an extension of GSL.

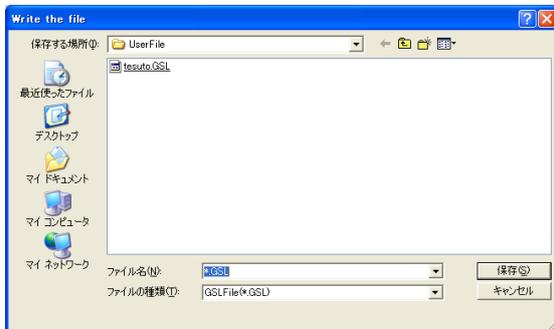


Fig. 3-2. Selecting a file to write settings

Using the FILE SELECT dialog box, select the file to which you want to write GSL settings.

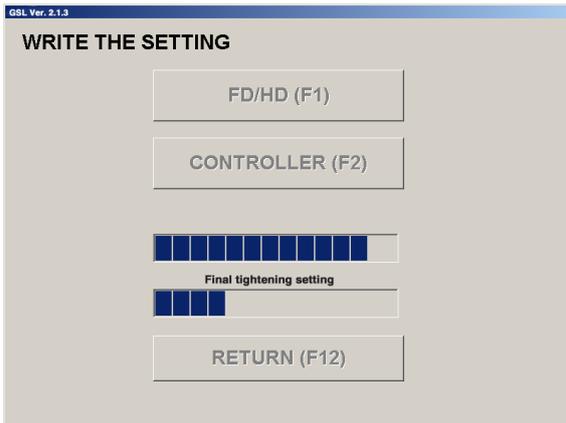


Fig. 3-3. Progress of writing to FD/HD



Fig. 3-4. Message for successful completion of writing the data to the GSL settings file

When a file is selected, writing is started.

The progress of writing GSL settings to the file is displayed.

The following settings are saved in the GSL settings file.

- |                           |                           |                           |                        |
|---------------------------|---------------------------|---------------------------|------------------------|
| Unit settings             | Rating settings           | Rotation settings         | Pretightening settings |
| Reverse rotation settings | Final tightening settings | Axis arrangement settings | Program settings       |

When the settings have been successfully written to the GSL settings file, the message on the right appears:

### 3-2. Using the CONTROLLER Key

When the CONTROLLER key is clicked, GSL settings are written to the GSL controller.

This requires that the GSL controller be previously connected to the personal computer using an RS-232C cable.

Writing data to the controller requires entering your password. (Password: 2003) If your password is incorrect, you are not permitted to write GSL settings to the controller.



Fig. 3-5. Password check

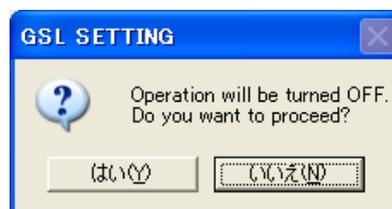


Fig. 3-6. Operation ready OFF check

Operation ready is forcibly turned OFF after checking the password. Select “Yes” when the operation ready is allowed to be turned OFF. If the operation ready is not turned OFF, you are not permitted to write.

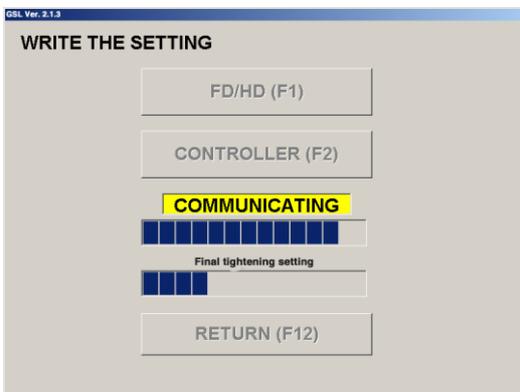


Fig. 3-7. Progress of writing to the controller



Fig. 3-8. Message for successful completion of writing the data to the controller

When the GSL settings have been successfully written to the controller, the message (Fig. 3-8.) appears.

## 4. SETTING

When SETTING is selected from the MAIN MENU, the SETTING screen is displayed.

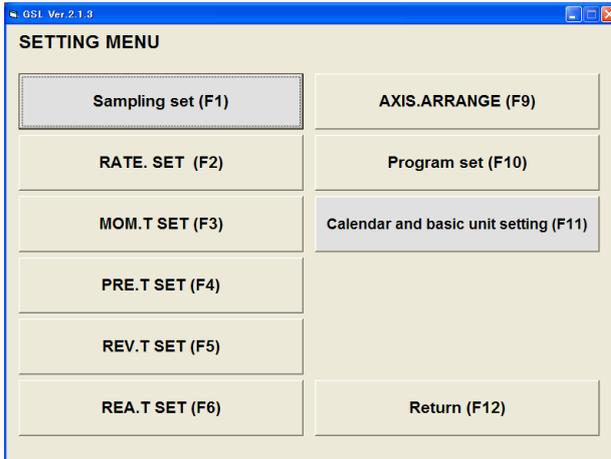


Fig. 4. SETTING screen

- SAMPLING SET (F1)  
Displays the SAMPLING SET screen.
- MON.T SET (F3)  
Displays the MON.T SET screen.
- REV.T SET (F5)  
Displays the REV.T SET screen.
- AXIS.ARRANGE SET (F9)  
Displays the AXIS.ARRANGE SET screen.
- CALENDAR AND BASIC UNIT SETTING (F11)  
Displays the CALENDAR AND BASIC UNIT SETTING screen
- RATE. SET (F2)  
Displays the RATE. SET screen.
- PRE.T SET (F4)  
Displays the PRE.T SET screen.
- REA.T SET (F6)  
Displays the REA.T SET screen.
- PROGRAM SET (F10)  
Displays the PROGRAM SET screen.
- RETURN (F12)  
Returns to the MAIN MENU

### 4-1. SAMPLING SET

The SAMPLING SET screen allows you to sample the tightening angle and simply provide the rating, pretightening, final tightening, and program settings.

For the pretightening and final tightening settings, values are established in the uncompleted setting No.

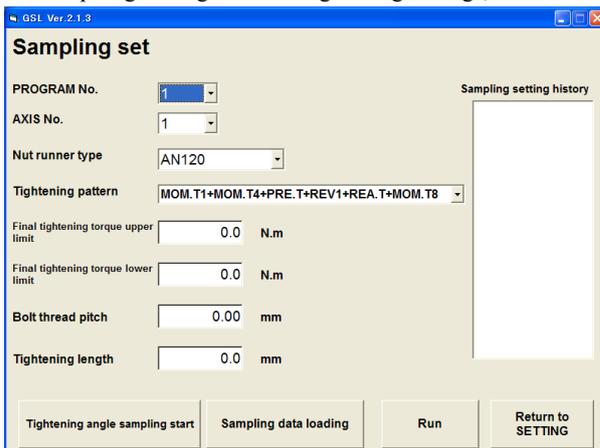


Fig. 4-1. SAMPLING SET screen

- Program No.  
Specify the setting number for which the pretightening, final tightening, and program settings are simply provided.  
The pretightening, final tightening, and program settings for the specified number are updated.
- Axis No.  
Specify the axis number for which the settings are being simply provided.  
The rating and program settings for the specified number are updated.
- Nut Runner Type  
Specify a nut runner type.  
The specified nut runner is updated in the rating settings.
- Tightening Pattern  
Select the tightening pattern that is being simply provided.  
The program settings are updated with the specified tightening pattern.
- Final Tightening Torque     Upper Limit (0 to 999.9)  
The pretightening and final tightening settings are updated with the specified upper limit of final tightening torque.
- Final Tightening Torque     Lower Limit (0 to 999.9)  
The pretightening and final tightening settings are updated with the specified lower limit of final tightening torque.
- Bolt Thread Pitch (0 to 99.99)  
The pretightening settings are updated with the specified bolt thread pitch.
- Tightening Length (0 to 999.9)  
The pretightening settings are updated with the specified tightening length.
- Sampling Setting History  
The program number and axis number for which the simple settings have been provided are displayed as history.
- Tightening Angle Sampling Start  
The tightening angle starts being sampled.
- Sampling Data Loading  
Based on the sampled data on tightening angle, either bolt thread pitch or tightening length is set.
- Run  
The simple settings are run.
- Return to SETTING  
You return to the SETTING screen.

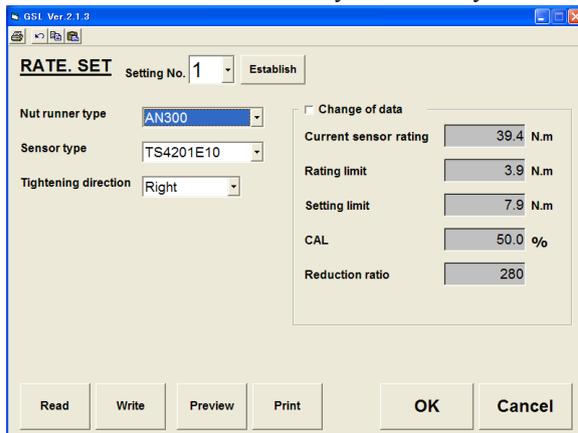
The SAMPLING SET screen allows you to check the input under the following conditions.

Setting against the input rule is not allowed.

- Final Tightening Torque Upper Limit > Final Tightening Torque Lower Limit
- Bolt Thread Pitch > 0
- Tightening Length > 0

## 4-2. RATE. SET

The RATE.SET screen allows you to modify the rating settings.



Print: Prints out the current screen as it is.



Undo: Undoes the last entered data.



Copy: Copies the settings for each axis number.



Paste: Pastes the copied data to the specified setting number.

Fig. 4-2-1. RATE. SET screen

- Setting No.  
Select the setting number for which settings are to be modified.
- Read button  
Displays the RATE. SET READ screen.
- Preview button  
Displays the print preview for the rating settings.
- OK button  
Establishes the modification and returns to the SETTING screen.
- Nut runner type  
Enter a nut runner type.
- Tightening direction  
Enter a tightening direction.
- Rating limit (0 to 999.9)  
Enter a rating limit.
- CAL value (0 to 999.9)  
Enter a CAL value.
- Establish button  
Establishes the modification.
- Write button  
Displays the RATE. SET WRITE screen.
- Print button  
Prints out the rating settings.
- Cancel button  
Cancels the modification and returns to the SETTING screen.
- Sensor type  
Enter a sensor type.
- Setting limit (0 to 999.9)  
Enter a setting limit.
- Reduction ratio (0 to 9999)  
Enter a reduction ratio.

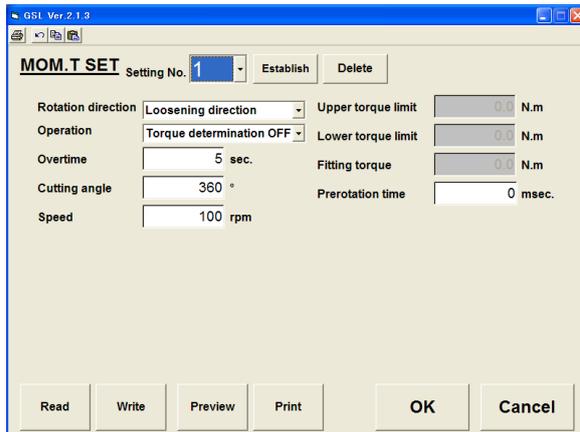
The RATE. SET screen allows you to check the input under the following conditions.

Setting against the input rule is not allowed.

- Rating Limit < Torque sensor rating
- Setting Limit < Torque sensor rating
- CAL Value < Torque sensor rating

### 4-3. MOM.T SET

The MOM.T SET screen allows you to provide rotation settings.



Print: Prints out the current screen as it is.



Undo: Undoes the last entered data.



Copy: Copies the settings for each axis number.



Paste: Pastes the copied data to the specified setting number.

Fig. 4-3-1. MOM.T SET screen

- Setting No.  
Select the setting number for which settings are to be modified.
- Read button  
Displays the MOM.T SET READ screen.
- Preview button  
Displays the print preview for the rotation settings.
- OK button  
Establishes the modification and returns to the DETAILED SETTING screen.
- Rotational direction  
Enter a rotational direction.
- Operation
  - Without Torque Evaluation: You cannot enter the upper and lower torque limits and the fitting torque.
  - With Torque evaluation: You cannot enter the fitting torque.
  - Fitting: You cannot enter the upper and lower torque limits.
  - Gear Check: Enter the upper torque limit only.
- Overtime (1 to 60)  
Enter the overtime.
- Speed (0 to 9999)  
Enter the speed.
- Upper Torque Limit (0 to 999.9)  
Enter the upper torque limit. Note: This value may be entered when “With Torque Evaluation” is selected in Operation.
- Lower Torque Limit (0 to 999.9)  
Enter the lower torque limit. Note: This value may be entered when “With Torque Evaluation” is selected in Operation.
- Fitting Torque (0 to 999.9)  
Enter the fitting torque. Note: This value may be entered when “Fitting” is selected in Operation.
- Prerotation Time (0 to 9999)  
Enter the prerotation time.
- Establish button  
Establishes the modification.
- Write button  
Displays the MOM.T SET WRITE screen.
- Print button  
Prints out the rotation settings.
- Cancel button  
Cancels the modification and returns to the DETAILED SETTING screen.
- Delete button  
Deletes the settings for the specified setting number.
- Cutting angle (0 to 9999)  
Enter the cutting angle.

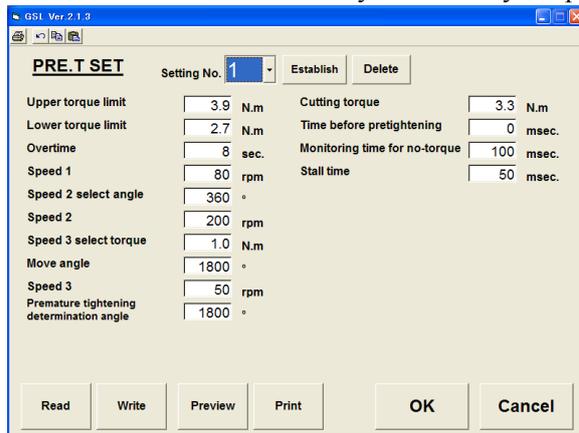
MOM.T SET screen allows you to check the input under the following conditions.

Setting against the input rule is not allowed.

- Overtime  $\geq 1$
- When the action is “Torque Determination is ON.”  
Upper torque limit > Lower torque limit

#### 4-4. PRE.T SET

The PRE.T SET screen allows you to modify the pretightening settings.



Print: Prints out the current screen as it is.



Undo: Undoes the last entered data.



Copy: Copies the settings for each axis number.



Paste: Pastes the copied data to the specified setting number.

Fig. 4-4-1. PRE.T SET screen

- Setting No.  
Select the setting number for which settings are to be modified.
- Read button  
Displays the PRE.T SET READ screen.
- Preview button  
Displays the print preview for the pretightening settings.
- OK button  
Establishes the modification and returns to the DETAILED SETTING screen
- Upper torque limit (0 to 999.9)  
Enter the upper torque limit.
- Overtime (1 to 60)  
Enter the overtime.
- Moving angle (0 to 9999)  
Enter the moving angle.  
It will be unconditionally the third speed after the specified angle.
- Delete button  
Deletes the settings for the specified setting number.
- Speed 2 select angle (0 to 9999)  
Enter speed 2 select angle.
- Speed 2 (0 to 500)  
Enter Speed 2.
- Time before pretightening (0 to 65500)  
Enter the time before pretightening.
- Stall time (0 to 65500)  
Sets the stall time.
- Establish button  
Establishes the modification.
- Write button  
Displays the PRE.T SET WRITE screen.
- Print button  
Prints out the pretightening settings.
- Cancel button  
Cancels the modification and returns to the DETAILED SETTING screen.
- Lower torque limit (0 to 999.9)  
Enter the lower torque limit.
- Speed 1 (0 to 9999)  
Enter speed 1.
- Speed 3 (0 to 200)  
Enter Speed 3.
- Speed 2 select torque (0 to 999.9)  
Enter speed 2 select torque.
- Cutting torque (0 to 999.9)  
Enter a cutting torque.
- Monitoring time for no-torque (0 to 65500)  
Sets the monitoring time for no-torque condition.
- Premature tightening determination angle  
Determines as the premature tightening NG if it reaches the cutting torque value within the specified angle.

PRE.T SET screen allows you to check the input under the following conditions.

Setting against the input rule is not allowed.

- Overtime  $\geq$  1
- Upper torque limit > Lower torque limit
- Moving angle  $\geq$  Speed 2 select angle
- Upper torque limit > TS 1 : Pretightening cutting torque > Lower torque limit

## 4-5. REV.T SET

The REV.T SET screen allows you to modify the reverse rotation settings.

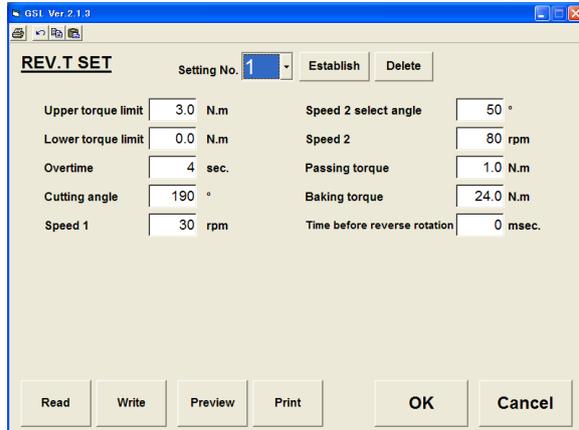


Fig. 4-5-1. REV.T SET screen



Print: Prints out the current screen as it is.



Undo: Undoes the last entered data.



Copy: Copies the settings for each axis number.



Paste: Pastes the copied data to the specified setting number.

- Setting No.  
Select the setting number for which settings are to be modified.
- Read button  
Displays the REV.T SET READ screen.
- Preview button  
Displays the print preview for the reverse rotation settings.
- OK button  
Establishes the modification and returns to the DETAILED SETTING screen.
- Upper torque limit (0 to 999.9)  
Enter the upper torque limit.
- Overtime (1 to 60)  
Enter the overtime.
- Speed 1 (0 to 9999)  
Enter speed 1.
- Speed 2 (0 to 9999)  
Enter speed 2.
- Delete button  
Deletes the settings for the specified setting number.
- Baking torque (0 to 999.9)  
When the torque exceeds its preset value in the reverse rotation, it becomes “REV.T BAKING TORQUE NG”.
- Establish button  
Establishes the modification.
- Write button  
Displays the REV.T SET WRITE screen.
- Print button  
Prints out the reverse rotation settings.
- Cancel button  
Cancels the modification and returns to the DETAILED SETTING screen.
- Lower torque limit (0 to 999.9)  
Enter the lower torque limit.
- Cutting angle (0 to 9999)  
Enter the cutting angle
- Speed 2 select angle (0 to 9999)  
Enter Speed 2 select angle.
- Passing torque. (0 to 999.9)  
When the step stops while no condition exists more than the specified value in the reverse rotation, it becomes “REV.T PASSING TORQUE NG”.
- Time before reverse rotation (0 to 65500)  
Enter the time before reverse rotation.

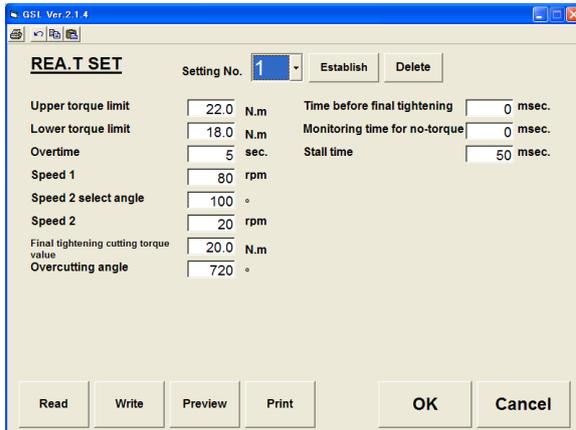
REV.T SET screen allows you to check the input under the following conditions.

Setting against the input rule is not allowed.

- Overtime  $\geq$  1
- Upper torque limit  $>$  Lower torque limit
- Select angle  $\leq$  Cutting angle

#### 4-6. REA.T SET

The REA.T SET screen allows you to modify the final tightening settings.



Print: Prints out the current screen as it is.



Undo: Undoes the last entered data.



Copy: Copies the settings for each axis number.



Paste: Pastes the copied data to the specified setting number.

Fig. 4-6-1. REA.T SET screen

- Setting No.  
Select the setting number for which settings are to be modified.
- Read button  
Displays the REA.T SET READ screen.
- Preview button  
Displays the print preview for the final tightening settings.
- OK button  
Establishes the modification and returns to the DETAILED SETTING screen.
- Upper torque limit (0 to 999.9)  
Enter the upper torque limit.
- Overtime (1 to 60)  
Enter the overtime.
- Speed 2 Select Angle (0 to 9999)  
Enter Speed 2 Select Angle.
- Final tightening cutting torque value (0 to 999.9)  
Enter the final tightening cutting torque value.
- Overcutting angle (0 to 9999)  
Changes the overcutting angle.
- Stall time (0 to 65500)  
Set the stall time.
- Establish button  
Establishes the modification.
- Write button  
Displays the REA.T SET WRITE screen.
- Print button  
Prints out the final tightening settings.
- Cancel button  
Cancels the modification and returns to the DETAILED SETTING screen.
- Lower torque limit (0 to 999.9)  
Enter the lower torque limit.
- Speed 1 (0 to 9999)  
Enter speed 1.
- Speed 2 (0 to 999)  
Enter speed 2.
- Time before final tightening (0 to 65500)  
Enter the time before final tightening.
- Monitoring time for no-torque (0 to 65500)  
Set the monitoring time for no-torque.
- Delete button  
Deletes the settings for the specified setting number.

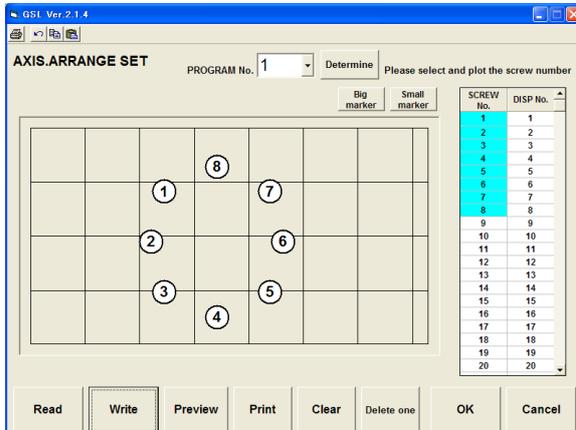
REA.T SET screen allows you to check the input under the following conditions.

Setting against the input rule is not allowed.

- Overtime  $\geq 1$
- Upper torque limit  $>$  Lower torque limit
- Speed 2 select angle  $\leq$  Cutting angle of REV.T setting 6
- Upper torque limit  $>$  Final tightening cutting torque value  $>$  Lower torque limit

#### 4-7. AXIS.ARRANGE SET

The AXIS.ARRANGE SET screen allows you to enter axial arrangement data.



Print: Prints out the current screen as it is.



Undo: Undoes the last entered data.



Copy: Copies the settings for each axis number.



Paste: Pastes the copied data to the specified setting number.

Fig. 4-7-1. AXIS.ARRANGE SET screen

- Program No.  
Enter the desired program number.
- Axial arrangement form  
Determine the axial arrangement on the axial arrangement form by clicking on the left mouse button.
- Read  
Displays the AXIS.ARRANGE SET READ screen.
- Print  
Prints out the currently displayed screen as it is.
- Delete one  
Deletes the last entry of the axial arrangement data on the screen.
- Cancel  
Cancels the settings and returns to the SETTING screen.
- Big marker/Small marker  
It allows you to change the display size of the axis.
- Screw No. select  
Select screw numbers you want to plot.
- Write  
Displays the AXIS.ARRANGE SET WRITE screen.
- Clear  
Deletes all the axial arrangement data on the screen.
- OK  
Establishes the settings and returns to the DETAILED SETTING screen.

## 4-8. PROGRAM SET

The PROGRAM SET screen allows you to change the program.

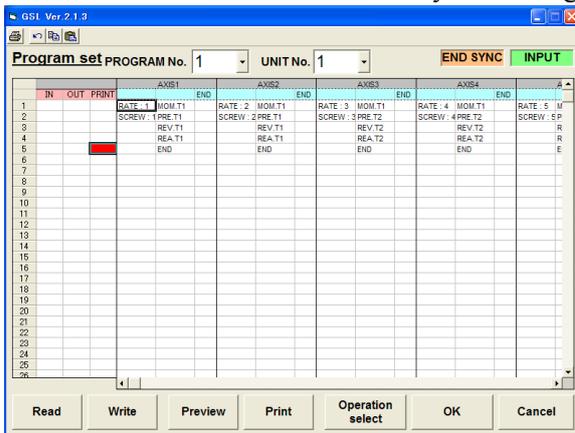


Fig. 4-8-1. PROGRAM SET screen

- Program No.  
Specify the program number you want to set up.
- Unit No.  
Specify the unit number.
- Program sheet  
Displays the program selected with the specified program number or unit number.
- Read button  
Displays the PROGRAM SET READ screen.
- Preview button  
Displays a print preview of the program settings.
- Operation select button  
Select an area on the program sheet and then press this button.  
The PROGRAM OPERATION SELECT screen will be displayed.
- OK button  
Establishes the modification and returns to the SETTING screen.



Print: Prints out the current screen as it is.



Undo: Undoes the last entered data.



軸、ブロックのコピー  
プログラムのコピー

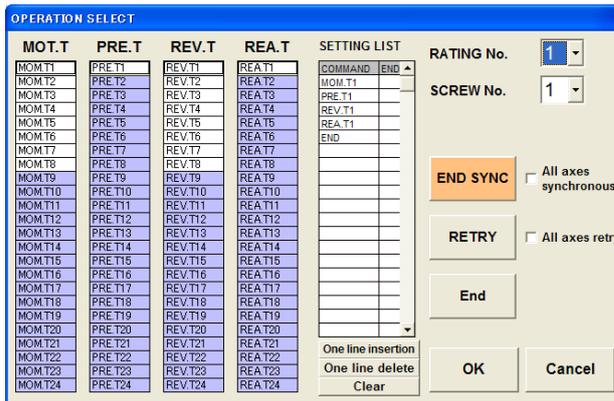
Copy: Copies the settings for each program number.  
It allows you to copy by selecting the axial unit, block unit or program unit. It can be selected on the drop down menu. When the button is clicked on, “Copy the axis and block” will be executed.



Paste: Pastes the copied data to the specified program number.

- Write button  
Displays the PROGRAM SET WRITE screen.
- Print button  
Prints out the program settings.
- Cancel button  
Cancels the modification and returns to the SETTING Screen.

#### 4-8-1. OPERATION SELECT screen



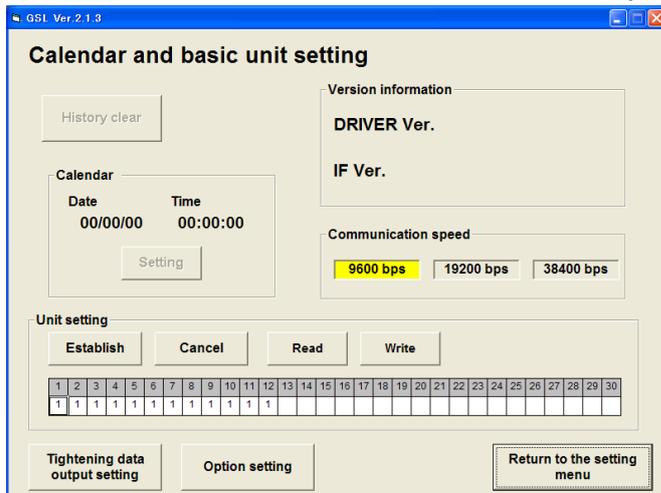
Note: In Rotation, Pretightening, Reverse, Final Tightening Select Lists, only the setting items in the white fields are available for the program.

Fig. 4-8-2. OPERATION SELECT screen

- Rotation, Pretightening, Reverse, Final Tightening Select List  
Clicking a setting item will add it to the settings list.
- Settings list  
Displays the programmed data.
- Line delete button  
Deletes one line from the settings list.
- Rating number  
Enter the rating number.
- End synchronous button  
When a line is selected from the setting data list and the end synchronous button is clicked on, the end synchronous is set. The end synchronous that has been synchronized for all axes can not release the setting of end synchronous when the mouse has been clicked in the all axis check boxes. It can be released when the check marks in the all axis check boxes are removed.
- All axes synchronous check box  
Performs the end synchronous for all axes. The end synchronous that has been synchronized for all axes cannot be changed. To change it, remove the check mark in the end synchronous box.
- Retry button  
Adds a retry to the settings list. Inserts the retry to the same step of other axis even if the check mark in the all axes retry box has been removed.
- All axes retry check box  
Adds a retry to all axes. Retry that has been retried to all axes cannot be changed. To change, remove the check mark in the all axes retry check box.
- End button  
Adds an end to the setting data list.
- Cancel button  
Cancels the settings and returns to the PROGRAM SET screen.
- One line insertion button  
Inserts one line to the setting data list.
- Clear button  
Clears all the lines of the settings list.
- Tightening screw number  
Enter the tightening screw number.
- OK button  
Establishes the settings and returns to the PROGRAM SET screen.

## 4-9. CALENDAR AND BASIC UNIT SETTING

The CALENDAR AND BASIC UNIT SETTING screen allows you to set the calendar and basic units.



Note: To operate the history clear/calendar setting button, the password is required. (Password: 2003)

Fig. 4-9-1. CALENDAR AND BASIC UNIT SETTING screen

- History clear button  
Clears the history on the controller.
- Calendar display  
Displays the calendar information on the controller in real time.
- Calendar setting button  
Sets the current date and time on the PC to those on the controller.
- Transmission rate display  
Displays the transmission rate with the controller.
- Establish button  
Establishes the entered unit data.
- Read button  
Displays the UNIT SETTING READ screen.
- Tightening data output setting  
Displays the TIGHTENING DATA OUTPUT SETTING screen.
- Return to SETTING screen  
Returns to the SETTING screen.
- Version display  
Displays the version of the controller.
- Unit setting  
Sets the unit to which each axis belongs.
- Cancel button  
Cancels the entered unit data.
- Write button  
Displays the UNIT SETTING WRITE screen.
- Option setting  
Displays the OPTION SETTING screen.

#### 4-10. TIGHTENING DATA OUTPUT SETTING

Sets the tightening data output.

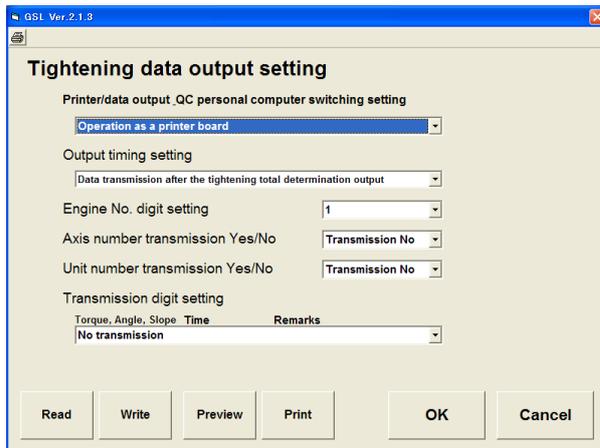


Fig. 4-10-1. TIGHTENING DATA OUTPUT SETTING screen

- Read button  
Displays the TIGHTENING DATA OUTPUT SETTING READ screen.
- Preview button  
Displays the TIGHTENING DATA OUTPUT SETTING print preview.
- OK button  
Establishes the modification and returns to the SETTING screen.
- Write button  
Displays the TIGHTENING DATA OUTPUT SETTING WRITE screen.
- Print button  
Prints out the tightening data output setting.
- Cancel button  
Cancels the modification and returns to the SETTING screen.



Print: Prints out the current screen as it is.

#### 4-11. OPTION SETTING

Sets an option.

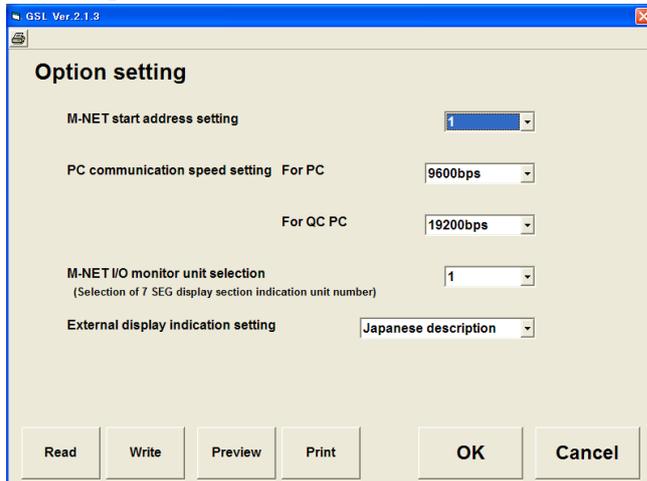


Fig. 4-11-1. OPTION SETTING screen

- Read button  
Displays the OPTION SETTING READ screen.
- Preview button  
Displays the OPTION SETTING print preview.
- OK button  
Establishes the modification and returns to the SETTING screen.
- Write button  
Displays the OPTION SETTING WRITE screen.
- Print button  
Prints out the option setting.
- Cancel button  
Cancels the modification and returns to the SETTING screen.



Print: Prints out the current screen as it is.

## 4-12. SETTING READ AND WRITE ON SETTING SCREENS

Reads and writes the setting of setting screens about the rating, rotation, pretightening, reverse rotation, final tightening, axial arrangement, program, tightening data output and option. Similar setting screens are described in a lot.

### 4-12-1. Reading the rating/rotation/pretightening/reverse rotation/final tightening/axial arrangement/program setting

Reads each setting from a file or the controller.

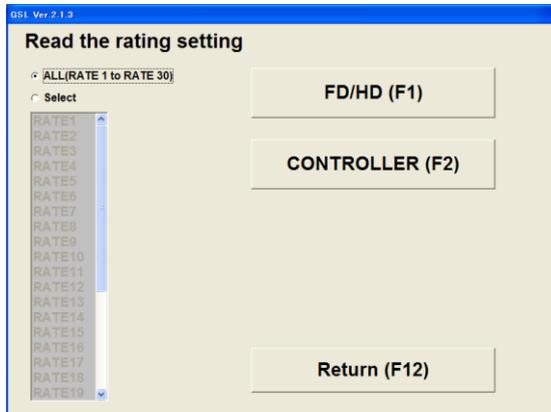


Fig. 4-12-1. SETTING READ screen

- All (Rating 1 to Rating 30)  
Set all items to read.
- Select  
Selects a setting to read. When the select option is specified, it allows you to select the list box of each setting.
- FD/HD (F1)  
Reads each setting from the file.
- Controller (F2)  
Reads each setting from the GSL controller.  
To read the setting from the GSL controller, this requires that the GSL controller be previously connected to the personal computer using an RS-232C cable. If they are not connected via the cable, the communication error occurs.



Fig. 4-12-2. Communication error

- Return (F12)  
Returns to each SETTING screen.

#### 1. FD/HD

Reads each setting data from the FD (floppy disk), HD (hard disk) or other files on the media that is allowed to access in this FD/HD processing.

Setting file that saves each setting data will be saved with a file extension of each setting file.

(Rating: GST, Rotation: GSR, Pretightening: GSK, Reverse rotation: GSG, Final tightening: GSH, Program: GSP

Axial arrangement: GSJ, Unit: GSU, Tightening data output: OUT, Option: OPT)

To select the file to read, select a file with the extension for each file.

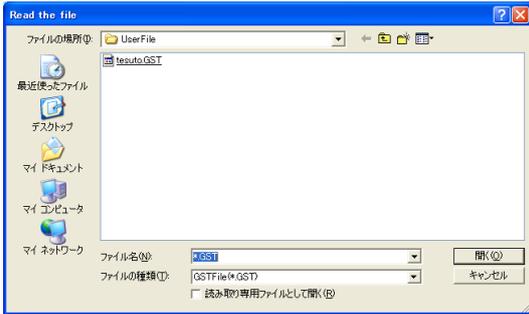


Fig. 4-12-3. READ FILE SELECT screen

Use the file select dialog to select each setting file to read.

When loading of each setting file is finished, the following message appears.

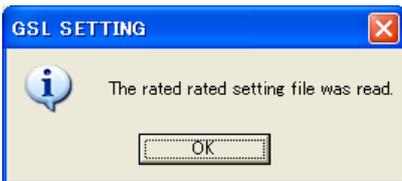


Fig. 4-12-4. Message for successful completion of loading the setting file

## 2. Controller

Reads each setting from the setting value saved in the GSL controller.

When the setting is read from the GSL controller, it requires that the GSL controller be previously connected to the personal computer using an RS-232C cable. If they are not connected via the cable, the communication error occurs.



Fig. 4-12-5. Communication error

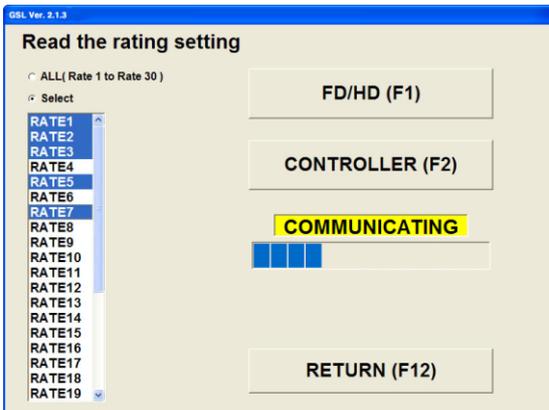


Fig. 4-12-6. Progress of reading from the controller

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



Fig. 4-12-7. Message for successful completion of loading the data from the controller

3. Read select of each setting

If you want to read the specified setting only, choose the select option.

Select the specified setting because the options in the list box can be now selected.

When the FD/HD button is clicked on, only the specified setting is read from the file.

When the controller button is clicked on, only the specified setting is read from the GSL controller.

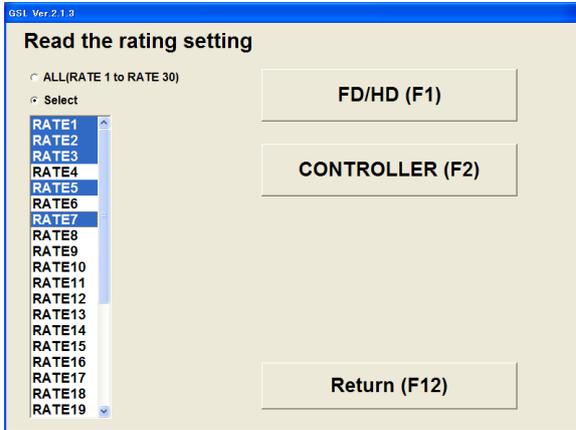


Fig. 4-12-8. Setting and Select

4-12-2. Writing the rating/rotation/pretightening/reverse rotation/final tightening/axial arrangement/program setting

Writes each setting to a file or the controller.

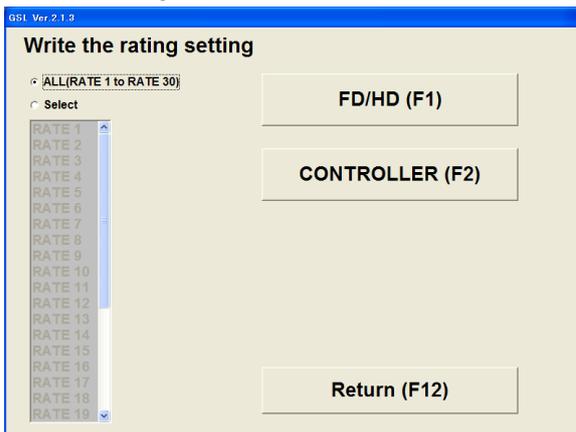


Fig. 4-12-9. SETTING WRITE screen

- FD/HD (F1)  
Writes each setting to the file.
- Controller (F2)  
Writes each setting to the GSL controller.

When the setting is read from the GSL controller, it requires that the GSL controller be previously connected to the personal computer using an RS-232C cable. If they are not connected via the cable, the communication error occurs.



Fig.4-12-10. Communication error

- Return (F12)  
Returns to each setting screen.

## 1. FD/HD

Writes each setting data to the FD (floppy disk), HD (hard disk) or other files on the media that is allowed to access in this FD/HD processing. Setting file that saves each setting data will be saved with a file extension of each setting file. (Rating: GST, Rotation: GSR, Pretightening: GSK, Reverse rotation: GSG, Final tightening: GSH, Program: GSP, Axial arrangement: GSJ, Unit: GSU, Tightening data output: OUT, Option: OPT)

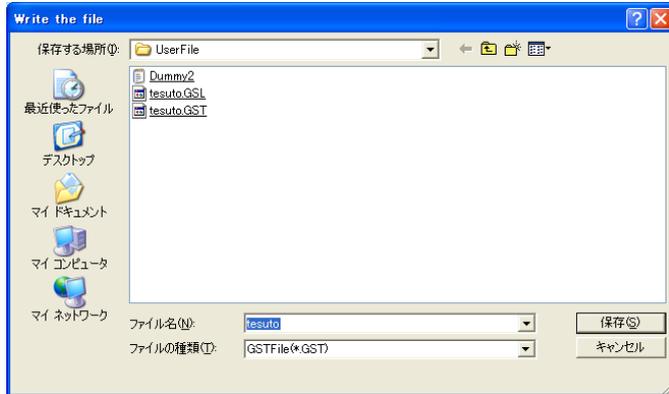


Fig. 4-12-11. Select the file to write

Use the file select dialog to select the setting file to write.

When writing the setting file is finished, the following message appears.



Fig. 4-12-12. Message for successful completion of writing the setting file



Fig. 4-12-13. Communication error

## 2. Controller

Writes each setting to the GSL controller.

To write to the GSL controller, it requires that the GSL controller be previously connected to the personal computer using an RS-232C cable. If they are not connected via the cable, the communication error occurs.

Password is required to write to the controller. (Password: 2003). If your password is incorrect, you are not permitted to write to the controller.



Fig. 4-12-14. Password check

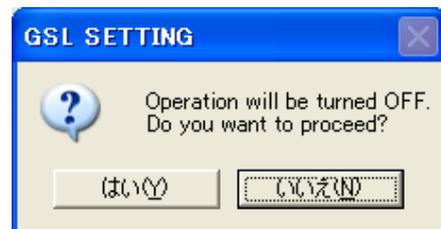


Fig. 4-12-15. Operation ready OFF check

Operation ready is forcibly turned OFF after checking the password. Select “Yes” when the operation ready is allowed to be turned OFF. If the operation ready is not turned OFF, you are not permitted to write.

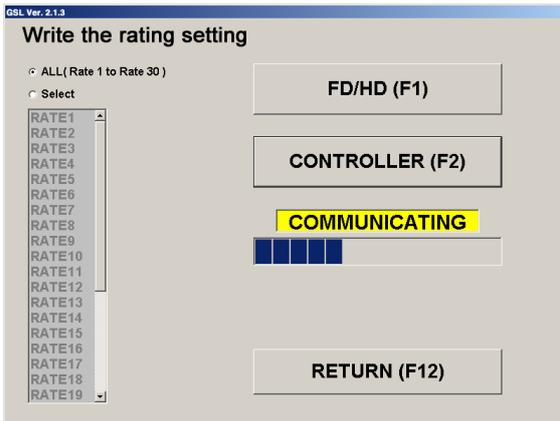


Fig. 4-12-16. Progress of writing to the controller



Fig. 4-12-17. Message for successful completion of writing the setting file

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

### 3. Read select of each setting

If you want to write the specified setting only, choose the select option.

Select the specified setting because the options in the list box can be now selected.

When the FD/HD button is clicked on, only the specified setting is written to the file.

When the controller button is clicked on, only the specified setting is written to the GSL controller.

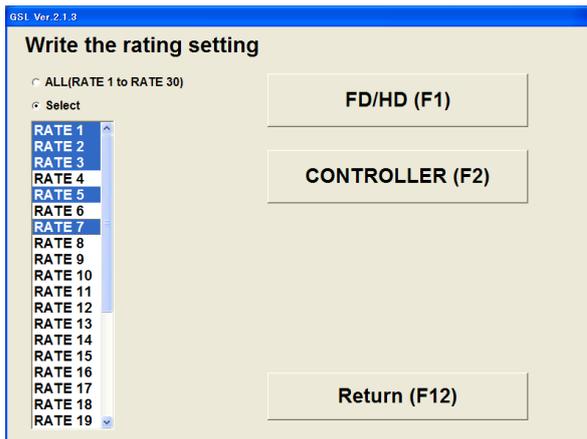


Fig. 4-12-18. Setting Select

### 4-12-3. Reading the unit/tightening data output/option setting

Reads each setting from a file or the controller.

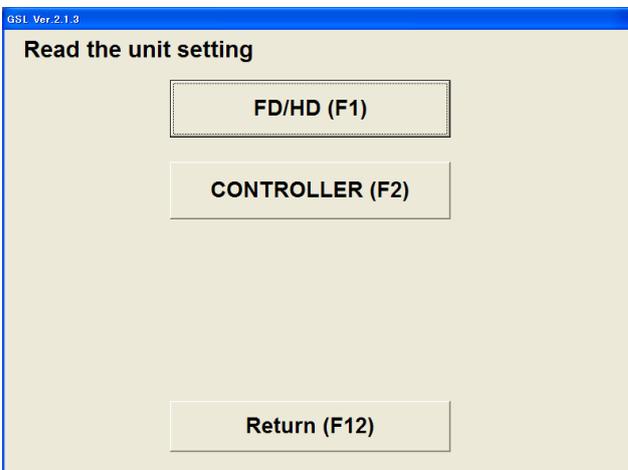


Fig. 4-12-19. SETTING READ screen

- FD/HD  
Reads each setting from the file.
- Controller  
Reads each setting from the GSL controller.  
When each setting is read from the GSL controller, it requires that the GSL controller be previously connected to the personal computer using an RS-232C cable. If they are not connected via the cable, the communication error occurs.



Fig. 4-12-20. Communication error

- Return  
Returns to each setting screen.

### 1. FD/HD

Reads each setting data from the FD (floppy disk), HD (hard disk) or other files on the media that is allowed to access in this FD/HD processing. Setting file that saves each setting data will be saved with a file extension of each setting file. (Rating: GST, Rotation: GSR, Pretightening: GSK, Reverse rotation: GSG, Final tightening: GSH, Program: GSP, Axial arrangement: GSJ, Unit: GSU, Tightening data output: OUT, Option: OPT)

To select the file to read, select a file with the extension for each file.

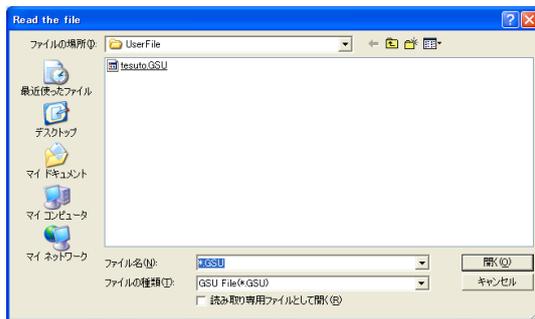


Fig. 4-12-21. Read the file to select

Use the file select dialog to select each setting file to read.

When writing of each setting file is finished, the following message appears.

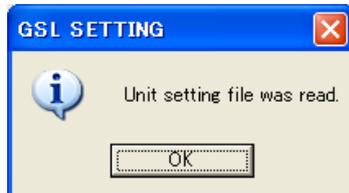


Fig. 4-12-22. Message for successful completion of loading the setting file

### 2. Controller

Reads each setting from the setting value saved in the GSL controller.

When the setting is read from the GSL controller, it requires that the GSL controller be previously connected to the personal computer using an RS-232C cable. If they are not connected via the cable, the communication error occurs.



Fig. 4-12-23. Communication error

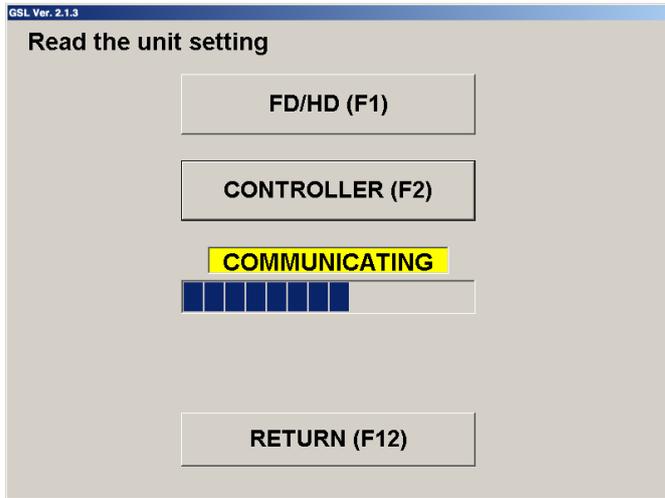


Fig. 4-12-24. Progress of reading

When loading from the controller is completed, the following message appears.



Fig. 4-12-25. Message for successful completion of loading the data from the controller

#### 4-12-4. Writing the unit/tightening data output setting

Writes each setting to a file or the controller.

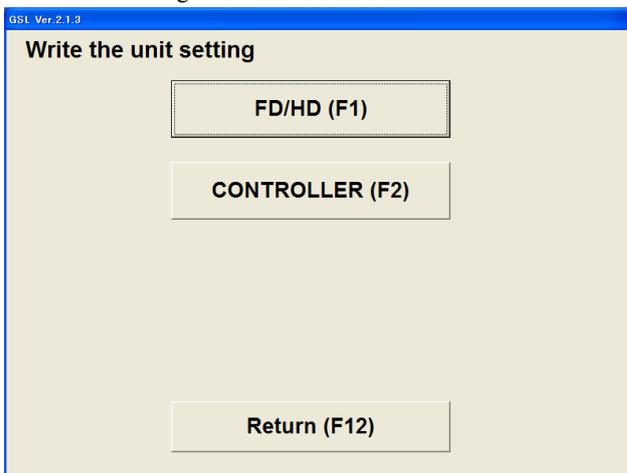


Fig. 4-12-26. SETTING WRITE screen

- FD/HD (F1)  
Writes each setting to the file.
- Controller (F2)  
Writes each setting to the GSL controller.

When the setting is written from the GSL controller, it requires that the GSL controller be previously connected to the personal computer using an RS-232C cable. If they are not connected via the cable, the communication error occurs.



Fig. 4-12-27. Communication error

- Return  
Returns to the unit setting.

#### 1. FD/HD

Writes each setting data to the FD (floppy disk), HD (hard disk) or other files on the media that is allowed to access in this FD/HD processing. Setting file that saves each setting data will be saved with a file extension of each setting file.

(Rating: GST, Rotation: GSR, Pretightening: GSK, Reverse rotation: GSG, Final tightening: GSH, Program: GSP, Axial arrangement: GSJ, Unit: GSU, Tightening data output: OUT, Option: OPT)

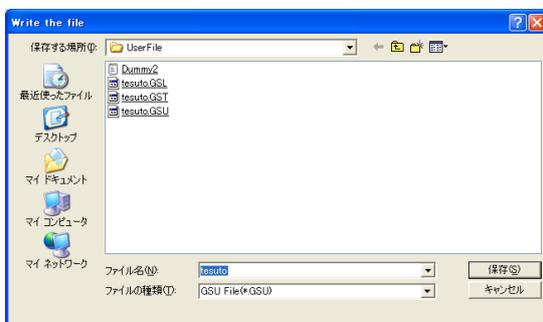


Fig. 4-12-28. Select the file to write

Use the file select dialog to select each setting file to write.  
 When writing of each setting file is finished, the following message appears.



Fig. 4-12-29. Message for successful completion of writing the setting file



Fig. 4-12-30. Communication error

## 2. Controller

Writes the unit setting to the GSL controller.

When writing to the GSL controller, it requires that the GSL controller be previously connected to the personal computer using an RS-232C cable. If they are not connected via the cable, the communication error occurs.

Password is required to write to the controller. (Password: 2003). If your password is incorrect, you are not permitted to write to the controller.

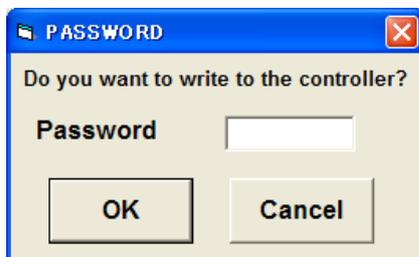


Fig. 4-12-31. Password check

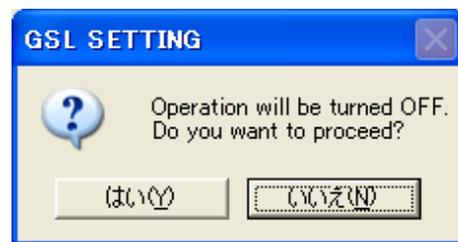


Fig. 4-12-32. Operation ready OFF check

Operation ready is forcibly turned OFF after checking the password. Select “Yes” when the operation ready is allowed to be turned OFF. If the operation ready is not turned OFF, you are not permitted to write.

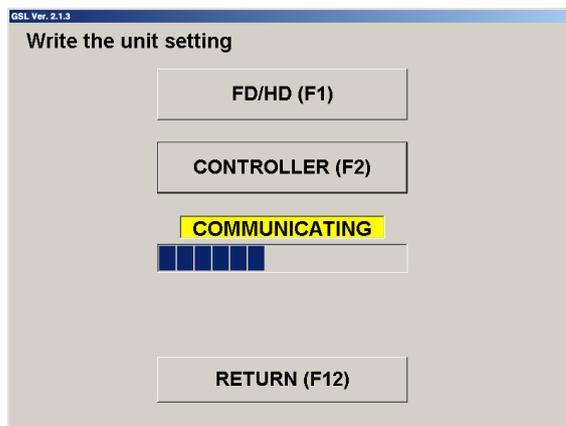


Fig. 4-12-33. Progress of writing to the controller

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



Fig. 4-12-34. Message for successful completion of writing the data to the controller

#### 4-12-5. Option setting write

Writes each setting to the file or the controller.

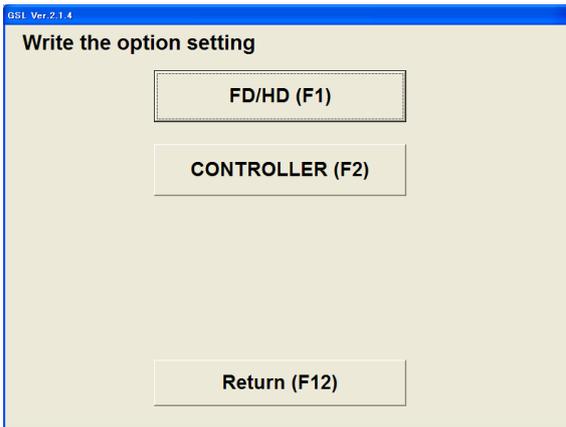


Fig. 4-12-35. SETTING WRITE screen

- FD/HD (F1)  
Writes the option setting to the file.
- Controller (F2)

Write the option setting to the GSL controller.

When the setting is written from the GSL controller, it requires that the GSL controller be previously connected to the personal computer using an RS-232C cable. If they are not connected via the cable, the communication error occurs.



Fig. 4-12-36. Communication error

- Return  
Returns to the option setting.

## 1. FD/HD

Writes the option setting data to the FD (floppy disk), HD (hard disk) or other files on the media that is allowed to access in this FD/HD processing. Setting file that saves each setting data will be saved with a file extension of each setting file. (Rating: GST, Rotation: GSR, Pretightening: GSK, Reverse rotation: GSG, Final tightening: GSH, Program: GSP, Axial arrangement: GSJ, Unit: GSU, Tightening data output: OUT, Option: OPT)

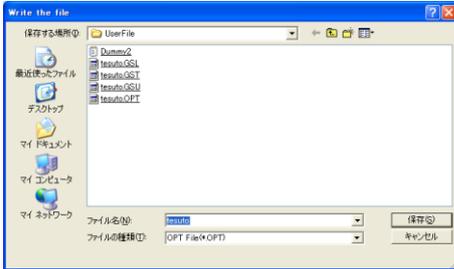


Fig. 4-12-37. Select the file to write

Use the file select dialog to select the option setting file to write.

When writing to the option setting file is finished, the following message appears.



Fig. 4-12-38. Message for successful completion of writing the option setting file

## 2. Controller

Writes the option setting to the GSL controller.

When writing to the GSL controller, it requires that the GSL controller be previously connected to the personal computer using an RS-232C cable. If they are not connected via the cable, the communication error occurs.



Fig. 4-12-39. Communication error

It is required to turn ON and OFF the power to the controller when the option setting is written to the controller.

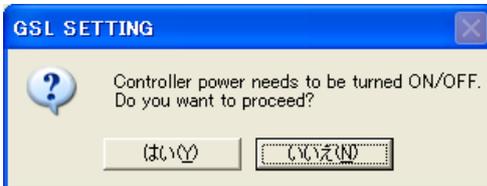


Fig. 4-12-40. Power ON/OFF check

Password is required to write to the controller. (Password: 2003) If your password is incorrect, you are not permitted to write to the controller.



Fig. 4-12-41. Password check

Operation ready is forcibly turned OFF after checking the password.

Select "Yes" when the operation ready is allowed to be turned OFF. If the operation ready is not turned OFF, you are not permitted to write.



Fig. 4-12-42. Operation ready OFF check

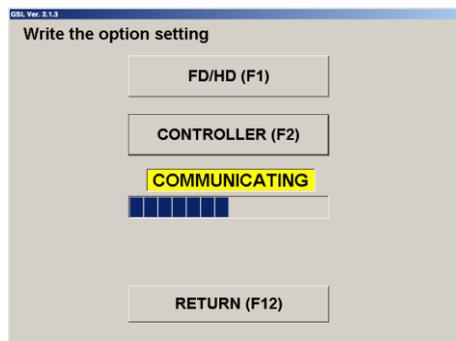


Fig. 4-12-43. Progress of writing to the controller

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

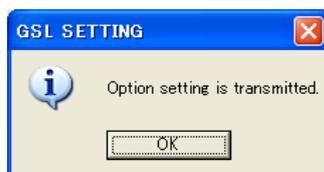


Fig. 4-12-44. Message for successful completion of writing the data to the controller

It is required to turn ON and OFF the power to the controller after writing.

Turn ON and OFF the power to the controller following the message.

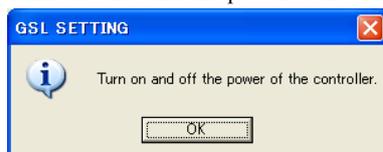


Fig.4-12-45. Controller power ON and OFF

Checks the communication after turning the power ON and OFF.



Fig. 4-12-46. Communication check confirmation

When an error occurred in the communication check, the error message appears.

Select "Yes" to retry.



Fig. 4-12-47. Communication check error

## 5. AUTO MEASUREMENT

The AUTO MEASUREMENT screen provides the auto measurement options.

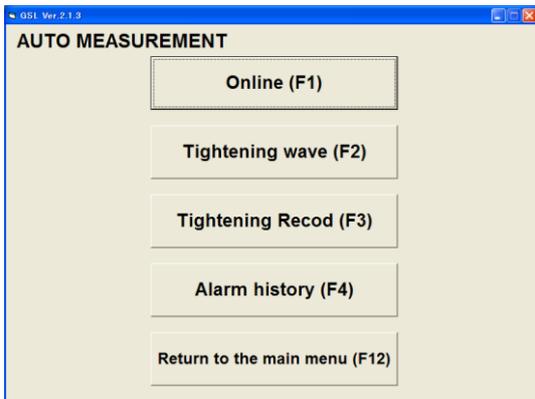


Fig. 5-1. Auto measurement options

- ONLINE  
Displays the ON LINE screen.  
Also it automatically saves the online information and zero magnification information.
- TIGHTENING WAVE  
Displays the TIGHTENING WAVE screen.  
Also it automatically saves the elongation waveforms and zero magnification information.
- TIGHTENING RECORD  
Displays the TIGHTENING RECORD screen.
- ALARM HISTORY  
Displays the ALARM HISTORY screen.
- RETURN TO MAIN MENU  
Returns to the MAIN MENU.



## 5-2. Using the TIGHTENING WAVE key

When the TIGHTENING WAVE key is clicked, the tightening waveform is displayed.

Tightening waveform can be read manually from the controller. The read waveform data can be manually stored in a file.

It is also possible to read the stored waveform data and display the waveform.

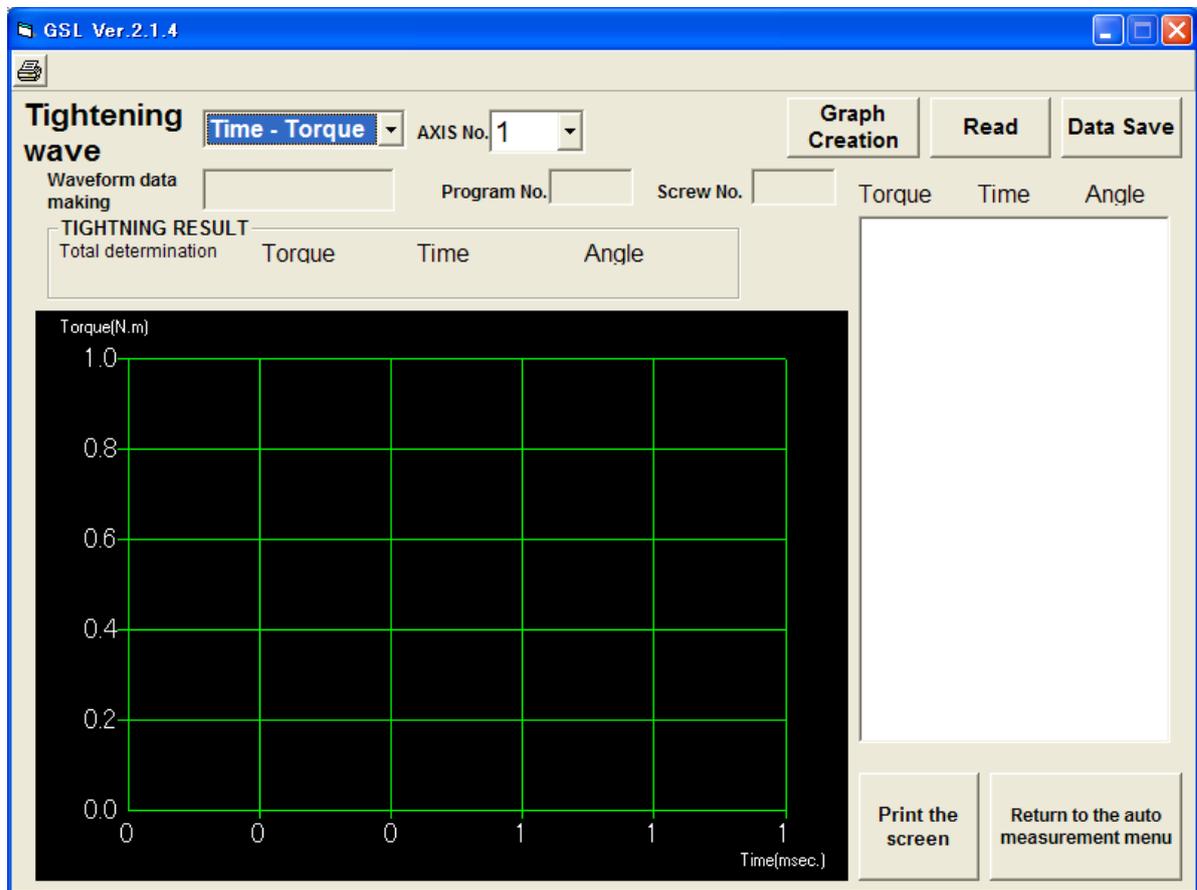


Fig. 5-4. TIGHTENING WAVE screen



Print : Prints out the current screen as it is.

- Wave Mode  
Displays a graph for time vs. angle, time vs. torque, or angle vs. torque.
- Axis No.  
Enter the axis number for which the tightening waveform information is being obtained.
- Time of Tightening Data  
Displays the time and date when the tightening waveform information was obtained.
- Program No.  
Displays the program number for which the tightening waveform information was obtained.
- Screw No.  
Displays the screw number for which the tightening waveform information was obtained.
- Tightening Result  
Displays information on general evaluation result, torque, time, and angle.
- Graph Creation button  
Creates a tightening result graph.

- Data Save button  
Saves the waveform data loaded from the controller to a file.
- Read button  
Loads the tightening waveform data for the specified axis number from the controller. This also allows you to load waveform data from the saved file.
- Data Display  
Numerically displays the tightening result information.  
Select the displayed tightening result and then click the Graph Creation button. A graph will be created in an arbitrary data range.
- Graph Display  
Displays a graph from the tightening result information.
- Print button  
Prints out the currently displayed screen.
- Return to AUTO MEASUREMENT screen  
Returns to the AUTO MEASUREMENT screen.



#### 5-4. Using the ALARM HISTORY button

When the ALARM HISTORY button is clicked, the alarm history is displayed.

The displayed ALARM HISTORY screen allows you to save the displayed alarm history to a file.

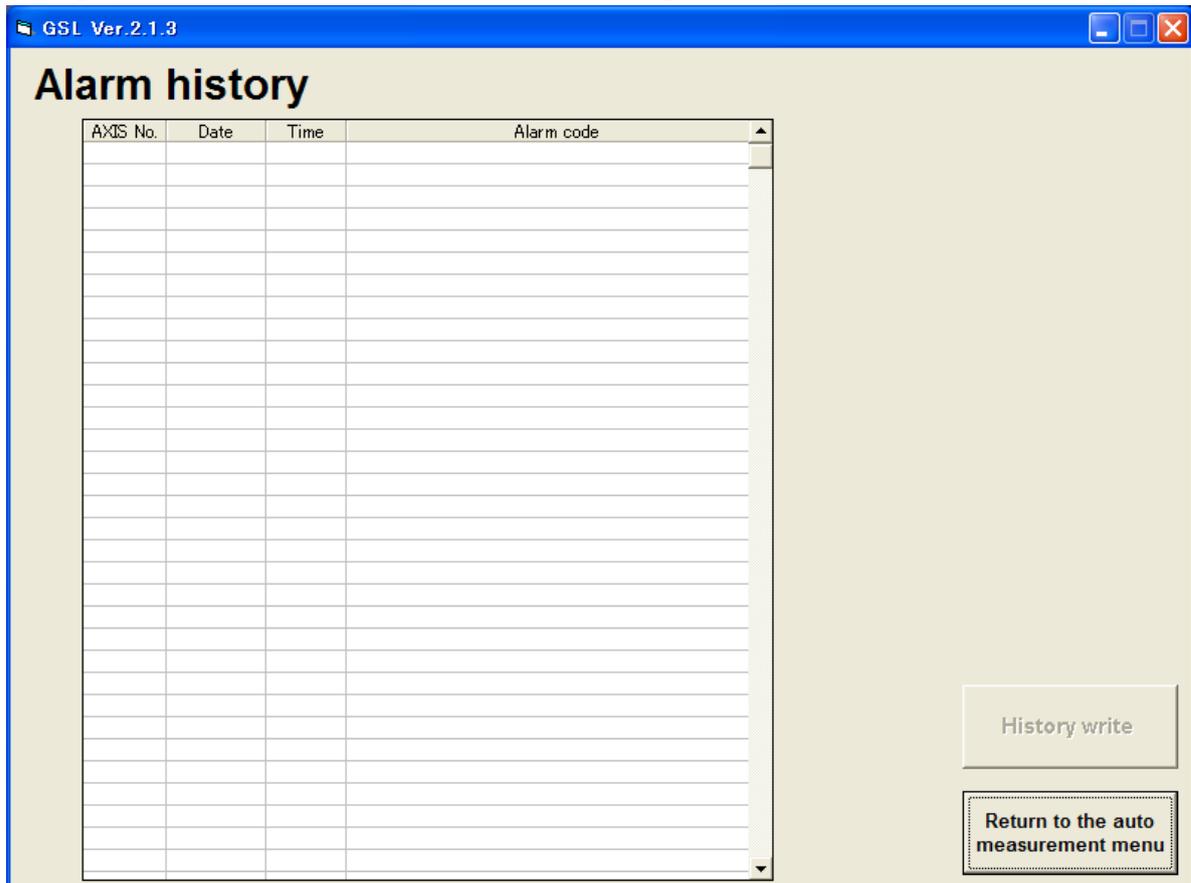


Fig. 5-6. ALARM HISTORY screen

- History Write  
Saves the displayed history information to a file.
- Return to AUTO MEASUREMENT screen  
Returns to the AUTO MEASUREMENT screen.

## 6. QUALITY CONTROL

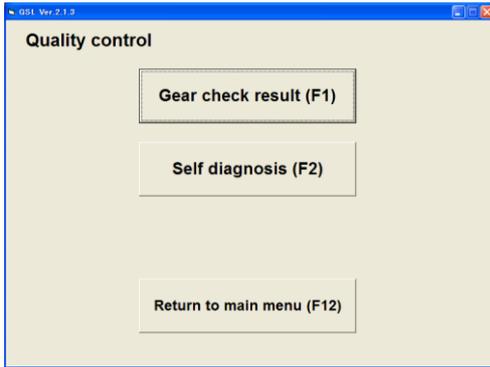


Fig. 6-1. QUALITY CONTROL menu

- Gear check result  
Displays the gear result.
- Self diagnosis  
Displays the versions of the personal computer, IF unit, controller and display.  
Also checks whether all versions of controllers are same or not.
- Return to MAIN MENU  
Returns to the MAIN MENU.

### 6-1. Gear check result

Displays the gear.

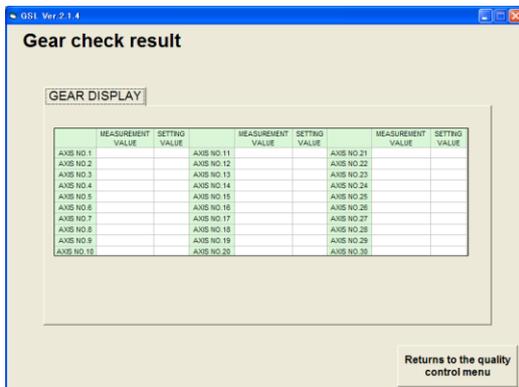


Fig. 6-2. Gear display

- Gear display  
Displays the measurement value and set value of each axis.
- Return to QUALITY CONTROL screen  
Returns to the QUALITY CONTROL screen.

## 6-2. Self diagnosis

Displays the versions of the personal computer, IF unit, controller and display.  
Also checks whether all versions of controllers are same or not.

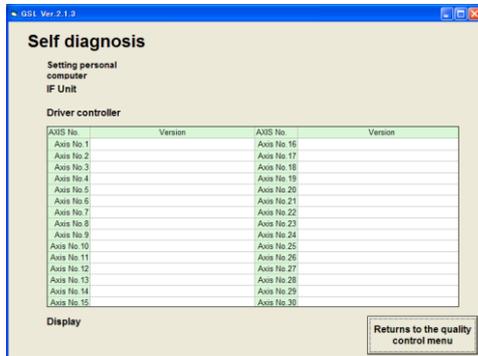


Fig. 6-3. Self diagnosis

- Return to QUALITY CONTROL screen  
Returns to the QUALITY CONTROL screen.

## 7. PRINT

The PRINT screen is shown below:

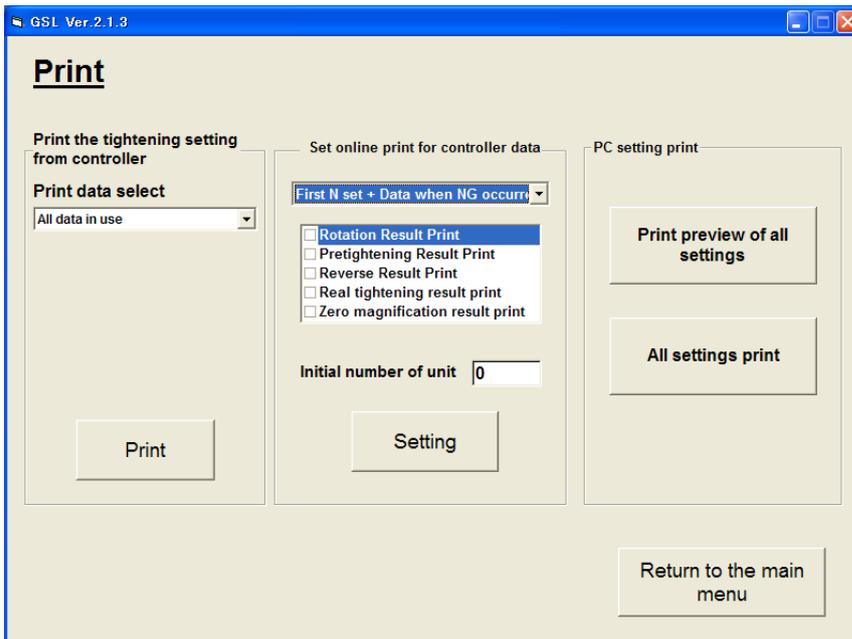


Fig. 7-1. PRINT screen

- **Print Tightening Settings from Controller**  
Prints out tightening settings from the printer connected to the controller.
- **Print Data Select**  
From Print Data Select, the following items may be selected:
  - All settings used
  - Program (1 to 24)
  - Rotation settings (1 to 24)
  - Pretightening settings (1 to 24)
  - Reverse rotation settings (1 to 24)
  - Final tightening settings (1 to 24)
  - Rating settings (1 to 30)
  - Axis arrangement settings (1 to 24)
  - Final data on tightening (1 to 7)
- **Number Select**  
Enter the setting number you want to print out or the axis number.  
When any option other than the “All Settings Used” option is selected from Print Data Select, the selected settings are displayed on the screen.
- **Print button**  
Prints out the data in accordance with the settings in Print Data Select and Number Select.
- **Set Online Print for Controller Data**  
Allows you to set the controller to print out data.
- **Print Mode Select**  
Allows you to select any of the following options.
  - No Auto Print
  - After Each Tightening
  - When Rejection Occurs
  - When Rejection Occurs After Initial N UnitsWhen the “No Auto Print” option is selected, Result Print Select and Initial Number of Units are not displayed.

- Result Print Select

Allows you to select any of the following options:

- Rotation Result Print

- Pretightening Result Print

- Reverse Rotation Result Print

- Final Tightening Result Print

- Zero Magnification Result Print

- Initial Number of Units

Enter the initial number of units.

Initial Number of Units is only displayed when the print mode is “When Rejection Occurs After Initial N Units”.

- PC Setting Print

Prints out settings from the personal computer.

- Print Preview of All Settings

Displays a print preview of all the settings.

- All Settings Print

Prints out all the settings.

## 8. I/O MONITOR

The I/O MONITOR screen is displayed below:

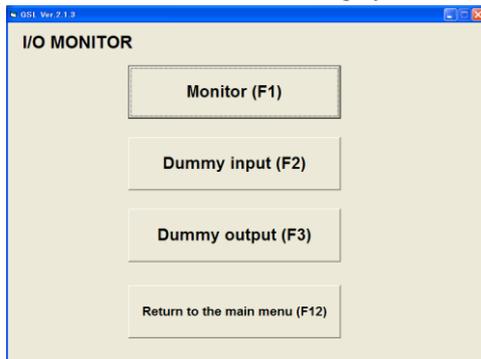


Fig. 8-1. I/O MONITOR screen

- MONITOR  
Displays the monitor screen.
- DUMMY INPUT  
Displays the DUMMY INPUT screen.
- DUMMY OUTPUT  
Displays the DUMMY OUTPUT screen.
- RETURN TO MAIN MENU  
Returns to the MAIN MENU.

## 8-1. Using the MONITOR button

When the MONITOR button is clicked, the input/output of the controller will be monitored.

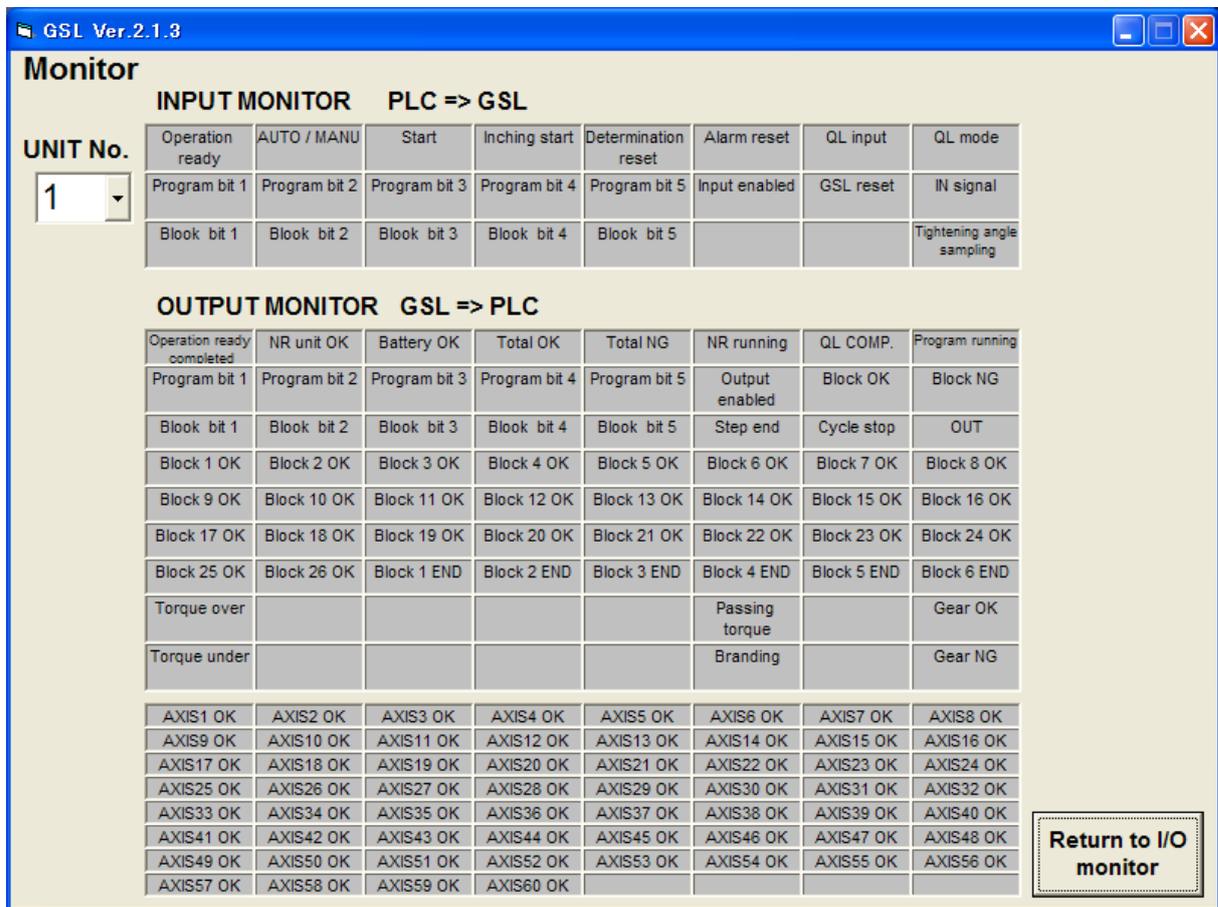


Fig. 8-2. Monitor screen

- Unit No.  
Specify the unit number to be monitored.
- Input Monitor  
Allows you to monitor the input to the controller.
- Output Monitor  
Allows you to monitor the output from the controller.
- Return to I/O MONITOR screen  
Returns to the I/O MONITOR screen.

## 8-2. Using the DUMMY INPUT button

When the DUMMY INPUT button is clicked, the dummy input is provided.

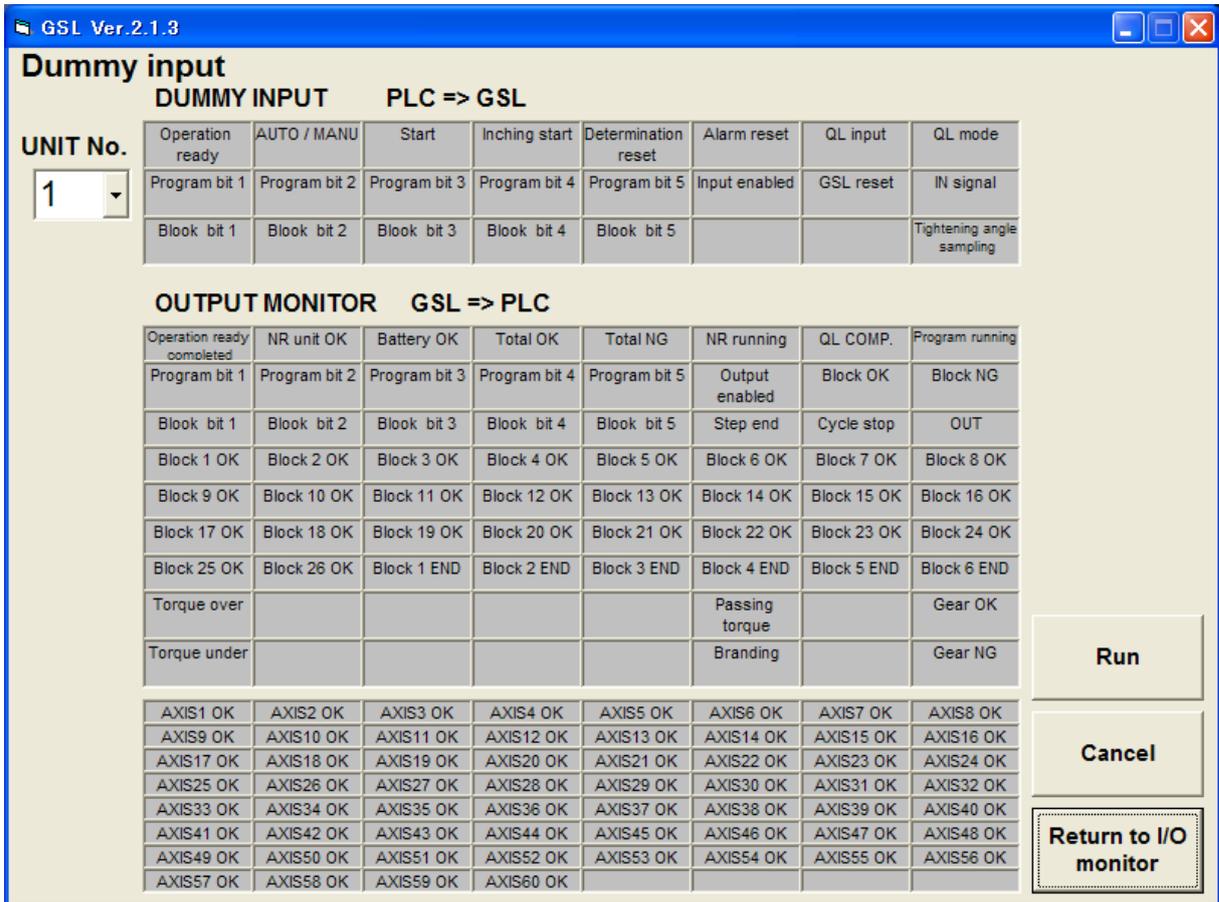


Fig. 8-3. DUMMY INPUT screen

- Unit No.  
Select the unit number for which you want to provide the dummy input.
- Dummy input  
Click the signals you want to select for the dummy input.  
Multiple signals may be selected.  
When the Run button is clicked, the dummy input will be started.
- Output monitor  
Allows you to monitor the output from the controller.
- Run button  
Sends the selected signals for the dummy input to the controller.  
This requires previously entering your password. (Password: 2003)
- Cancel button  
Cancels the selected signals for the dummy input.
- Returns to I/O MONITOR screen  
Returns to the I/O MONITOR screen.

### 8-3. Using the DUMMY OUTPUT button

When the DUMMY OUTPUT button is clicked, the dummy output is provided.

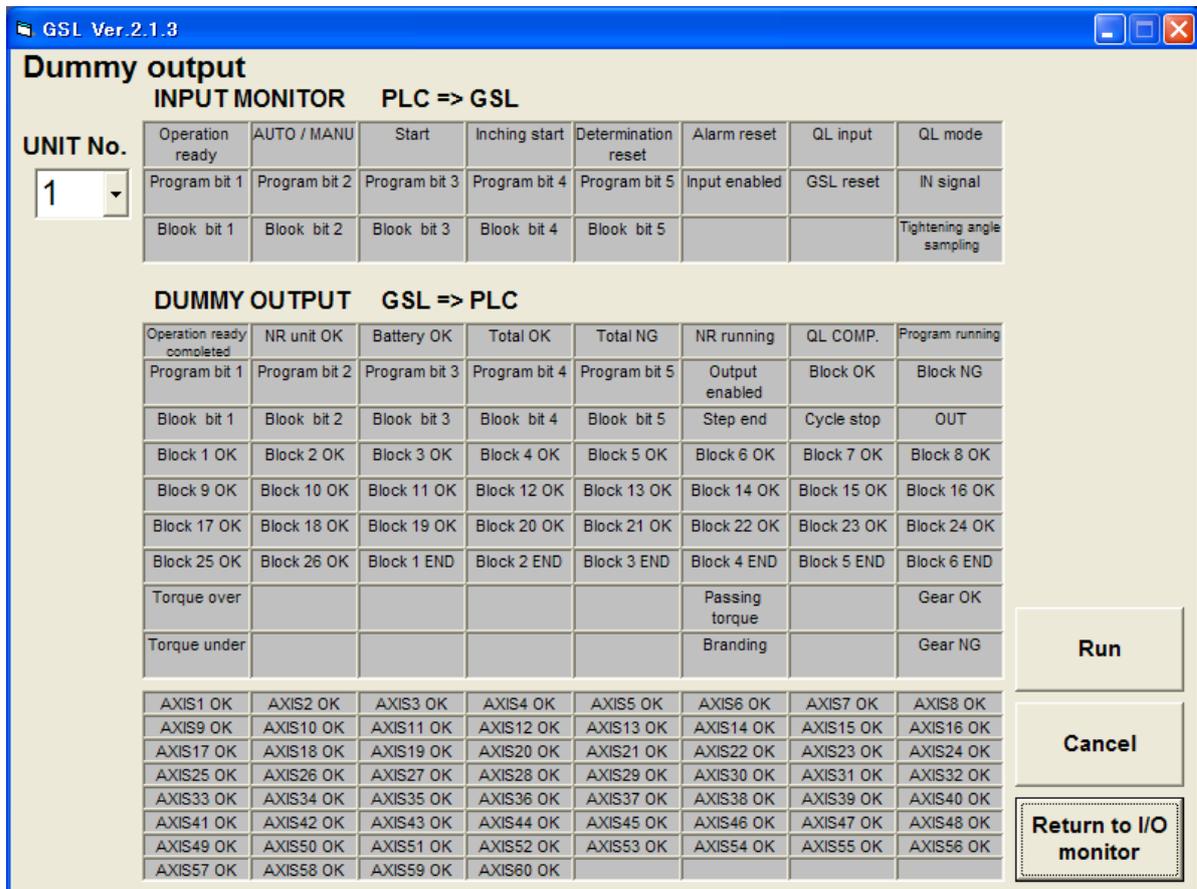


Fig. 8-4. DUMMY OUTPUT screen

- Unit No.  
Select the unit number for which you want to provide the dummy output.
- Input monitor  
Allows you to monitor the output from the controller.
- Dummy output  
Click the signals you want to select for the dummy output.  
Multiple signals may be selected.  
When the Run button is clicked, the dummy output will be started.
- Run button  
Sends the selected signals for the dummy output the controller. This requires previously entering your password.  
(Password: 2003)
- Cancel button  
Cancels the selected signals for the dummy input.
- Returns to I/O MONITOR screen  
Returns to the I/O MONITOR screen.

## Glossary

### UNIT:

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

### PROGRAM:

Screw tightening program can form the program from 1 to 24 on each axis. One program begins with the control flag (Zero magnification check is performed or not, etc.) and rating setting, and it is possible to set operation to maximum 50 steps. However, the end is treated as one step. At least one block should have been set in the program.

### BLOCK:

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

### STEP:

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

### QL INPUT:

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

### RETRY:

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

**ROTATION:**

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

**PRETIGHTENING:**

Operation to perform temporary tightening until a screw seats.

**REVERSE ROTATION:**

Operation to unfasten the seated screw by several turns. It is possible to determine the screw baking by monitoring the residual torque during this tightening operation.

**FINAL TIGHTENING:**

Final tightening operation of screws.

**APPLICABLE TO ID CONTROLLERS:**

It is possible to transfer the engine number, set the calendar and transmit the result data by connecting the interface unit and ID controller via serial communication. (Exclusive use with a printer.)

**APPLICABLE TO PRINTERS:**

Connects with a printer through Centronics interface. Setting data and tightening result can be printed. (Exclusive use with a QC personal computer and ID controller.)

**TIGHTENING ANGLE SAMPLING OPERATION:**

Operation to rotate the screw in the tightening direction at a constant speed and then stop when it reaches the preset torque, in order to measure the screw length. This operation allows you to easily set the tightening program. (Executable only from a personal computer.)

## Revised Contents

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