

OPERATION MANUAL

Professional tool

delvo

Screw Fastening Monitor Software

- Please read the manual carefully before you attempt to operate this software so that you may use it properly.
- For operation of the screw fastening monitor, refer to the instruction manual that is provided with the screw fastening monitor.

Manufactured by

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Instructions

Thank you very much for your purchase of this NITTO KOHKI product.

Before operating the software, please read this manual carefully so that you may use it properly to get the most out of it.

The following safety notations are used throughout the manual to highlight important information for the user.



WARNING: Indicates instructions that must be followed when operating the software.



CAUTION: Indicates information that must be paid attention to when operating the software.

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Precautions

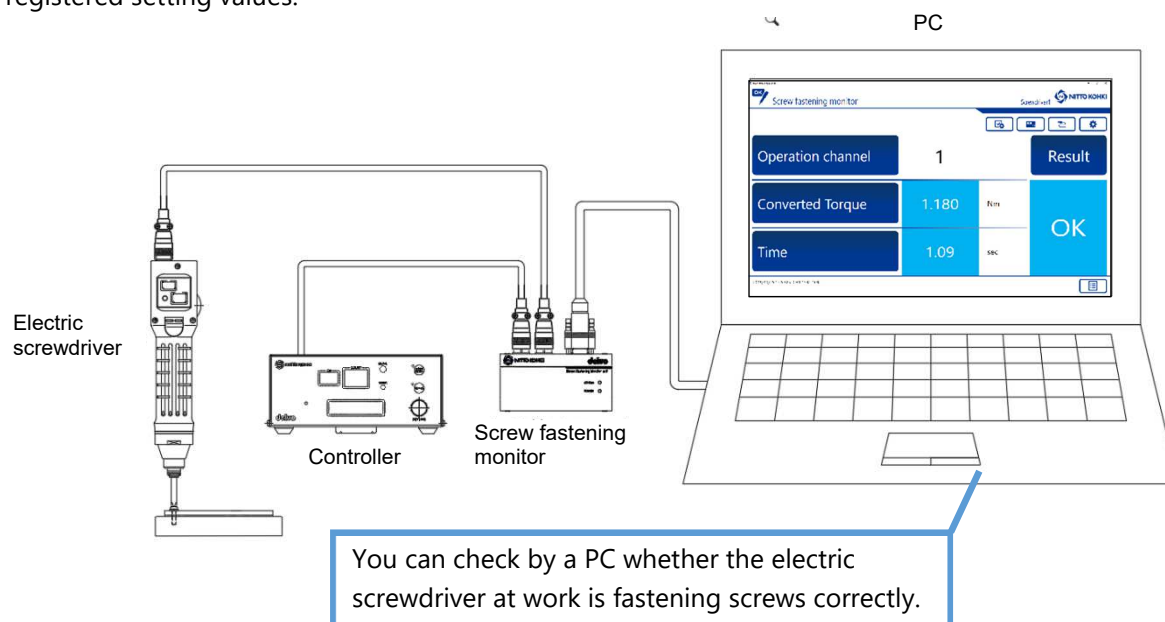
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1. Overview of Software

Main functions

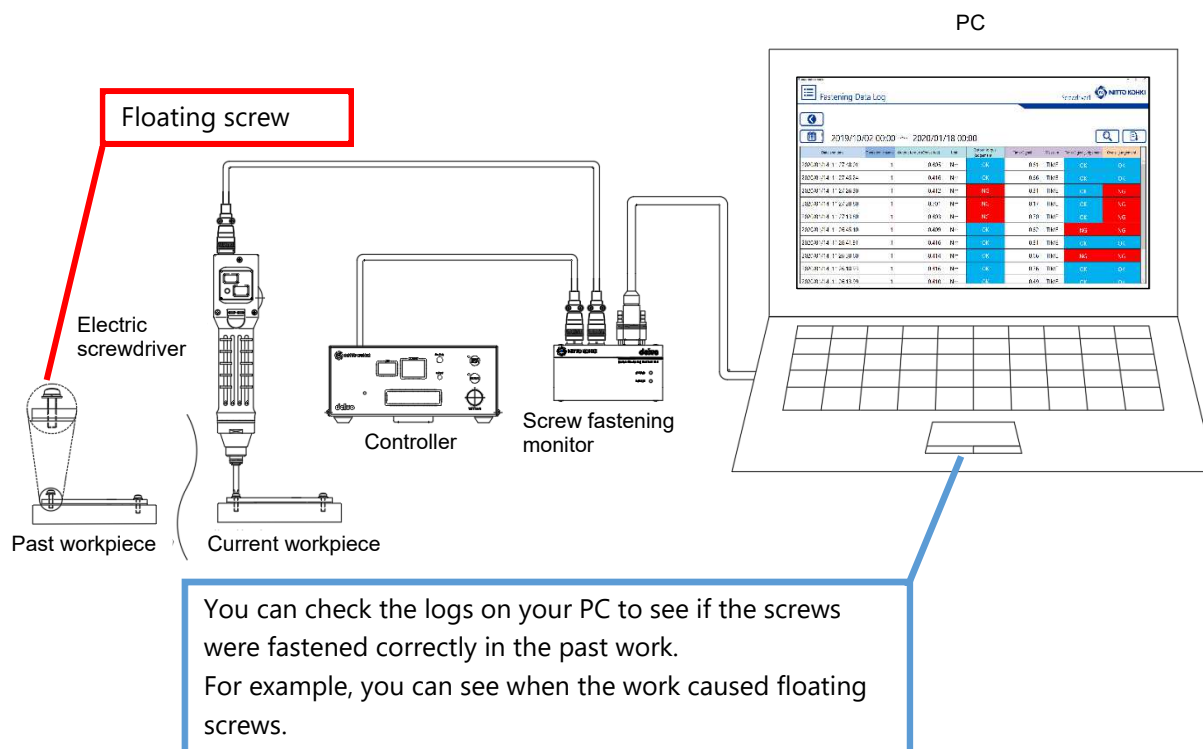
Judging screw fastening

This product judges whether the screw fastening has been correctly performed by the electric screwdriver, based on the pre-registered setting values.



Checking the fastening data log

You can check whether the screws were fastened correctly in the past work.



Operating environment

Operating system

Windows 7 (32-bit/64-bit)

- Microsoft .NET Framework 4 must be installed.

Windows 10 (32-bit/64-bit)

Compatible models

Screw fastening monitor

For details on electric screwdrivers and controllers that can be connected to the screw fastening monitor, refer to the instruction manual for the screw fastening monitor.

Communication settings

Model	DTM10	DTM45
Transmission speed	38400 bps	19200 bps
Number of data	8 bits	
Parity	None	
Stop bit	1 bit	



Communication content

Operation channel	A unit with which screw fastening is performed continuously under the same conditions, such as the screw fastening torque, rotational speed, and number of fastening screws ● For details, refer to the instruction manual for the current control type electric screwdriver.
Converted current value	Motor current value at torque up converted to a value between 0 to 4095
Time	Time from the start of the electric screwdriver rotation until torque up (0 to 9990 msec)
Rotation signal (DTM45 only)	Signal from the start of the electric screwdriver rotation until torque up (0 to 60000)

Torque checker

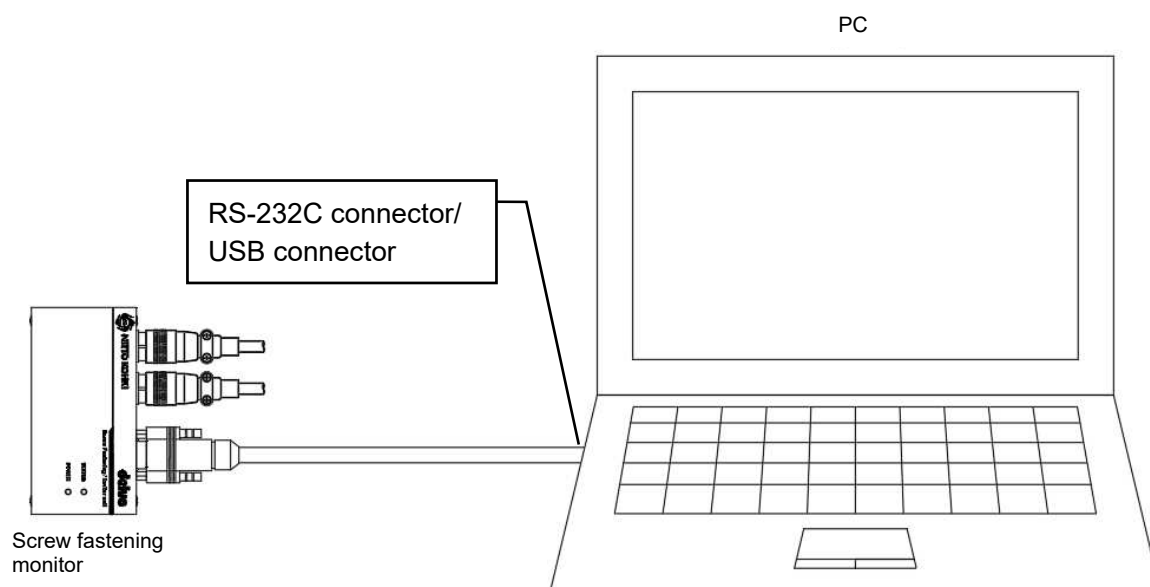
Model	DLT1133A DLT1173A	DLT1633A DLT1673A	DLT1933A DLT1973A
Measuring range (Nm [lbf·in])	0.015 to 1.500 [0.13 to 13.3]	0.15 to 10.00 [13.5 to 88.5]	4.00 to 12.00 [35.4 to 106.2]
Transmission speed	19200 bps		
Number of data	8 bits		
Parity	None		
Stop bit	2 bits		
Handshake	None		



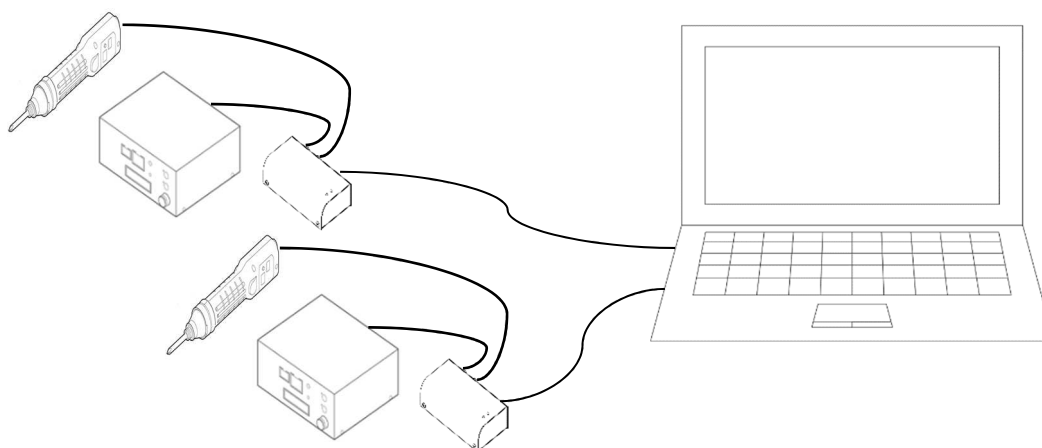
2. Preparation

Connecting the screw fastening monitor to a PC

- 1 Connect the RS-232C connector or USB connector on the PC to the RS-232C connector on the screw fastening monitor with a communication cable.

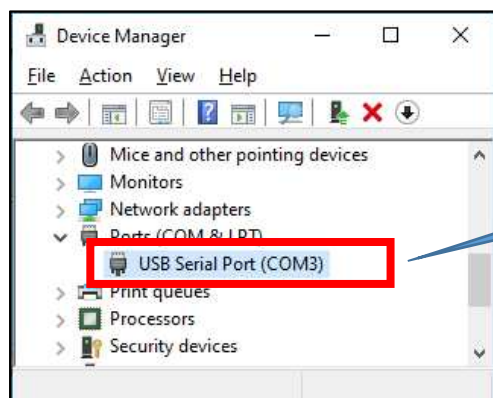


Two or more screw fastening monitors also can be connected to a single PC.



2 When using an RS-232C/USB conversion cable, install the device driver as required.

After installing the device driver, check the port No. (COM*) by selecting [Control Panel] → [Device Manager]. When two or more screw fastening monitors are connected, check each of their port Nos.



Check the port No. (COM*).

⚠ CAUTION

- For details on how to install the device driver, refer to the Instruction Manual of the purchased product or on the manufacturer's web site.
- If a communication defect occurs or the port cannot be recognized during use of the communication cable, contact the manufacturer of the purchased product.

Downloading and starting up the software

1 Access the following URL, and download the zip file.
<https://www.nitto-kohki.co.jp/e/prd/delvo/>

2 Decompress the zip file using decompression software.

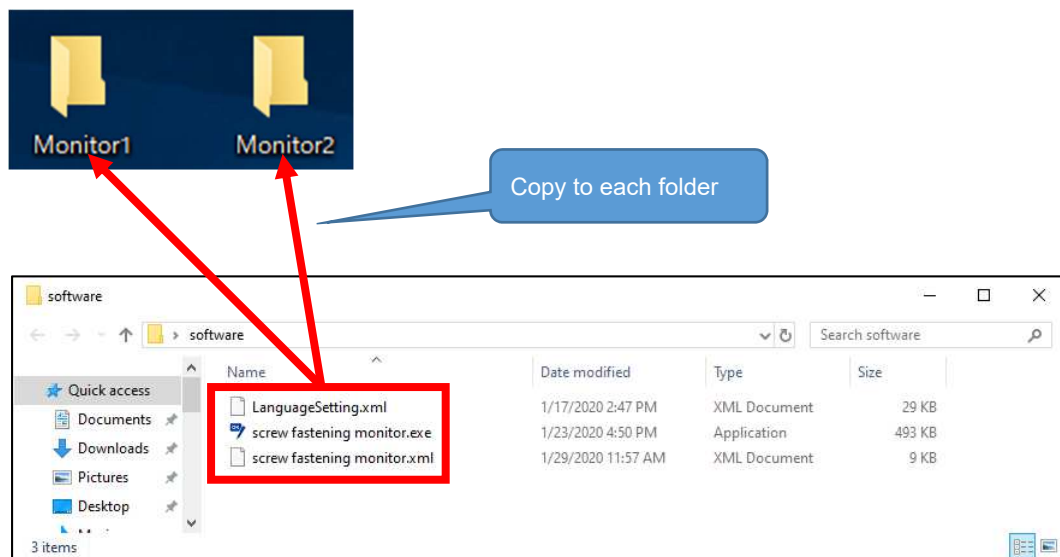
After the zip file is decompressed, check that the following files have been created.

File name	Details
screw fastening monitor.exe	Software program
screw fastening monitor.xml	Files required for starting up the software
LanguageSetting.xml	

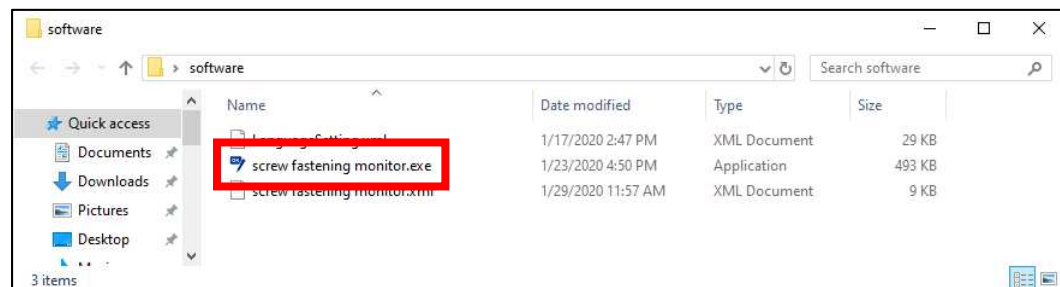
The software does not need to be installed on the PC.

Place “screw fastening monitor.exe”, “screw fastening monitor.xml”, and “LanguageSetting.xml” in the same folder.

When two or more screw fastening monitors are connected, create folders for the number of connected monitors, and place these three files in each of the folders.



3 Double click “screw fastening monitor.exe”.



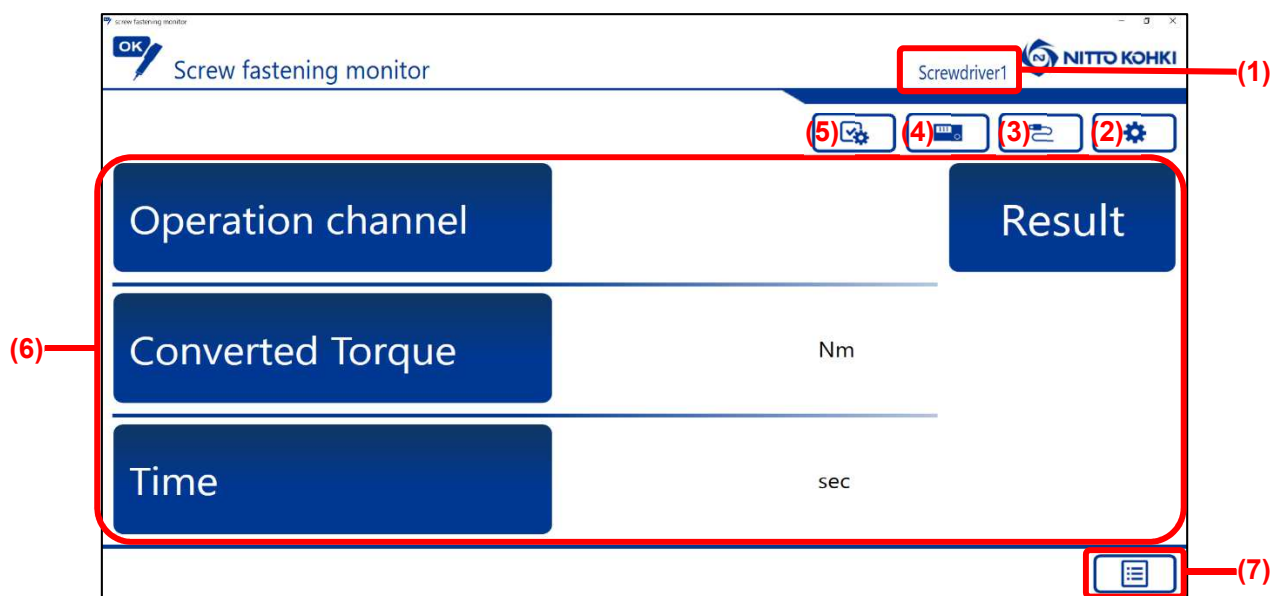
When two or more screw fastening monitors are connected, double click “screw fastening monitor.exe” in the respective folder.






The software starts up.

3. Setting

When the software starts up, the [Screw fastening monitor] screen (main screen) is displayed.

Configuration of main screen







No.	Name	Details	Reference
(1)	Device name	The name of the screw fastening monitor set in the [System Setting] screen is displayed.	p. 12
(2)	 System setting button	Displays the [System Setting] screen.	p. 11
(3)	 Communication setting button	Displays the [Communication setting] screen.	p. 24
(4)	 Torque conversion factor measurement button	Displays the [Torque conversion] screen.	p. 29
(5)	 Judgment value setting button	Displays the [Judgment value setting] screen.	p. 39
(6)	Judgment result	Displays the result of fastening judgment.	p. 42
(7)	 Fastening data log button	Moves to the [Fastening Data Log] screen.	p. 44

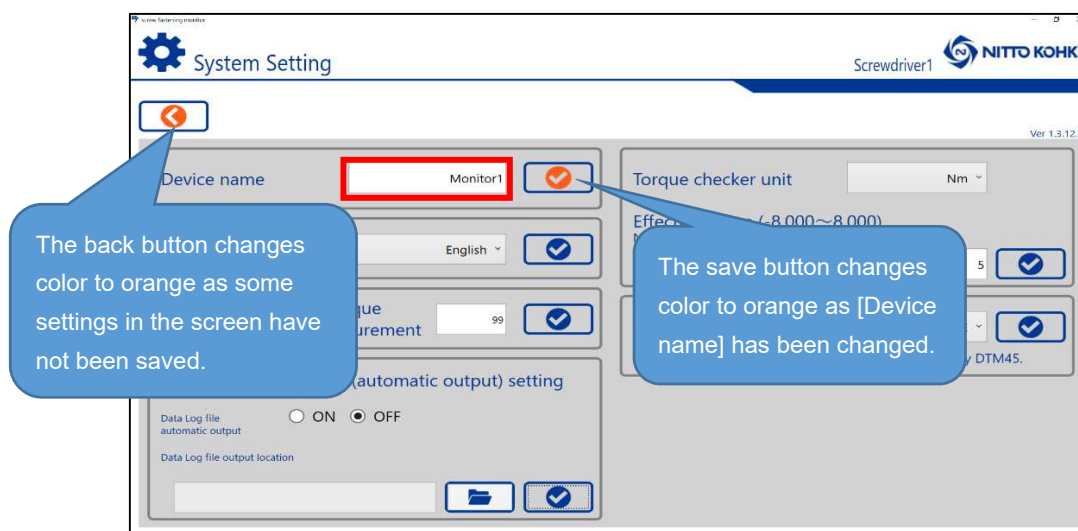
Make the initial settings in order (2) to (5).


Setting screen buttons

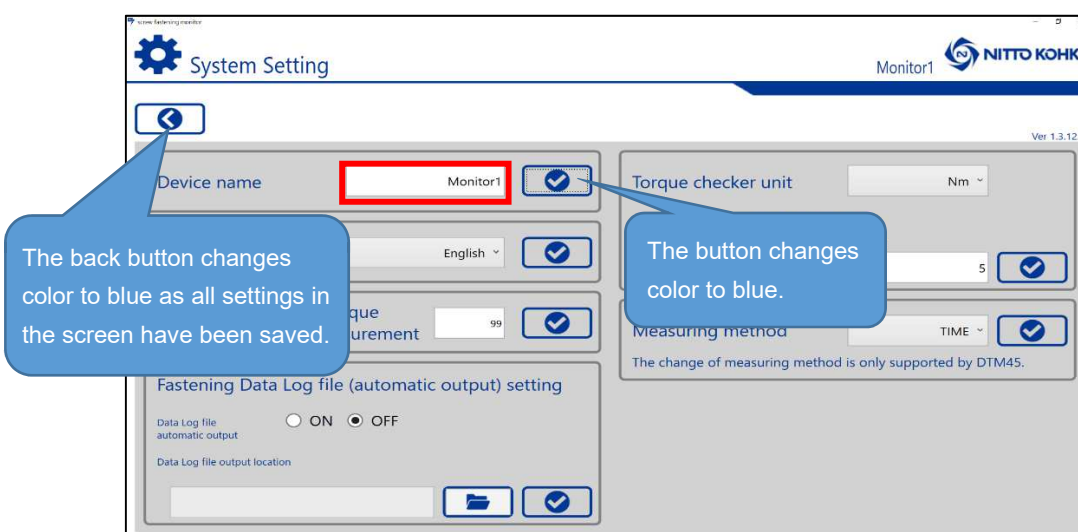
Two buttons are located in each setting screen, and these buttons change color depending on the saved state of the setting.

Button name	Display	State
Save button		Setting has not been changed or is already saved.
		Setting has been changed but not saved. Clicking this button saves the setting.
Back button		All settings in the screen are already saved. Clicking this button returns to the main screen.
		One of the settings in the screen is not saved. Clicking this button displays a confirmation message asking whether or not to discard the settings.


- When [Device name] is changed in the [System Setting] screen

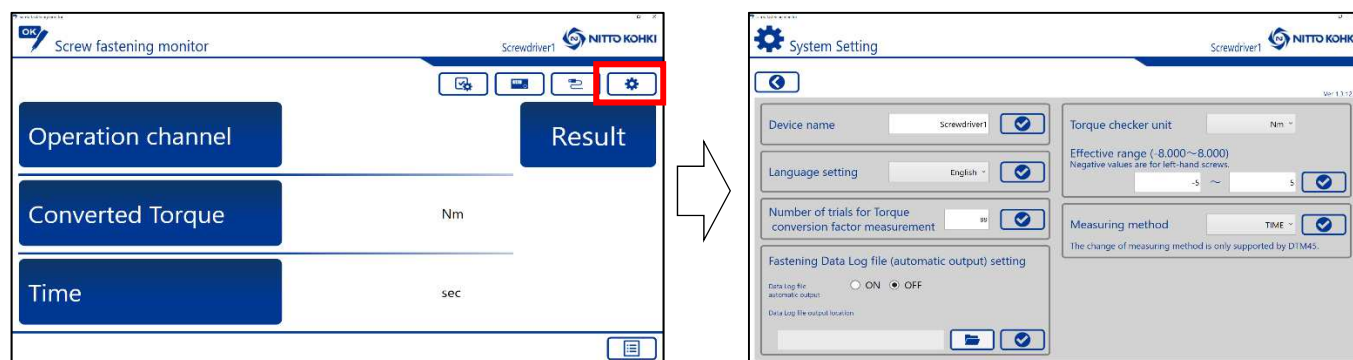


Click .



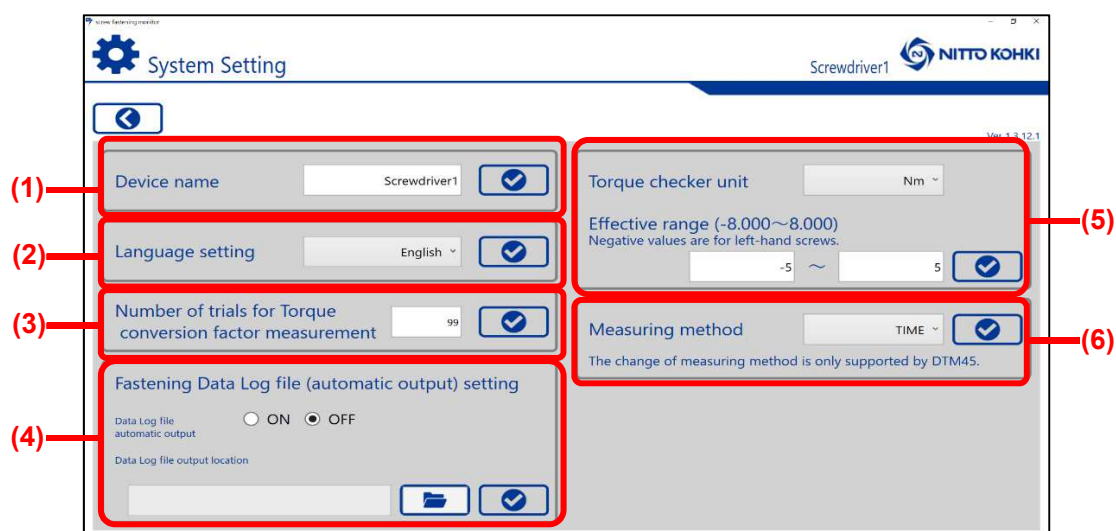
System setting

When  in the main screen is clicked, the [System Setting] screen is displayed.



Configuration of [System Setting] screen

In the [System Setting] screen, set the name of the screw fastening monitor and other system-related settings.



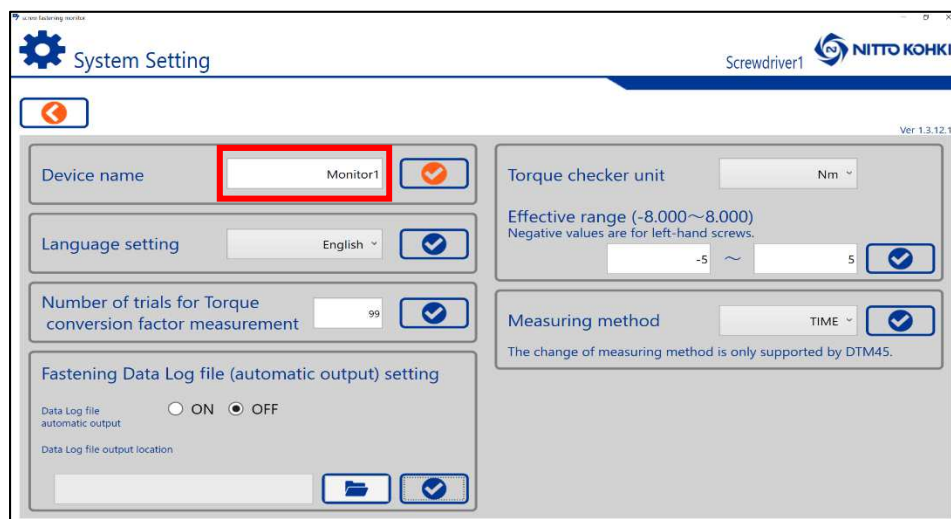
No.	Name	Details	Reference
(1)	Device name	Sets the name of the currently connected screw fastening monitor.	p. 12
(2)	Language setting	Sets the software display language.	p. 14
(3)	Number of trials for Torque conversion factor measurement	Sets the measurement count for the output torque to calculate the torque conversion factor.	p. 15
(4)	Fastening Data Log file (automatic output) setting	Sets automatic output of the fastening data log file and its output destination.	p. 17
(5)	Torque checker unit	Sets the unit and effective range of the output torque values used by the software.	p. 19
(6)	Measuring method	Sets the measurement method of values used in fastening judgment when the DTM45 is connected.	p. 22

Setting the name of screw fastening monitor

Set the name of the screw fastening monitor currently connected to the PC.

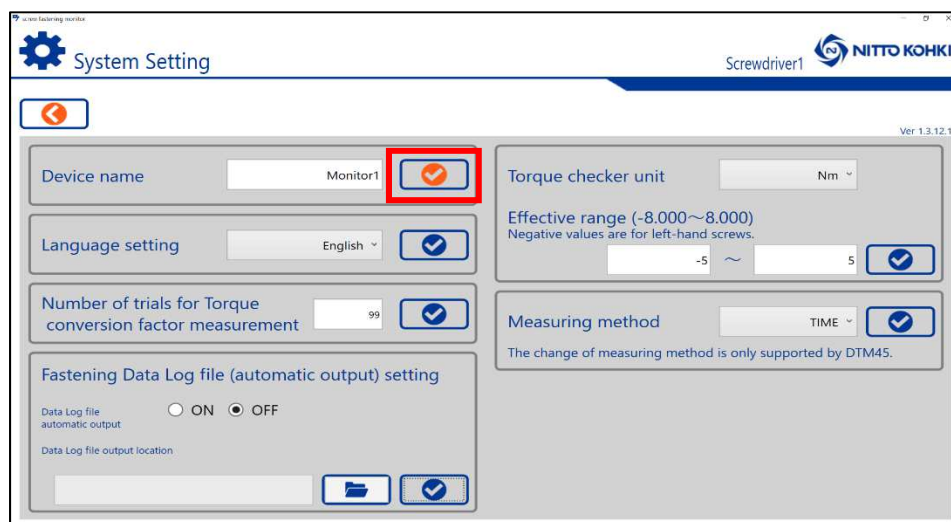
When two or more screw fastening monitors are connected, which screw fastening monitor the started up software corresponds to can be made clear by assigning a name and No. for identification to each of the screw fastening monitors.

1 Enter the name of the screw fastening monitor in the [Device name] field.



The screenshot shows the 'System Setting' window for 'Screwdriver1' (NITTO KOHKI). The 'Device name' field is highlighted with a red box and contains the text 'Monitor1'. Other settings visible include 'Language setting' (English), 'Number of trials for Torque conversion factor measurement' (99), 'Fastening Data Log file (automatic output) setting' (OFF), 'Torque checker unit' (Nm), 'Effective range (-8.000~8.000)', and 'Measuring method' (TIME).

2 Click the save button.



The screenshot shows the same 'System Setting' window. The save button, represented by a blue circle with a white checkmark, is highlighted with a red box. The 'Device name' field still contains 'Monitor1'.

The setting is saved, and the new name is displayed.

The screenshot shows the 'System Setting' window for a Nitto Kohki device. The window has a title bar with a gear icon and the text 'System Setting'. In the top right corner, there is a red rectangular box highlighting the text 'Monitor1'. Below the title bar, there is a navigation bar with a back arrow icon on the left and the text 'Monitor1' on the right. The main area of the window is divided into two columns. The left column contains settings for 'Device name' (set to 'Monitor1'), 'Language setting' (set to 'English'), 'Number of trials for Torque conversion factor measurement' (set to '99'), and 'Fastening Data Log file (automatic output) setting' (with 'Data Log file automatic output' set to 'OFF' and a file location field). The right column contains settings for 'Torque checker unit' (set to 'Nm'), 'Effective range (-8.000~8.000)' (with a range of '-5 ~ 5'), and 'Measuring method' (set to 'TIME'). Each setting has a confirmation button with a checkmark. The version 'Ver 1.3.12.1' is displayed in the top right corner.

System Setting

Monitor1

Ver 1.3.12.1

Device name: Monitor1

Language setting: English

Number of trials for Torque conversion factor measurement: 99

Fastening Data Log file (automatic output) setting

Data Log file automatic output: ☐ ON ☒ OFF

Data Log file output location: [Folder icon]

Torque checker unit: Nm

Effective range (-8.000~8.000)
Negative values are for left-hand screws.
-5 ~ 5

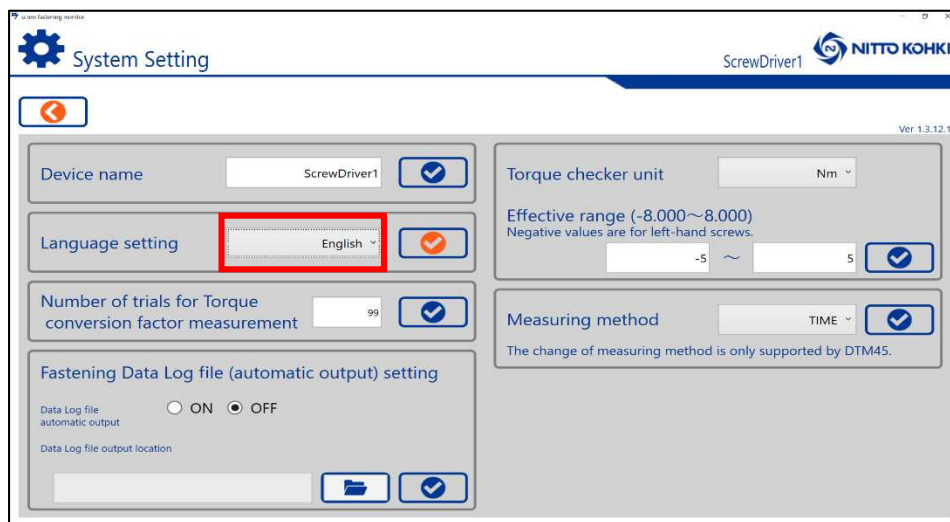
Measuring method: TIME

The change of measuring method is only supported by DTM45.

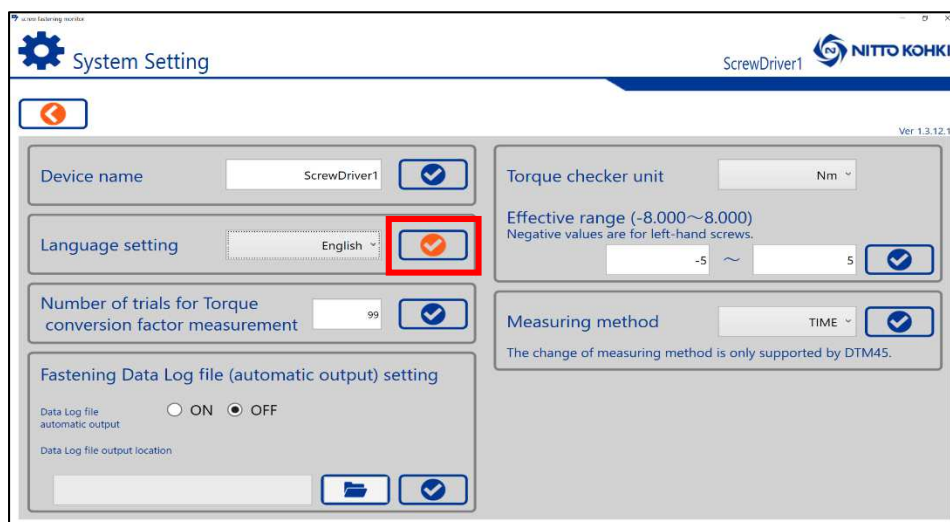
Setting the display language

Set the display language of the software.

1 Select the language in the [Language setting] pulldown menu.



2 Click the save button.



The setting is saved.

3 Restart the software.

The software starts up in the newly set language.

⚠ CAUTION

- **Always restart the software after the display language setting has been changed.**
Changes to the display language settings are not reflected in the software until it is restarted.

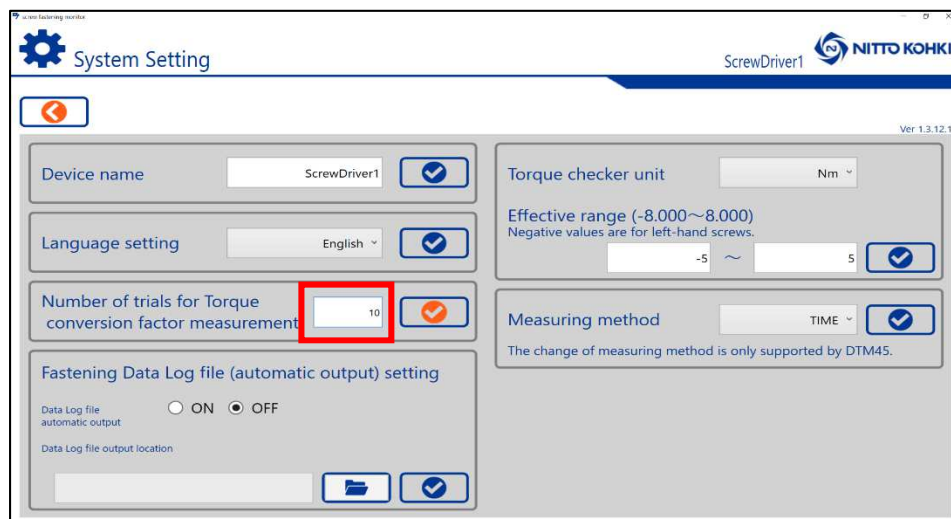
Setting the output torque measurement count for calculation of the torque conversion factor

Set the measurement count for the current conversion value and output torque of the electric screwdriver to calculate the torque conversion factor.

The newly set count is reflected in the [Torque conversion] screen. (For details on calculation of the torque conversion factor, refer to “Torque conversion” (p. 29).)

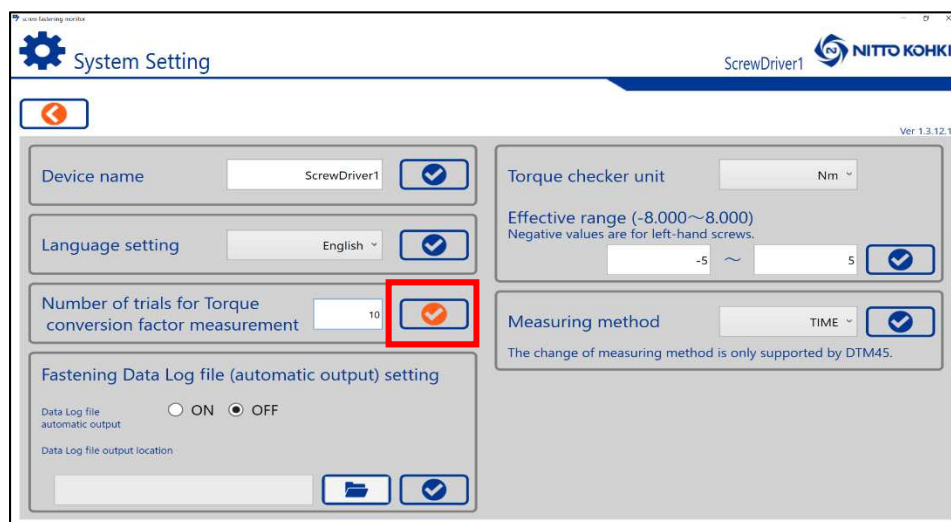
The default measurement count is [99].

- 1 Enter the measurement count in the [Number of trials for Torque conversion factor measurement] field.



The screenshot shows the 'System Setting' window for 'ScrewDriver1'. The 'Number of trials for Torque conversion factor measurement' field is highlighted with a red box and contains the value '10'. Other settings include 'Device name' (ScrewDriver1), 'Language setting' (English), 'Torque checker unit' (Nm), 'Effective range' (-8.000~8.000), 'Measuring method' (TIME), and 'Fastening Data Log file' (OFF).


- 2 Click the save button.






This screenshot is identical to the previous one, but the save button (a blue circle with a white checkmark) next to the 'Number of trials for Torque conversion factor measurement' field is highlighted with a red box.


The newly set count is reflected in the [Torque conversion] screen.

- When the [Number of trials for Torque conversion factor measurement] field is changed to [10]


Torque conversion ScrewDriver1 

Operation channel   

Measured date/time

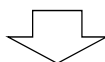
Number Measured Value (Torque Checker) Nm Current Value (Converted) 


Number	Measured Value (Torque Checker)	Current Value (Converted)
91		
92		
93		
94		
95		
96		
97		
98		
99		
Average		




T.C.factor* 

Output contents of Torque checker *T.C.factor:Torque conversion factor Output contents of Screw Fastening Monitor


Measurement count: 1 to 99 (default)




Torque conversion ScrewDriver1 

Operation channel   

Measured date/time

Number Measured Value (Torque Checker) Nm Current Value (Converted) 

Number	Measured Value (Torque Checker)	Current Value (Converted)
2		
3		
4		
5		
6		
7		
8		
9		
10		
Average		

T.C.factor* 

Output contents of Torque checker *T.C.factor:Torque conversion factor Output contents of Screw Fastening Monitor

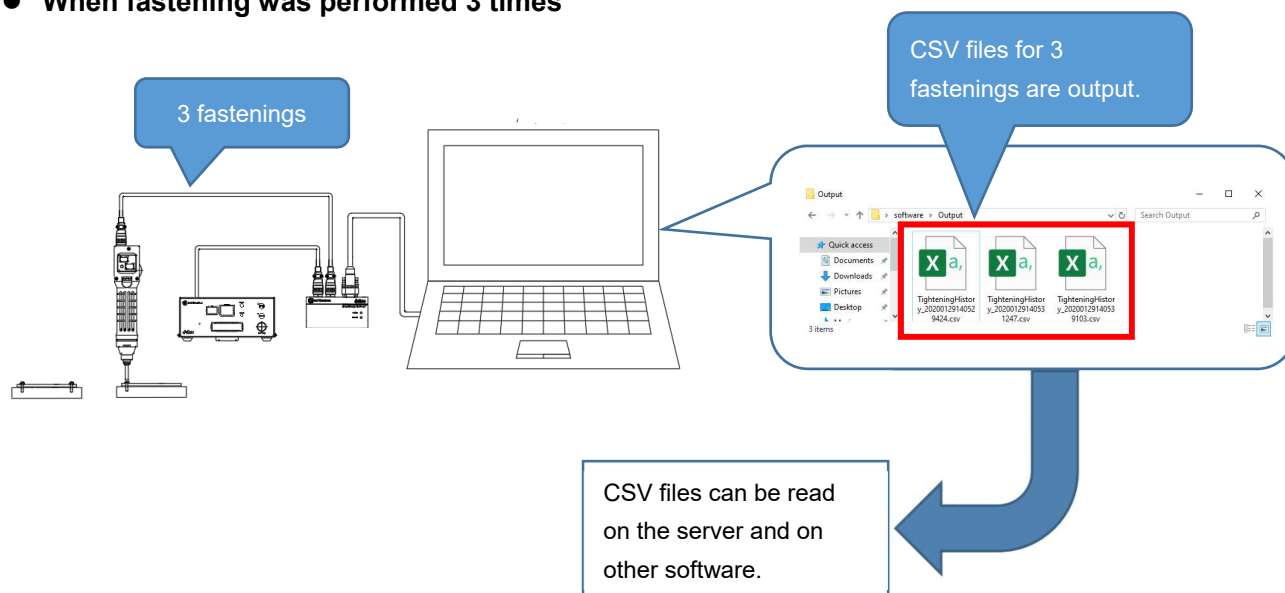
Measurement count: 1 to 10

Setting automatic output of fastening data log file

The result of fastening judgment can be set to be divided into CSV files for the number of fastenings and automatically output.

This function can be put to use to automatically send the judgment result data to the server or to use the judgment result data in other software.

● When fastening was performed 3 times



Content of CSV file

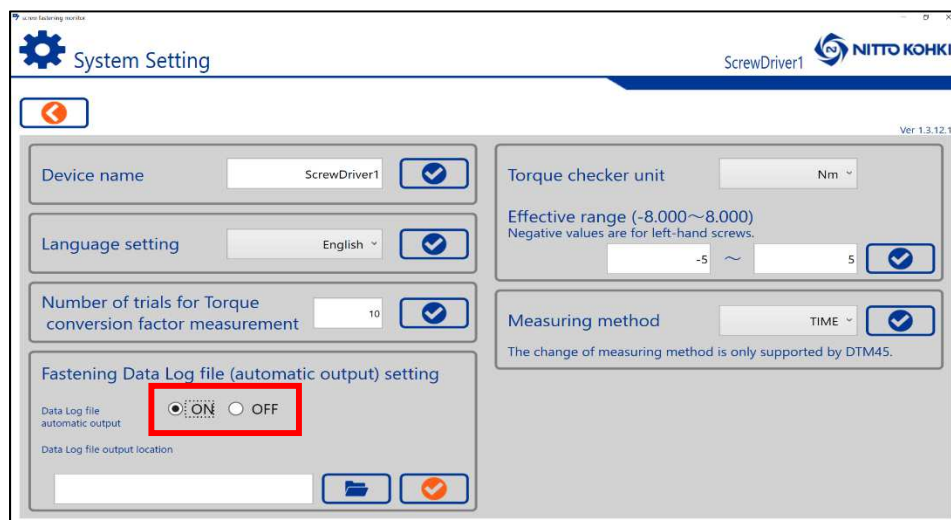
AutoSave OFF TighteningHistory_20200204112333928.csv - Excel

Date and time	Operation channel	Output torque (Converted)	Unit	Output torque judgement	Time/Signal Measure	Time/Signal judgement	Overall judgement
2/4/2020 11:23	1	0.211	Nm	OK	0.49 TIME	OK	OK

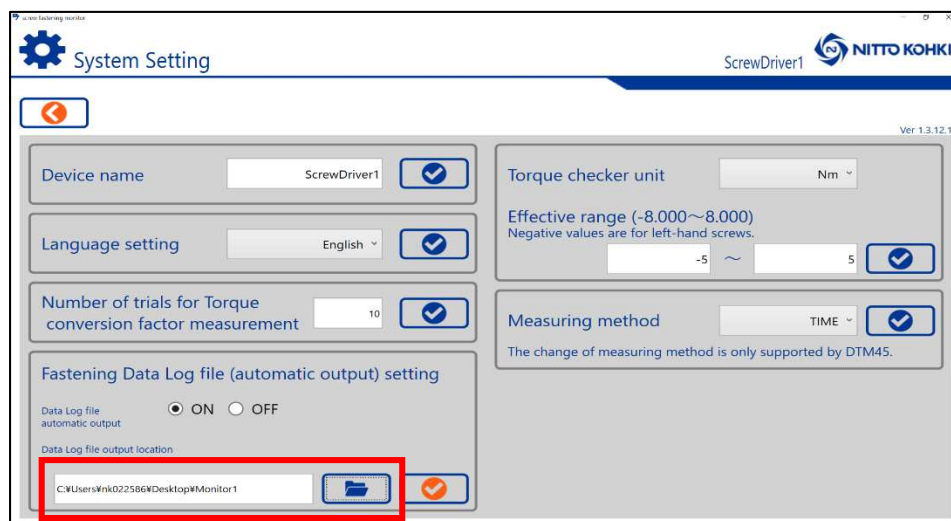
TighteningHistory_2020020411233

Data for 1 fastening

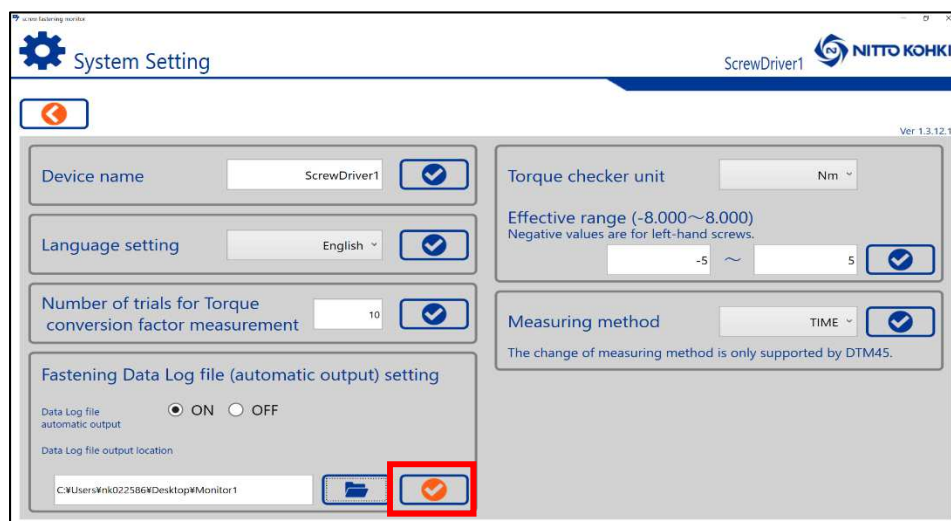
1 Set [Data Log file automatic output] to [ON].



2 Click at [Data Log file output location], and designate the CSV file output destination.



3 Click the save button.



Setting the unit and effective range of output torque values

Set the unit of “output torque (conversion value)” displayed in the main screen (p. 9) and the effective range and unit of the torque checker output data used in the [Torque conversion] screen (p. 29).

When the values of the torque checker output data are outside of the effective range or data of a different unit has been sent, measurement ends in error (p. 21).

⚠ CAUTION

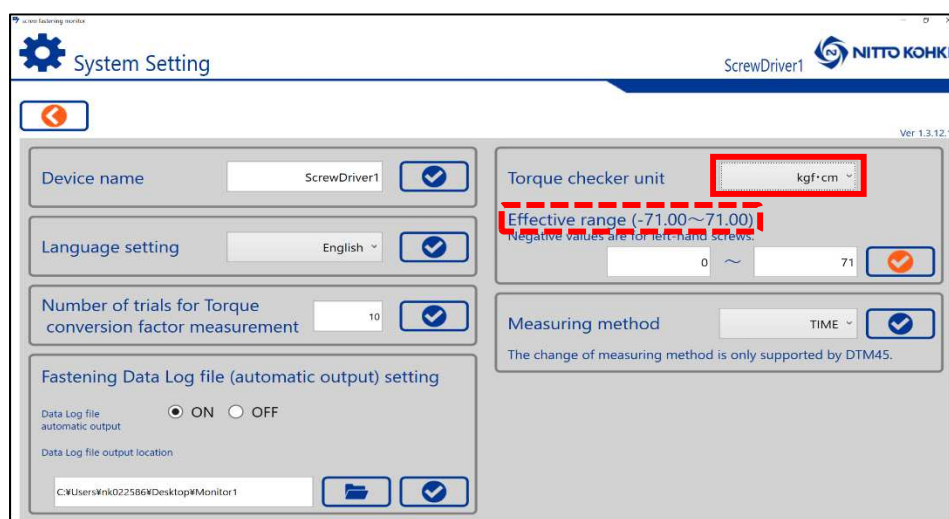
- **When the output torque unit is changed, the following settings are initialized:**

- Torque conversion factor
- Upper and lower limits of the output torque (conversion value) judgment values
- Upper and lower limits of the screw fastening time/rotation signal judgment values

1 Select the unit in the [Torque checker unit] pulldown menu.

Select the unit from [Nm], [cNm], [lbf·in], and [kgf·cm].

The effective range display switches according to the selected unit.



2 Enter the upper and lower limits in the [Effective range] fields.

The range that can be entered differs according to the unit selected in Step 1.

Unit	Range
Nm	-8.000 to 8.000
cNm	-800.0 to 800.0
lbf·in	-82.00 to 82.00
kgf·cm	-71.00 to 71.00

System Setting

ScrewDriver1 NITTO KOHKI

Ver 1.3.12.1

Device name: ScrewDriver1

Language setting: English

Number of trials for Torque conversion factor measurement: 10

Fastening Data Log file (automatic output) setting

Data Log file automatic output: ☒ ON ☐ OFF

Data Log file output location: C:\Users\nik022586\Desktop\Monitor1

Torque checker unit: kgf·cm

Effective range (-71.00~71.00)

Negative values are for left-hand screws.

Measuring method: TIME

The change of measuring method is only supported by DTM45.

3 Click the save button.

System Setting

ScrewDriver1 NITTO KOHKI

Ver 1.3.12.1

Device name: ScrewDriver1

Language setting: English

Number of trials for Torque conversion factor measurement: 10

Fastening Data Log file (automatic output) setting

Data Log file automatic output: ☒ ON ☐ OFF

Data Log file output location: C:\Users\nik022586\Desktop\Monitor1

Torque checker unit: kgf·cm

Effective range (-71.00~71.00)

Negative values are for left-hand screws.

Measuring method: TIME

The change of measuring method is only supported by DTM45.

A confirmation dialog is displayed.

4 Click the [OK] button.

Warning

If the tightening unit is changed, all channel settings will be initialized. Is it OK?

OK Cancel

- Main screen after unit is changed

[Torque checker unit] set to [Nm]

The screenshot shows the 'Screw fastening monitor' interface. The 'Operation channel' is selected. The 'Converted Torque' field displays 'Nm' in a red box. The 'Time' field displays 'sec'.

[Torque checker unit] set to [kgf·cm]

The screenshot shows the 'Screw fastening monitor' interface. The 'Operation channel' is selected. The 'Converted Torque' field displays 'kgf·cm' in a red box. The 'Time' field displays 'sec'.

- Measurement error in [Torque conversion] screen

Mismatch between [Torque checker unit] setting and output torque unit

The screenshot shows the 'Torque conversion' screen. The 'Operation channel' is 'Measured date/time'. The 'Measured Value (Torque Checker)' is 'Nm'. The 'Current Value (Converted)' is 'Nm'. The 'T.C.factor' is '1.0000'. The 'Output contents of Torque checker' shows '2019/12/06 10:14:50 ERROR + 0.61 N*m SetUnit[kgf·cm] DataUnit[Nm]'. A red dashed box highlights the 'T.C.factor' and the 'Output contents of Torque checker'.

[Torque checker unit] setting: kgf·cm
Output torque unit: Nm

Output torque value outside of [Effective range] setting range

The screenshot shows the 'Torque conversion' screen. The 'Operation channel' is 'Measured date/time'. The 'Measured Value (Torque Checker)' is 'Nm'. The 'Current Value (Converted)' is 'Nm'. The 'T.C.factor' is '1.0000'. The 'Output contents of Torque checker' shows '2019/12/06 10:16:06 ERROR - 2.4 kgf·cm SetLower[0] SetUpper[71] DataValue[-2.4]'. A red dashed box highlights the 'T.C.factor' and the 'Output contents of Torque checker'.

[Effective range] setting: 0 to 71.00
Output torque value: -2.40

Setting the value measurement method

The measurement method of values used in fastening judgment when a DTM45 screw fastening monitor is connected can be changed. One of the following two measurement methods can be selected: Signal (SIGNAL) and time (TIME) from the start of the electric screwdriver rotation until torque up.

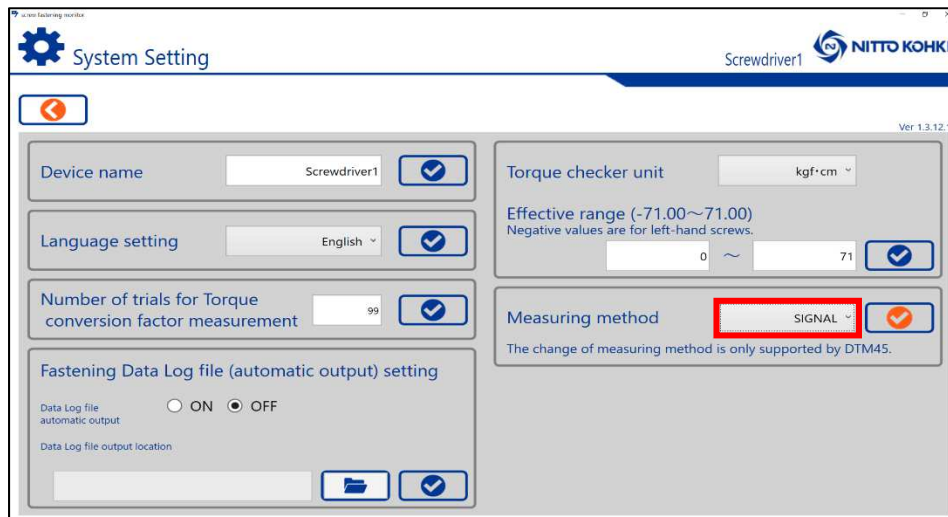
Set the measurement method matched to the setting on the controller connected to the DTM45. For details on controller (DCC0241X-AZ) settings, check the instruction manual for the controller.

When the measurement method is changed, the display of the main screen (p. 9) and the [Judgment value setting] screen (p. 39) changes.

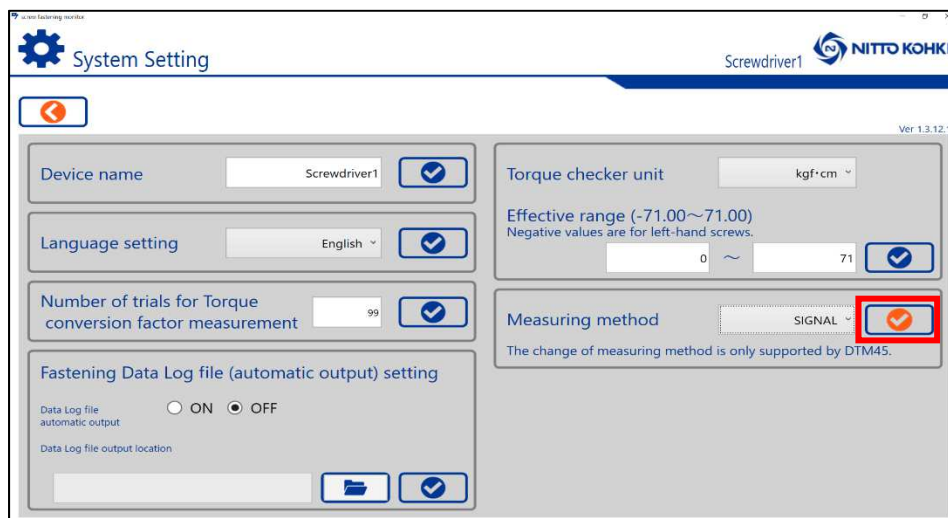
⚠ CAUTION

- When the model of the screw fastening monitor is the DTM10, the measurement method is fixed to time (TIME).
- When the measurement method is changed, the upper and lower limits of the screw fastening time/rotation signal judgment values are initialized.

1 Select [TIME] or [SIGNAL] in the [Measurement method] pulldown menu.

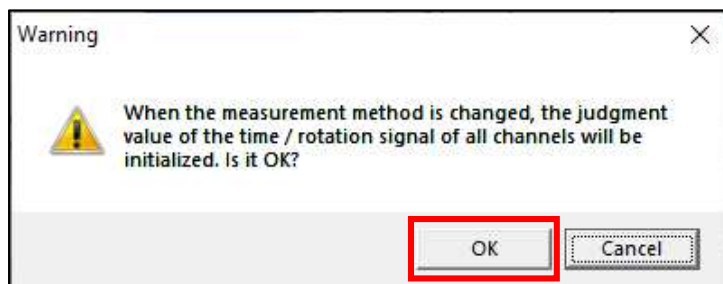


2 Click the save button.



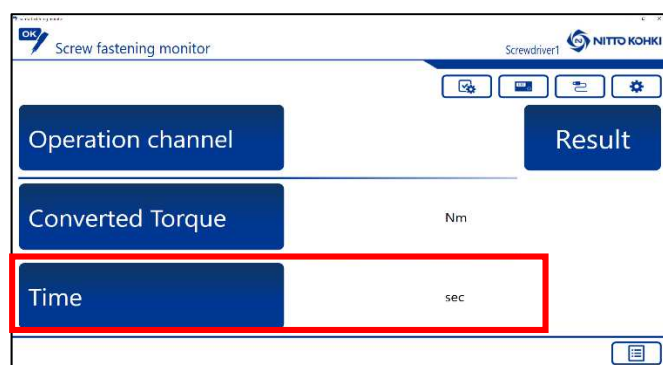
A confirmation dialog is displayed.

3 Click the [OK] button.

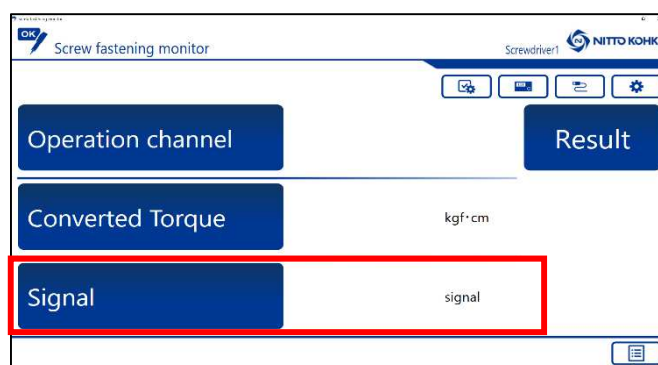


● Main screen after measurement method is changed

[Measurement method] set to [TIME]

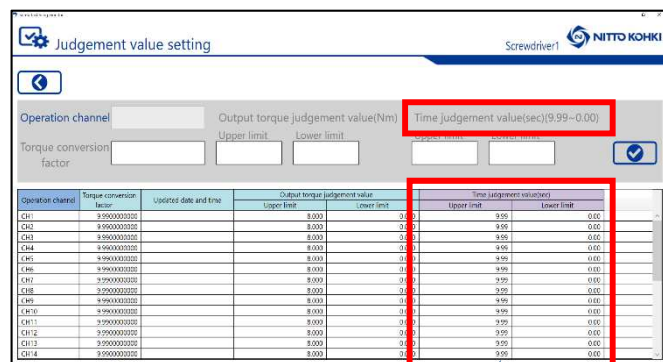


[Measurement method] set to [SIGNAL]

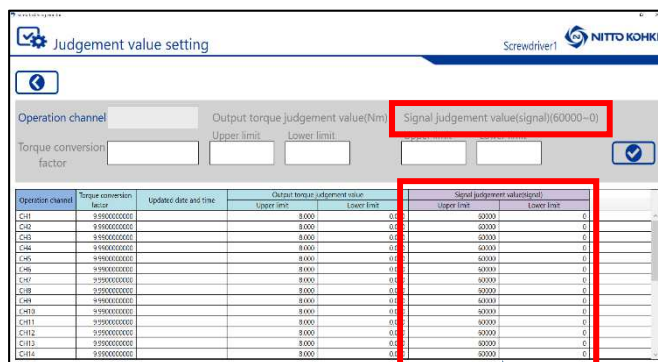


● [Judgment value setting] screen after measurement method is changed


[Measurement method] set to [TIME]



[Measurement method] set to [SIGNAL]



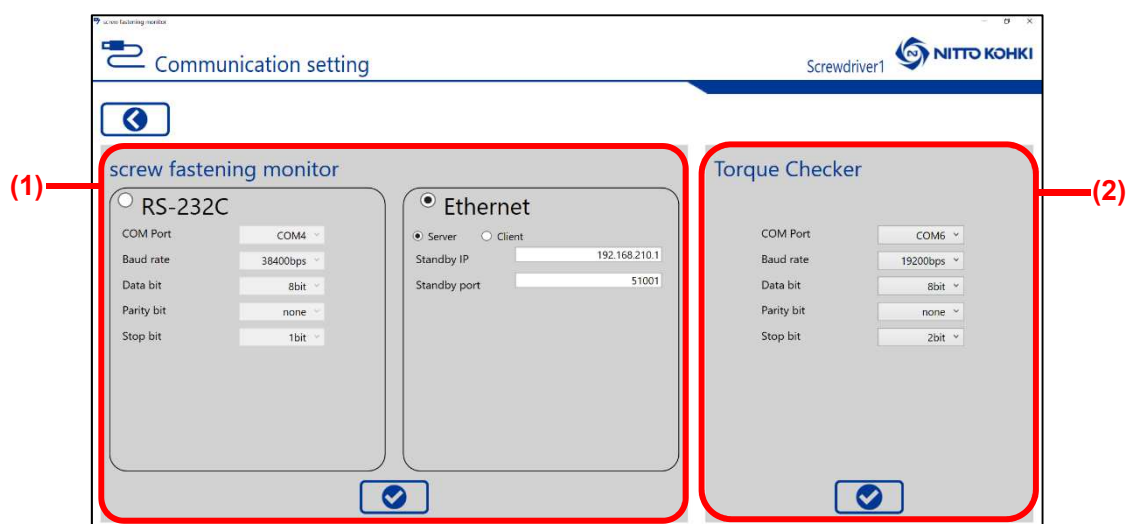
Communication setting

When  in the main screen is clicked, the [Communication setting] screen is displayed.



Configuration of [Communication setting] screen

In the [Communication setting] screen, set up communication with the screw fastening monitor and torque checker.



No.	Name	Details	Reference
(1)	Screw fastening monitor communication setting	Sets the communication method and communication environment with the screw fastening monitor.	p. 25
(2)	Torque checker communication setting	Sets the communication environment with the torque checker.	p. 28

Setting communication with the screw fastening monitor

Set the communication method and communication environment with the screw fastening monitor.

For details on the transmission speed and other specifications of the screw fastening monitor, refer to “Compatible models” (p. 5).

When an RS-232C/Ethernet converter is used for the network connection, set according to the instruction manual for the converter.

1 Click the [RS-232C] or [Ethernet] radio button.

The screenshot shows the 'Communication setting' window. On the left, under 'screw fastening monitor', there are two radio buttons: 'RS-232C' (selected and highlighted with a red box) and 'Ethernet' (highlighted with a red box). Below 'RS-232C', there are settings for COM Port (COM4), Baud rate (38400bps), Data bit (8bit), Parity bit (none), and Stop bit (1bit). Below 'Ethernet', there are settings for Server/Client, Standby IP (192.168.210.1), and Standby port (51001). On the right, the 'Torque Checker' section has settings for COM Port (COM6), Baud rate (19200bps), Data bit (8bit), Parity bit (none), and Stop bit (2bit). Both sections have a checkmark button at the bottom.

2 Set the respective items for the selected communication method.

When the communication method is set to [RS-232C], set [COM Port], [Baud rate] (transmission speed), [Data bit] (number of data), [Parity bit], and [Stop bit].

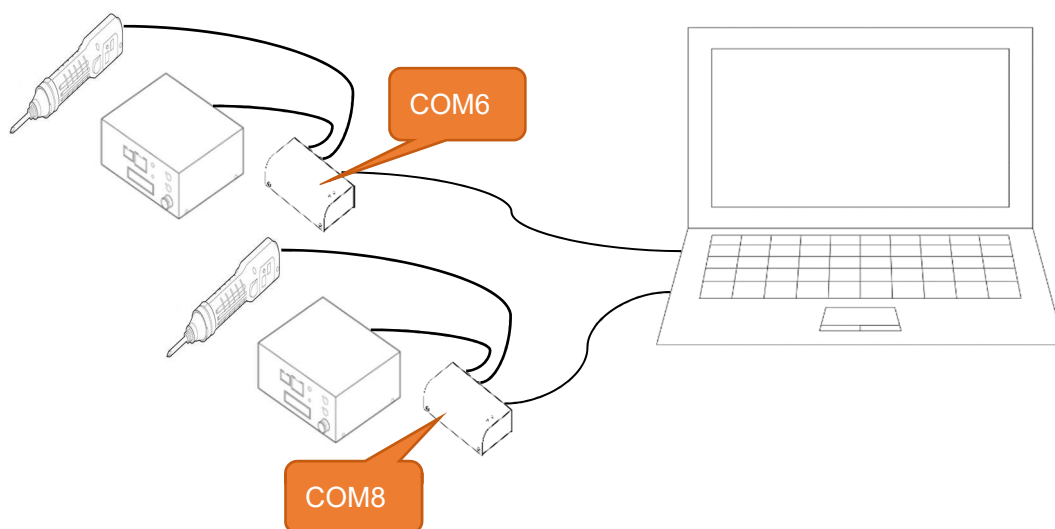
This screenshot is identical to the one above, showing the 'Communication setting' window. The 'RS-232C' radio button is selected and highlighted with a red box. The 'Ethernet' radio button is also highlighted with a red box. The 'Torque Checker' section is visible on the right. The settings for 'RS-232C' are: COM Port (COM4), Baud rate (38400bps), Data bit (8bit), Parity bit (none), and Stop bit (1bit). The settings for 'Ethernet' are: Server/Client, Standby IP (192.168.210.1), and Standby port (51001). The settings for 'Torque Checker' are: COM Port (COM6), Baud rate (19200bps), Data bit (8bit), Parity bit (none), and Stop bit (2bit). Both sections have a checkmark button at the bottom.

When the communication method is set to [Ethernet], set the following.

Selection of server/client	Setting item
Server (PC side server node)	[Standby IP], [Standby port]
Client (Screw fastening monitor side server node)	[Destination IP], [Destination port]

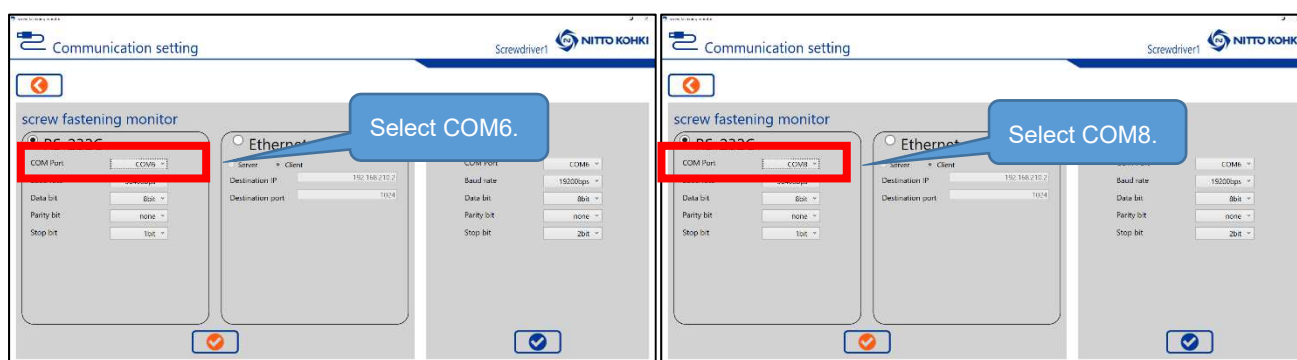
The screenshot shows the 'Communication setting' window. The 'Ethernet' section is highlighted with a red box, indicating the selected communication method. Within this section, the 'Client' radio button is selected, and the 'Destination IP' is set to '192.168.210.2' and the 'Destination port' is set to '1024'. The 'screw fastening monitor' section shows 'RS-232C' selected with parameters: COM Port (COM4), Baud rate (38400bps), Data bit (8bit), Parity bit (none), and Stop bit (1bit). The 'Torque Checker' section shows 'COM6' selected with parameters: COM Port (COM6), Baud rate (19200bps), Data bit (8bit), Parity bit (none), and Stop bit (2bit). Each section has a checkmark button at the bottom.

When two or more screw fastening monitors are connected, set each of the connection port Nos.
For example, when a screw fastening monitor is connected to the COM6 and COM8 ports on the PC with the communication method set to [RS-232C], set [COM Port] to [COM6] and [COM8] in the [Communication setting] screen of the respective software.

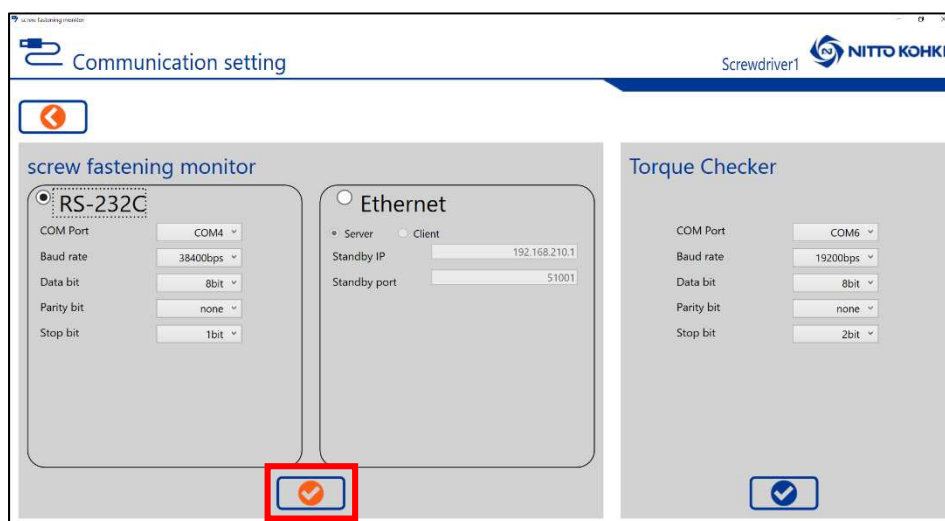


1st software

2nd software



3 Click the save button.



Setting communication with the torque checker

Set the communication environment with the torque checker.

The communication method used in communication with the torque checker is RS-232C.

For details on the transmission speed and other specifications of the torque checker, refer to “Compatible models” (p. 5).

1 Set the [Torque Checker] items.

Set [COM Port], [Baud rate] (transmission speed), [Data bit] (number of data), [Parity bit], and [Stop bit].

The screenshot shows the 'Communication setting' window with the 'Torque Checker' section highlighted. The settings for the Torque Checker are as follows:

Setting	Value
COM Port	COM6
Baud rate	19200bps
Data bit	8bit
Parity bit	none
Stop bit	2bit


2 Click the save button.

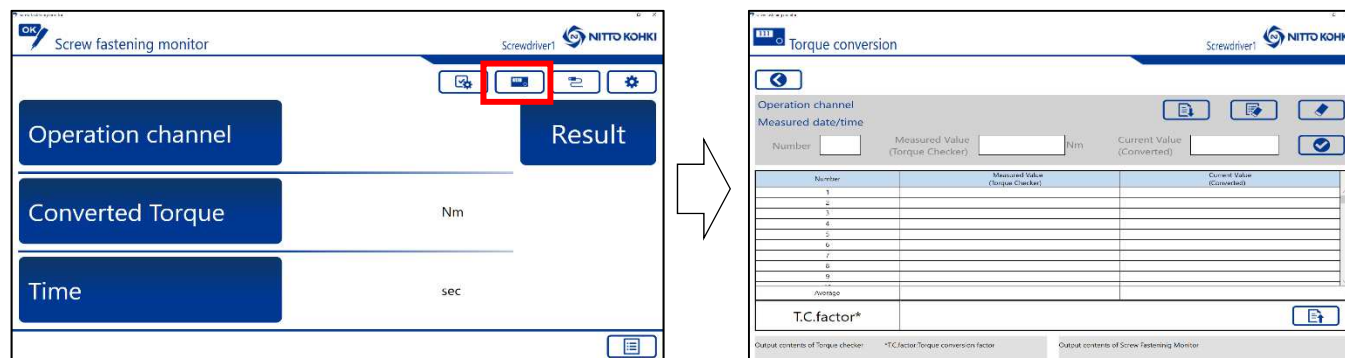
The screenshot shows the 'Communication setting' window with the 'Torque Checker' section highlighted. The settings for the Torque Checker are as follows:

Setting	Value
COM Port	COM6
Baud rate	19200bps
Data bit	8bit
Parity bit	none
Stop bit	2bit

The 'Save' button (a blue button with a white checkmark) is highlighted with a red box.

Torque conversion

When  in the main screen is clicked, the [Torque conversion] screen is displayed.



In the [Torque conversion] screen, the torque conversion factor is calculated by the following formula:

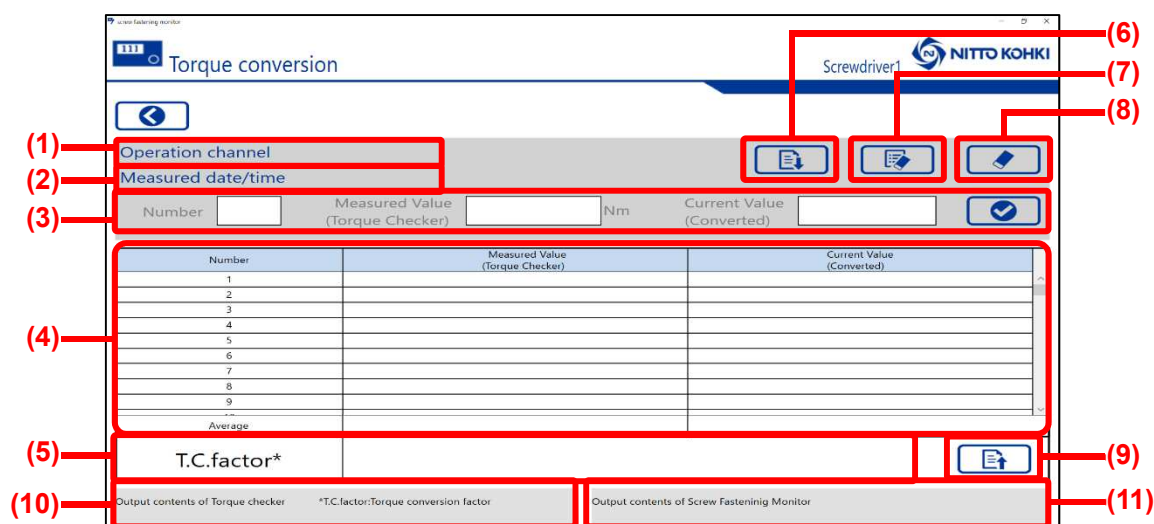
$$\text{Torque conversion factor} = \frac{\text{Average value of measurement value (output torque) of torque checker}}{\text{Average value of converted current value}}$$

The torque conversion factor is used for converting the converted current value received from the screw fastening monitor to output torque (conversion value).

⚠ WARNING

- Periodically update the torque conversion factor.

Configuration of [Torque conversion] screen



No.	Name	Details	Reference
(1)	Operation channel	Displays the channel No. that was initially sent from the screw fastening monitor. Only commands from the currently displayed channel No. are accepted. Commands from other channels are invalid.	—
(2)	Measured date/time	Displays the final communication date/time or final edit date/time.	—
(3)	Value edit area	This is used for manually entering values in the measurement list. This is not available when a channel No. has not yet been received.	p. 34
(4)	Measurement list	Displays a list of converted current values received from the screw fastening monitor and output torque measurement values received from the torque checker.	p. 31
(5)	Torque conversion factor	Displays the torque conversion factor calculated based on the values in the measurement list.	p. 31
(6)	Export CSV button	Displays the export dialog. The CSV file(s) is saved to the designated directory.	p. 38
(7)	Batch delete button	Deletes all values in the measurement list.	p. 37
(8)	Delete button	Deletes the values of the selected row in the measurement list.	p. 36
(9)	Update factor button	Saves the torque conversion factor.	p. 31
(10)	Torque checker output content	Displays the content that was last received from the torque checker.	p. 31
(11)	Screw fastening monitor output content	Displays the content that was last received from the screw fastening monitor.	p. 31

Calculating the torque conversion factor

- 1 Connect the screw fastening monitor and torque checker to the PC.**
At this stage, set up the electric screwdriver so that the target torque can be output.
- 2 In the [Communication setting] screen, set up communication with the torque checker and screw fastening monitor.**
For details, refer to “Communication setting” (p. 24).

- 3 Display the [Torque conversion] screen.**

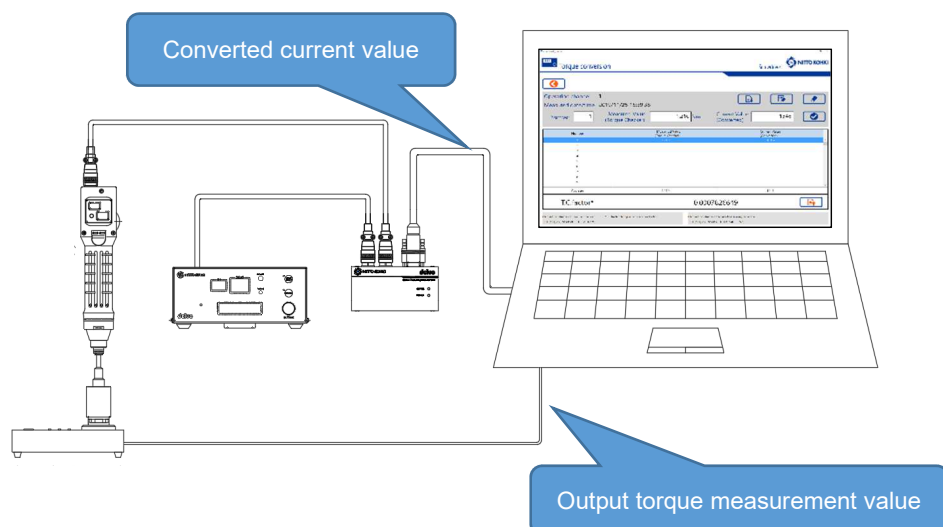
Number	Measured Value (Torque Checker)	Current Value (Converted)
1		
2		
3		
4		
5		
6		
7		
8		
9		
Average		

T.C.factor*

- 4 Measure the output torque of the electric screwdriver on the torque checker.**
The converted current value of the screw fastening monitor is sent to the PC.

5 Send the output torque measurement value from the torque checker to the PC.

For details on how to send the output torque measurement value, refer to the instruction manual for the torque checker.



The converted current value and output torque measurement value are displayed in the [Torque conversion] screen.

The screenshot shows the 'Torque conversion' screen. At the top, it displays 'Operation channel 1' and 'Measured date/time 2019/11/25 15:39:38'. Below this, there are input fields for 'Number 1', 'Measured Value (Torque Checker) 1.210 Nm', and 'Current Value (Converted) 1546'. A table below shows the measurement data for trial 1, with the first row highlighted in blue. The table has columns for 'Measured Value (Torque Checker)' and 'Current Value (Converted)'. At the bottom, the 'T.C.factor*' is calculated as 0.0007826649. A status bar at the very bottom shows the output contents of the torque checker and the screw fastening monitor.

The converted current value and output torque measurement value are displayed on the row of measurement count [1].

The content of received data is displayed at the bottom of the screen.

Count	Measured Value (Torque Checker)	Current Value (Converted)
1	1.210	1546
2		
3		
4		
5		
6		
7		
8		
9		
Average	1.210	1546

T.C.factor* 0.0007826649

Output contents of Torque checker: 2019/11/25 15:39:38 + 1.21 N*m
 *T.C.factor: Torque conversion factor
 Output contents of Screw Fastening Monitor: 2019/11/25 15:39:37 CH1:1546-1157.

The second measurement is enabled when the converted current value and output torque measurement value are received correctly.



6 Perform output torque measurement for the required number of times.

Measurement can be performed up to the number of times set at [Number of trials for Torque conversion factor measurement] field in the [System Setting] screen. For details, refer to "Setting the output torque measurement count for calculation of the torque conversion factor" (p. 15).

The torque conversion factor can be calculated even if the measurement count has not reached the value set in the [Number of trials for Torque conversion factor measurement] field.

7 Click the update factor button.

The torque conversion factor calculated based on all the converted current values and output torque measurement values in the measurement list is displayed.

Click . The data is updated and the button changes to .

Screwfastening monitor

Torque conversion

Screwdriver1 NITTO KOHKI

Operation channel 1

Measured date/time 2019/12/11 10:55:11

Number 10 Measured Value (Torque Checker) 1.67 Nm Current Value (Converted) 729

Number	Measured Value (Torque Checker)	Current Value (Converted)
2	1.680	734
3	1.700	725
4	1.700	727
5	1.700	736
6	1.670	764
7	1.700	752
8	1.710	719
9	1.700	746
10	1.670	729
Average	1.694	738.4

T.C.factor* 0.0022964789

Output contents of Torque checker *T.C.factor:Torque conversion factor

Output contents of Screw Fastening Monitor 2019/12/11 10:49:44 CH1:2035-328.

Manually entering values

Manually enter the converted current value and output torque measurement value.

1 Click the row containing the values to be edited.

The screenshot shows the 'Torque conversion' screen. At the top, there's a header with 'Torque conversion' and 'Screwdriver1' with the NITTO KOHKI logo. Below the header, there's a section for 'Operation channel' (1) and 'Measured date/time' (2019/12/11 11:01:00). There are three input fields: 'Number' (1), 'Measured Value (Torque Checker)' (1.700 Nm), and 'Current Value (Converted)' (734). Below these fields is a table with three columns: 'Number', 'Measured Value (Torque Checker)', and 'Current Value (Converted)'. The first row of the table is highlighted with a red border. The table has rows numbered 1 to 9, followed by an 'Average' row. At the bottom of the table is a 'T.C.factor*' field. The footer contains output contents of the Torque checker, T.C.factor, and the Screw Fastening Monitor.

Number	Measured Value (Torque Checker)	Current Value (Converted)
1	1.700	734
2		
3		
4		
5		
6		
7		
8		
9		
Average		

The count number of the clicked row is displayed at [Number] in the value edit area.

2 Enter values at [Measured Value (Torque Checker)] and [Current Value (Converted)] in the value edit area.

This screenshot is identical to the previous one, but the 'Measured Value (Torque Checker)' and 'Current Value (Converted)' input fields are highlighted with a red border. The table below shows the same data as the first screenshot.

Number	Measured Value (Torque Checker)	Current Value (Converted)
1	1.700	734
2		
3		
4		
5		
6		
7		
8		
9		
Average		


3 Click the save button.

Screwdriver1 NITTO KOHKI


Torque conversion

Operation channel 1

Measured date/time 2019/12/11 11:01:00

Number Measured Value (Torque Checker) Nm Current Value (Converted) 

Number	Measured Value (Torque Checker)	Current Value (Converted)
1		734
2		
3		
4		
5		
6		
7		
8		
9		
Average		

T.C.factor* 

Output contents of Torque checker *T.C.factor:Torque conversion factor

Output contents of Screw Fastening Monitor 2019/12/11 11:00:46 CH1:234-292.


The values are reflected in the measurement list.

Screwdriver1 NITTO KOHKI


Torque conversion

Operation channel 1

Measured date/time 2019/12/11 11:03:04

Number Measured Value (Torque Checker) Nm Current Value (Converted) 

Number	Measured Value (Torque Checker)	Current Value (Converted)
1	1.700	734
2		
3		
4		
5		
6		
7		
8		
9		
Average	1.700	734

T.C.factor* 0.0023160763 

Output contents of Torque checker *T.C.factor:Torque conversion factor

Output contents of Screw Fastening Monitor 2019/12/11 11:00:46 CH1:234-292.

Deleting values

Delete values in the measurement list.

1 Click the row containing the values to be deleted.

Operation channel 1
Measured date/time 2019/12/11 10:55:11
Number 4 Measured Value (Torque Checker) 1.700 Nm Current Value (Converted) 727

Number	Measured Value (Torque Checker)	Current Value (Converted)
2	1.680	734
3	1.700	725
4	1.700	727
5	1.700	736
6	1.670	764
7	1.700	752
8	1.710	719
9	1.700	746
10	1.670	729
Average	1.694	738.4

T.C.factor* 0.0022964789

Output contents of Torque checker *T.C.factor:Torque conversion factor
Output contents of Screw Fastening Monitor 2019/12/11 10:49:44 CH1:2035-328.

2 Click .

Operation channel 1
Measured date/time 2019/12/11 10:55:11
Number 4 Measured Value (Torque Checker) 1.700 Nm Current Value (Converted) 727

Number	Measured Value (Torque Checker)	Current Value (Converted)
2	1.680	734
3	1.700	725
4	1.700	727
5	1.700	736
6	1.670	764
7	1.700	752
8	1.710	719
9	1.700	746
10	1.670	729
Average	1.694	738.4

T.C.factor* 0.0022964789

Output contents of Torque checker *T.C.factor:Torque conversion factor
Output contents of Screw Fastening Monitor 2019/12/11 10:49:44 CH1:2035-328.

A confirmation dialog is displayed.

3 Click the [OK] button.

Question

Do you want to discard changes in torque conversion?

OK Cancel

The values of the selected row are deleted, and subsequent rows are pushed up one row.

Torque conversion

Operation channel 1

Measured date/time 2019/12/11 10:55:11

Number Measured Value (Torque Checker) Nm Current Value (Converted)

Number	Measured Value (Torque Checker)	Current Value (Converted)
2	1.660	734
3	1.700	725
4	1.700	736
5	1.670	764
6	1.700	752
7	1.710	719
8	1.700	746
9	1.670	729
10		
Average	1.694	739.667

T.C.factor* 0.0022918236

Output contents of Torque checker *T.C.factor:Torque conversion factor

Output contents of Screw Fastening Monitor 2019/12/11 10:49:44 CH1:2035-328

Batch deleting values

Delete all values in the measurement list.

1 Click .

Torque conversion

Operation channel 1

Measured date/time 2019/11/25 15:39:38

Number 1 Measured Value (Torque Checker) 1.210 Nm Current Value (Converted) 1546

Number	Measured Value (Torque Checker)	Current Value (Converted)
1	1.210	1546
2		
3		
4		
5		
6		
7		
8		
9		
Average	1.210	1546

T.C.factor* 0.0007826649

Output contents of Torque checker 2019/11/25 15:39:38 *T.C.factor:Torque conversion factor

Output contents of Screw Fastening Monitor 2019/11/25 15:39:37 CH1:1546-1157

A confirmation dialog is displayed.

2 Click the [OK] button.

Question

Reset all values displayed on Torque conversion factor measurement screen?

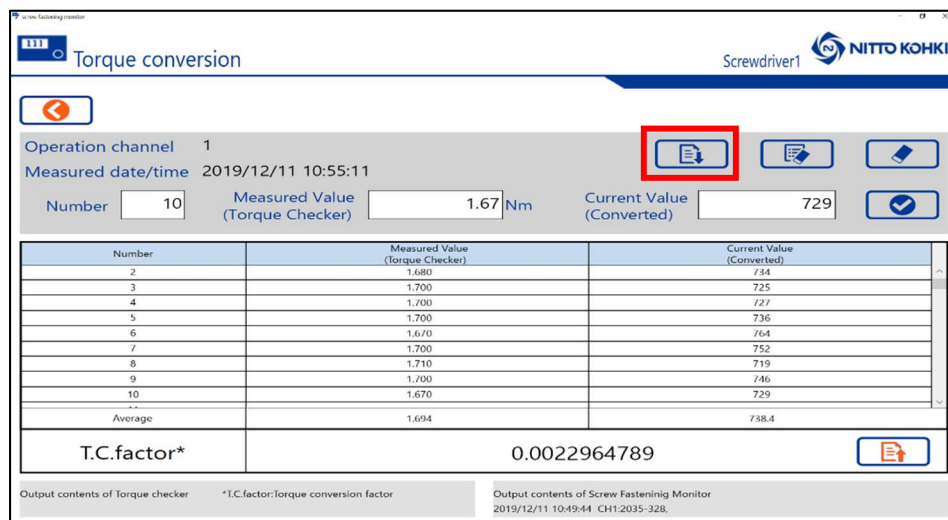
OK Cancel

All values are deleted.

Exporting the measurement list as a CSV file

Export and save the content of the measurement list as a CSV file.

1 Click .



Operation channel 1
Measured date/time 2019/12/11 10:55:11
Number 10 Measured Value (Torque Checker) 1.67 Nm Current Value (Converted) 729

Number	Measured Value (Torque Checker)	Current Value (Converted)
2	1.680	734
3	1.700	725
4	1.700	727
5	1.700	736
6	1.670	764
7	1.700	752
8	1.710	719
9	1.700	746
10	1.670	729
Average	1.694	738.4

T.C.factor* 0.0022964789

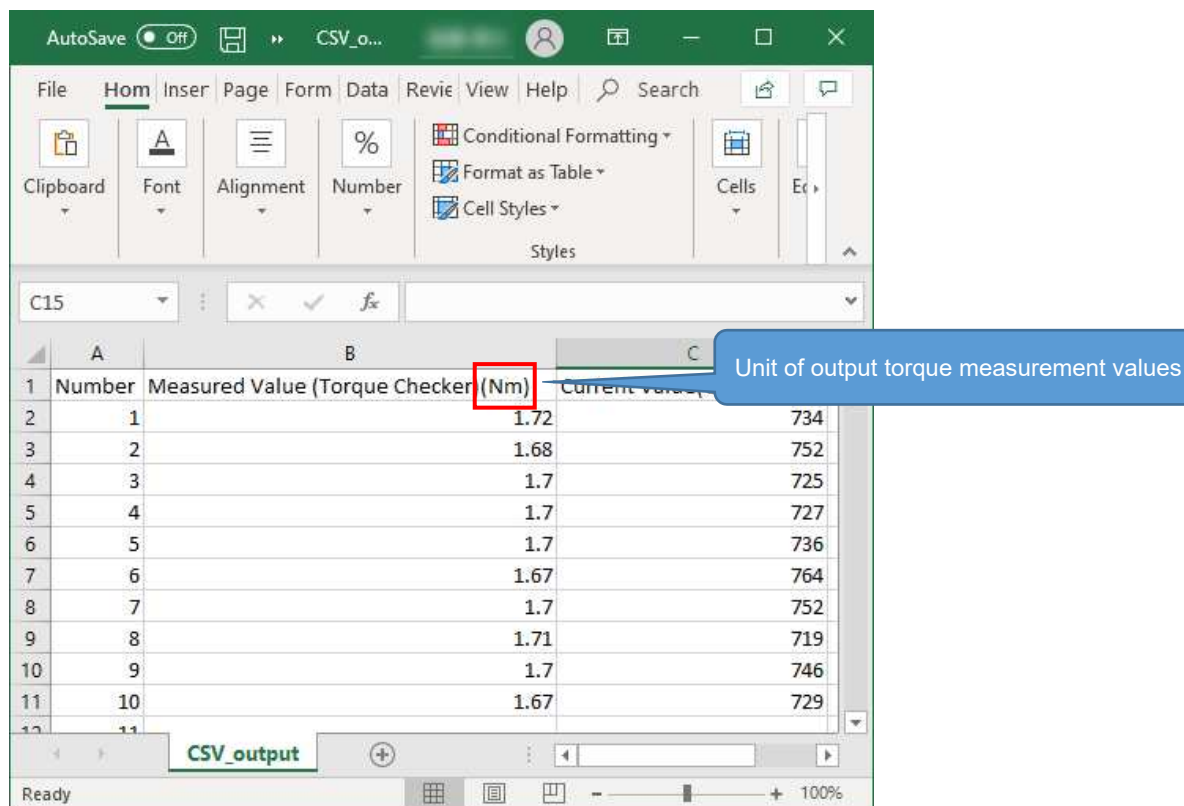
Output contents of Torque checker *T.C.factor:Torque conversion factor
Output contents of Screw Fastening Monitor 2019/12/11 10:49:44 CH1:2035-328

The export dialog is displayed.

2 Designate the output destination of the CSV file.

The CSV file is saved to the designated directory.

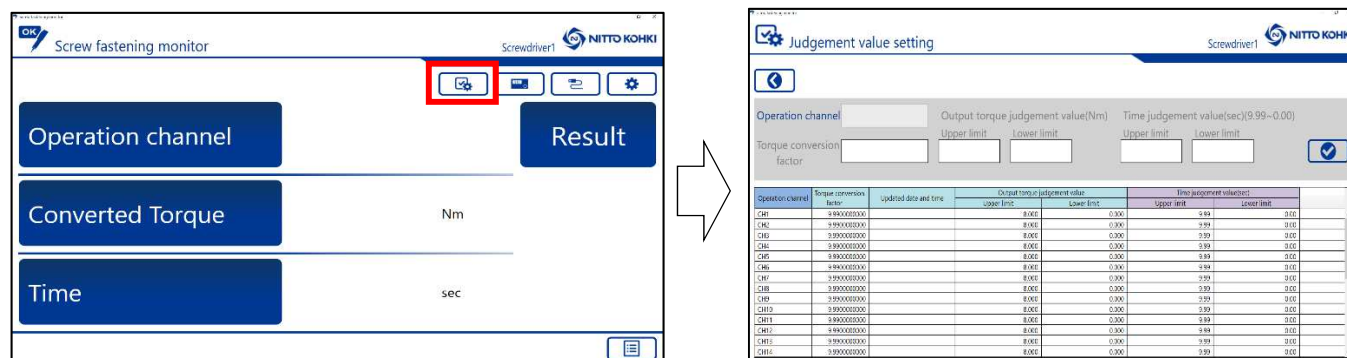
Content of CSV file



	A	B	C
1	Number	Measured Value (Torque Checker) (Nm)	Current Value (Converted)
2	1	1.72	734
3	2	1.68	752
4	3	1.7	725
5	4	1.7	727
6	5	1.7	736
7	6	1.67	764
8	7	1.7	752
9	8	1.71	719
10	9	1.7	746
11	10	1.67	729

Judgment value setting

When  in the main screen is clicked, the [Judgment value setting] screen is displayed.



In the [Judgment value setting] screen, set the range (upper and lower limits) of judgment values for fastening judgment for each individual operation channel.

Fastening is judged as passed if the output torque (conversion value) and screw fastening time/rotation signal values fall within this set range.

Defaults for each item

Item		Default
Torque conversion factor		9.99 ^{*1}
Output torque judgment value	Upper limit	8.000, etc. ^{*2}
	Lower limit	0
Time judgment value ^{*3}	Upper limit	9.99
	Lower limit	0
Rotation signal judgment value ^{*3}	Upper limit	60000
	Lower limit	0

^{*1} The calculated torque conversion factor is displayed when the torque conversion factor has already been calculated in the [Torque conversion factor] screen (p. 29).

^{*2} The upper limit of the output torque judgment value varies according to the setting of [Torque checker unit] in the [System Setting] screen. Also, the default is the same as for [Effective range]. For details, refer to “Setting the unit and effective range of output torque values” (p. 19).

^{*3} Either of time judgment value and rotation signal judgment value is displayed depending on the setting of [Measurement method] in the [System Setting] screen. For details, refer to “Setting the value measurement method” (p. 22).

Configuration of [Judgment value setting] screen

The screenshot shows the 'Judgment value setting' screen. At the top, there is a title bar with 'Screwdriver1' and the 'NITTO KOHKI' logo. Below the title bar, there is a navigation bar with a back arrow icon. The main area contains several input fields and a table. Callout (1) points to the 'Operation channel' dropdown menu. Callout (2) points to the 'Torque conversion factor' input field. Callout (3) points to the 'Output torque judgement value(Nm)' and 'Time judgement value(sec)(9.99~0.00)' input fields, which are grouped together. Callout (4) points to the 'Judgment value list' table, which displays the torque conversion factor and judgment values for each operation channel.

Operation channel	Torque conversion factor	Updated date and time	Output torque judgement value		Time judgement value(sec)	
			Upper limit	Lower limit	Upper limit	Lower limit
CH1	9.9900000000		8.000	0.000	9.99	0.00
CH2	9.9900000000		8.000	0.000	9.99	0.00
CH3	9.9900000000		8.000	0.000	9.99	0.00
CH4	9.9900000000		8.000	0.000	9.99	0.00
CH5	9.9900000000		8.000	0.000	9.99	0.00
CH6	9.9900000000		8.000	0.000	9.99	0.00
CH7	9.9900000000		8.000	0.000	9.99	0.00
CH8	9.9900000000		8.000	0.000	9.99	0.00
CH9	9.9900000000		8.000	0.000	9.99	0.00
CH10	9.9900000000		8.000	0.000	9.99	0.00
CH11	9.9900000000		8.000	0.000	9.99	0.00
CH12	9.9900000000		8.000	0.000	9.99	0.00
CH13	9.9900000000		8.000	0.000	9.99	0.00
CH14	9.9900000000		8.000	0.000	9.99	0.00

No.	Name	Details	Reference
(1)	Operation channel	Displays the No. of the currently selected operation channel.	—
(2)	Torque conversion factor edit area	This is used for editing the torque conversion factor in the judgment value list.	p. 41
(3)	Judgment value edit area	This is used for editing the upper and lower limits of each judgment values in the judgment value list.	p. 41
(4)	Judgment value list	Displays the torque conversion factor and judgment values of each operation channel.	—

Setting judgment values

- 1 Click the row containing the judgment values to be edited.

Judgement value setting

Operation channel: CH4

Torque conversion factor: 0.0022964789

Updated date and time: 2020/01/17 18:45:32

Output torque judgement value(Nm): Upper limit: 2, Lower limit: 1.5

Time judgement value(sec)(9.99~0.00): Upper limit: 0.7, Lower limit: 0.5

Operation channel	Torque conversion factor	Updated date and time	Output torque judgement value		Time judgement value(sec)	
			Upper limit	Lower limit	Upper limit	Lower limit
CH1	9.9900000000		8.000	0.000	9.99	0.00
CH2	9.9900000000		8.000	0.000	9.99	0.00
CH3	9.9900000000		8.000	0.000	9.99	0.00
CH4	0.0022964789	2020/01/17 18:45:32	8.000	0.000	9.99	0.00
CH5	9.9900000000		8.000	0.000	9.99	0.00
CH6	9.9900000000		8.000	0.000	9.99	0.00
CH7	9.9900000000		8.000	0.000	9.99	0.00
CH8	9.9900000000		8.000	0.000	9.99	0.00
CH9	9.9900000000		8.000	0.000	9.99	0.00
CH10	9.9900000000		8.000	0.000	9.99	0.00
CH11	9.9900000000		8.000	0.000	9.99	0.00
CH12	9.9900000000		8.000	0.000	9.99	0.00
CH13	9.9900000000		8.000	0.000	9.99	0.00
CH14	9.9900000000		8.000	0.000	9.99	0.00

- 2 Enter values in the torque conversion factor edit area and the judgment value edit area.

Judgement value setting

Operation channel: CH4

Torque conversion factor: 0.0022964789

Updated date and time: 2020/01/17 18:45:32

Output torque judgement value(Nm): Upper limit: 2, Lower limit: 1.5

Time judgement value(sec)(9.99~0.00): Upper limit: 0.7, Lower limit: 0.5

Operation channel	Torque conversion factor	Updated date and time	Output torque judgement value		Time judgement value(sec)	
			Upper limit	Lower limit	Upper limit	Lower limit
CH1	9.9900000000		8.000	0.000	9.99	0.00
CH2	9.9900000000		8.000	0.000	9.99	0.00
CH3	9.9900000000		8.000	0.000	9.99	0.00
CH4	0.0022964789	2020/01/17 18:45:32	8.000	0.000	9.99	0.00
CH5	9.9900000000		8.000	0.000	9.99	0.00
CH6	9.9900000000		8.000	0.000	9.99	0.00
CH7	9.9900000000		8.000	0.000	9.99	0.00
CH8	9.9900000000		8.000	0.000	9.99	0.00
CH9	9.9900000000		8.000	0.000	9.99	0.00
CH10	9.9900000000		8.000	0.000	9.99	0.00
CH11	9.9900000000		8.000	0.000	9.99	0.00
CH12	9.9900000000		8.000	0.000	9.99	0.00
CH13	9.9900000000		8.000	0.000	9.99	0.00
CH14	9.9900000000		8.000	0.000	9.99	0.00

- 3 Click the save button.

Judgement value setting

Operation channel: CH4

Torque conversion factor: 0.0022964789

Updated date and time: 2020/01/17 18:45:32

Output torque judgement value(Nm): Upper limit: 2, Lower limit: 1.5

Time judgement value(sec)(9.99~0.00): Upper limit: 0.7, Lower limit: 0.5

Operation channel	Torque conversion factor	Updated date and time	Output torque judgement value		Time judgement value(sec)	
			Upper limit	Lower limit	Upper limit	Lower limit
CH1	9.9900000000		8.000	0.000	9.99	0.00
CH2	9.9900000000		8.000	0.000	9.99	0.00
CH3	9.9900000000		8.000	0.000	9.99	0.00
CH4	0.0022964789	2020/01/17 18:45:32	8.000	0.000	9.99	0.00
CH5	9.9900000000		8.000	0.000	9.99	0.00
CH6	9.9900000000		8.000	0.000	9.99	0.00
CH7	9.9900000000		8.000	0.000	9.99	0.00
CH8	9.9900000000		8.000	0.000	9.99	0.00
CH9	9.9900000000		8.000	0.000	9.99	0.00
CH10	9.9900000000		8.000	0.000	9.99	0.00
CH11	9.9900000000		8.000	0.000	9.99	0.00
CH12	9.9900000000		8.000	0.000	9.99	0.00
CH13	9.9900000000		8.000	0.000	9.99	0.00
CH14	9.9900000000		8.000	0.000	9.99	0.00

The entered judgment values are reflected in the judgment value list.

4. Checking the Judgment Result (Main Screen)

Whether or not screw fastening has been performed correctly by the electric screwdriver in use is judged in the [Screw fastening monitor] (main screen).



No.	Name	Details
(1)	Operation channel	Displays the No. of the operation channel currently in use for the operation targeted by fastening judgment.
(2)	Output torque (conversion value)	Displays the output torque (conversion value) that was calculated based on the converted current value and torque conversion factor for the operation channel in use. When the output torque (conversion value) is judged as passed, the background of this item changes color to blue, and when judged as failed, the background changes color to red.
(3)	Screw fastening time/rotation signal	Displays the screw fastening time or rotation signal. When the screw fastening time/rotation signal is judged as passed, the background of this item changes color to blue, and when judged as failed, the background changes color to red.
(4)	Overall judgment result	When both the output torque (conversion value) and the screw fastening time/rotation signal are judged as passed, "OK" (blue background) is displayed, and when one of these items is judged as failed, "NG" (red background) is displayed.
(5)	Last received content	Displays a summary of the command data that was last received from the screw fastening monitor.

Whether or not the output torque (conversion value) that was calculated based on the converted current value received from the screw fastening monitor and the screw fastening time/rotation signal fall within the preset judgment value range is judged.

The output torque (conversion value) is calculated by the following formula.

$$\text{Output torque (conversion value)} = \text{Converted current value} \times \text{Torque conversion factor}$$

The torque conversion factor is set in the [Torque conversion] screen (p. 29).

The judgment value ranges of the output torque (conversion value) and screw fastening time/rotation signal are set in the [Judgment value setting] screen (p. 39).

⚠ WARNING

- The torque value displayed in the software is the output torque (conversion value). It is not the fastening torque.

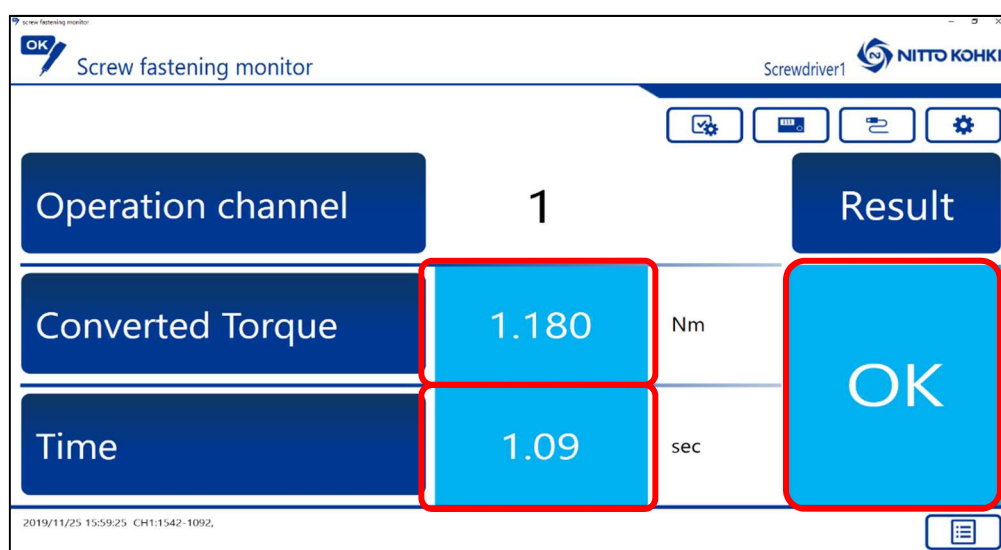
Using a torque wrench, etc., make sure that the screw is fastened at the target fastening torque by the loosening torque method or refastening torque method.

Executing fastening judgment

1 Perform screw fastening with the currently connected electric screwdriver and with the main screen displayed.

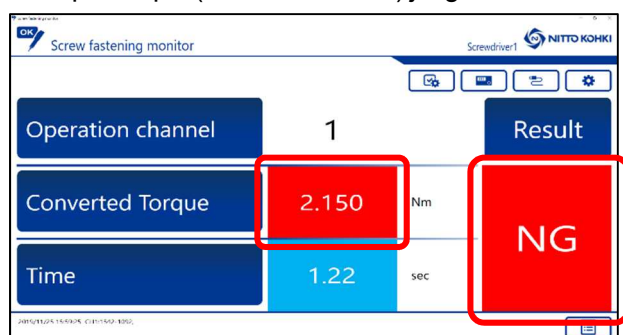
The converted current value and screw fastening time/rotation signal are sent to the PC from the screw fastening monitor, and fastening judgment is performed based on that data. The judgment result is displayed in the main screen.

When both the output torque (conversion value) and screw fastening time/rotation signal are judged as passed, “OK” is displayed at the overall judgment result, and the background changes color to blue.

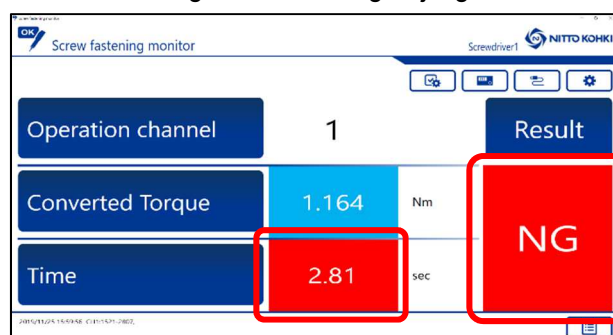


When one of the output torque (conversion value) and screw fastening time/rotation signal is judged as failed, “NG” is displayed at the overall judgment result, and the background changes color to red.


Output torque (conversion value) judged as failed

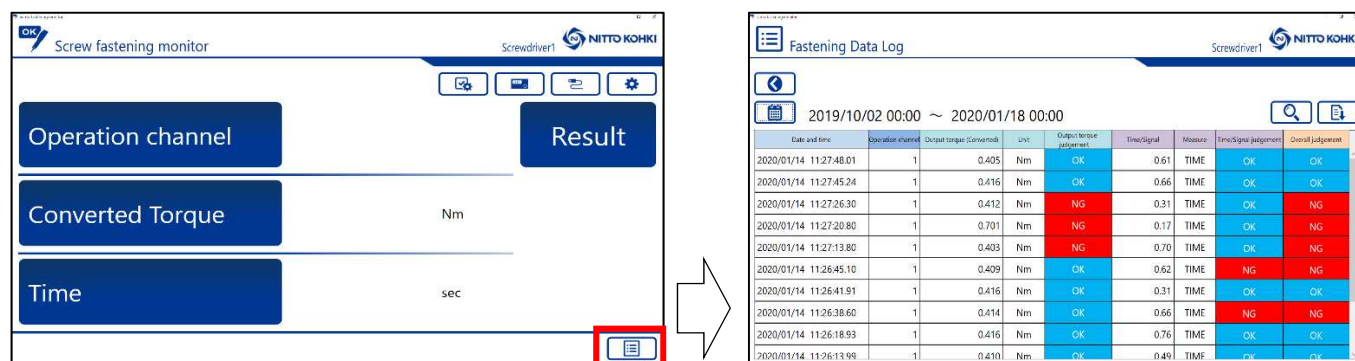


Screw fastening time/rotation signal judged as failed

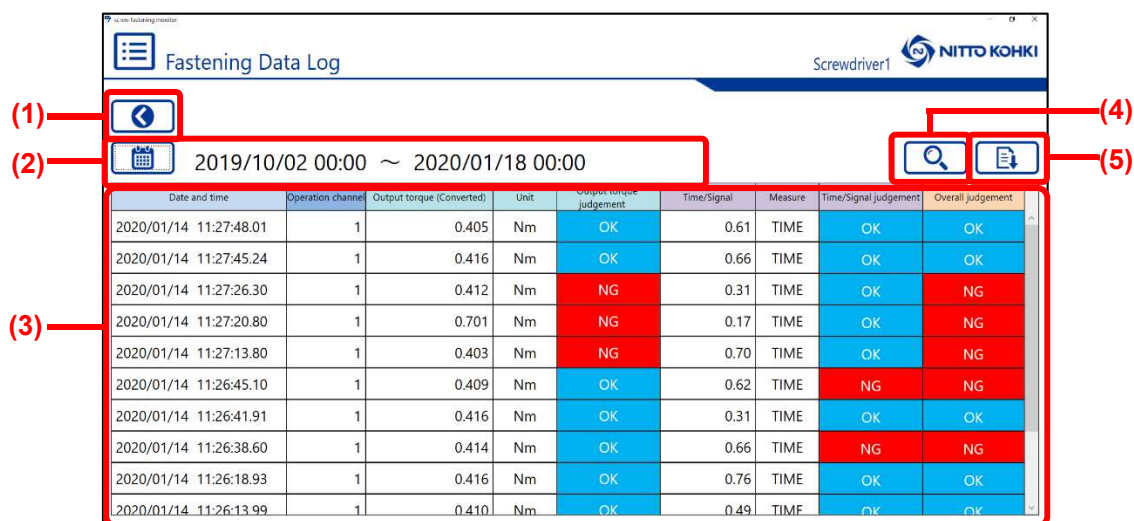


5. Fastening Data Log

When  in the main screen is clicked, the [Fastening Data Log] screen is displayed, and whether or not screw fastening has been performed correctly in past operations can be checked.



Configuration of [Fastening Data Log] screen

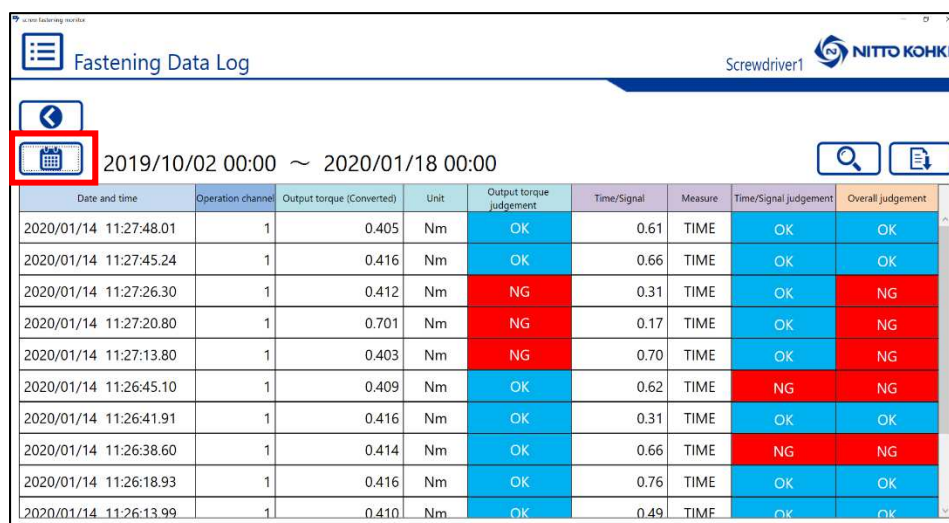


No.	Name	Details	Reference
(1)	Back button	Clicking this button returns to the main screen.	—
(2)	Period setting button	Displays the period setting dialog. Operations that were performed during the set period are displayed.	p. 45
(3)	Data log list	Displays a data log list of fastening operations.	—
(4)	Filter button	Displays the filter dialog. Operations that match the set filter conditions are displayed.	p. 46
(5)	Export CSV button	Displays the export dialog. The CSV file is saved to the directory designated in the dialog.	p. 47

Setting the display period

Set the target period and display the operation data log.


1 Click .

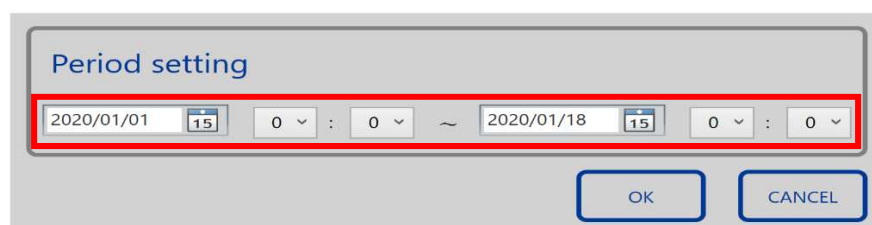


Date and time	Operation channel	Output torque (Converted)	Unit	Output torque judgement	Time/Signal	Measure	Time/Signal judgement	Overall judgement
2020/01/14 11:27:48.01	1	0.405	Nm	OK	0.61	TIME	OK	OK
2020/01/14 11:27:45.24	1	0.416	Nm	OK	0.66	TIME	OK	OK
2020/01/14 11:27:26.30	1	0.412	Nm	NG	0.31	TIME	OK	NG
2020/01/14 11:27:20.80	1	0.701	Nm	NG	0.17	TIME	OK	NG
2020/01/14 11:27:13.80	1	0.403	Nm	NG	0.70	TIME	OK	NG
2020/01/14 11:26:45.10	1	0.409	Nm	OK	0.62	TIME	NG	NG
2020/01/14 11:26:41.91	1	0.416	Nm	OK	0.31	TIME	OK	OK
2020/01/14 11:26:38.60	1	0.414	Nm	OK	0.66	TIME	NG	NG
2020/01/14 11:26:18.93	1	0.416	Nm	OK	0.76	TIME	OK	OK
2020/01/14 11:26:13.99	1	0.410	Nm	OK	0.49	TIME	OK	OK



The period setting dialog is displayed.

2 Designate the display start date/time and end date/time.

The date/time can be designated in the calendar that is displayed by clicking .



Period setting

2020/01/01  00 : 00 ~ 2020/01/18  00 : 00

OK CANCEL

3 Click the [OK] button.

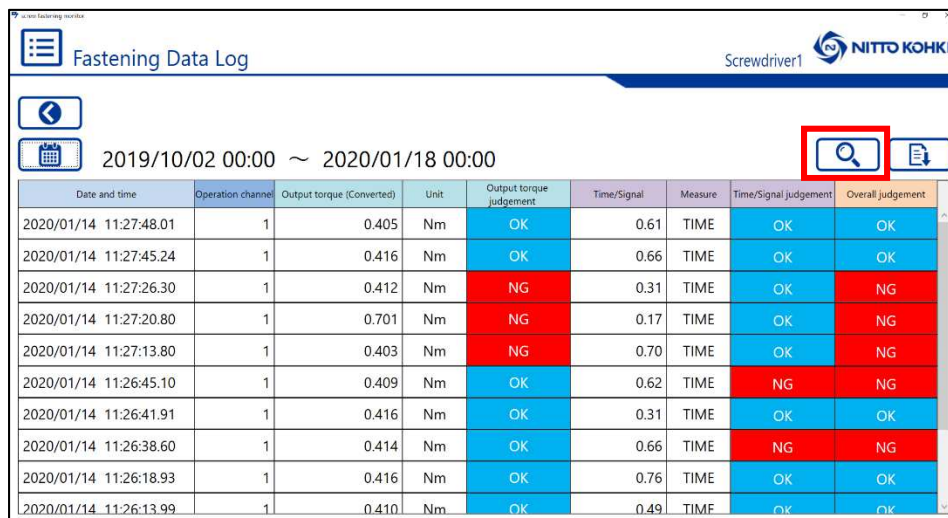
A list of operations within the designated period is displayed in the [Fastening Data Log] screen.

Filtering displayed operations

Filter operations according to set conditions, and display the result as a list.

1 Click .

The filter dialog is displayed.



Date and time	Operation channel	Output torque (Converted)	Unit	Output torque judgement	Time/Signal	Measure	Time/Signal judgement	Overall judgement
2020/01/14 11:27:48.01	1	0.405	Nm	OK	0.61	TIME	OK	OK
2020/01/14 11:27:45.24	1	0.416	Nm	OK	0.66	TIME	OK	OK
2020/01/14 11:27:26.30	1	0.412	Nm	NG	0.31	TIME	OK	NG
2020/01/14 11:27:20.80	1	0.701	Nm	NG	0.17	TIME	OK	NG
2020/01/14 11:27:13.80	1	0.403	Nm	NG	0.70	TIME	OK	NG
2020/01/14 11:26:45.10	1	0.409	Nm	OK	0.62	TIME	NG	NG
2020/01/14 11:26:41.91	1	0.416	Nm	OK	0.31	TIME	OK	OK
2020/01/14 11:26:38.60	1	0.414	Nm	OK	0.66	TIME	NG	NG
2020/01/14 11:26:18.93	1	0.416	Nm	OK	0.76	TIME	OK	OK
2020/01/14 11:26:13.99	1	0.410	Nm	OK	0.49	TIME	OK	OK

2 Set the filtering conditions.



Item	Condition
Operation channel	1 to 30, NONE
Output torque	OK, NG, NONE
Time/Signal judgement	OK, NG, NONE
Overall judgement	OK, NG, NONE

3 Click the [OK] button.

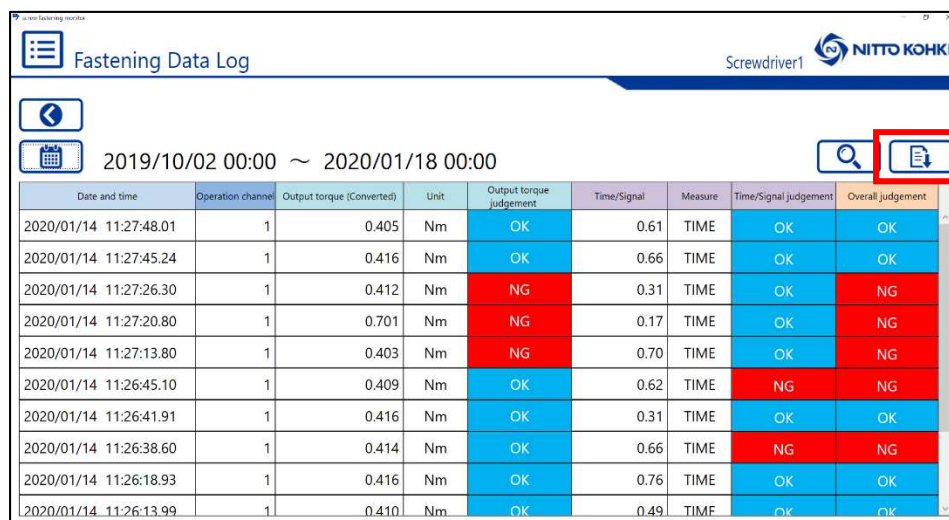
A list of operations that match the set filter conditions is displayed in the [Fastening Data Log] screen.

Exporting CSV files

Operation data currently displayed in the list can be saved as a CSV file.

1 Click .

The export dialog is displayed.



Fastening Data Log

Screwdriver1 NITTO KOHKI

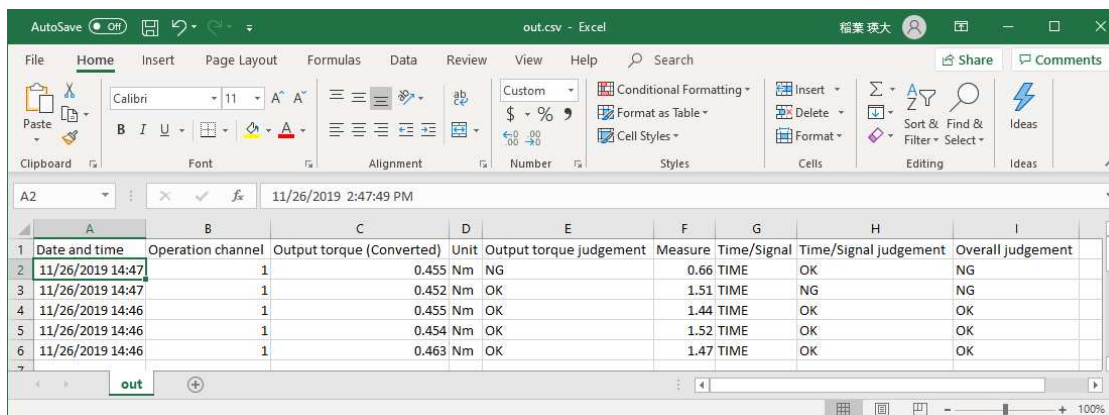
2019/10/02 00:00 ~ 2020/01/18 00:00

Date and time	Operation channel	Output torque (Converted)	Unit	Output torque judgement	Time/Signal	Measure	Time/Signal judgement	Overall judgement
2020/01/14 11:27:48.01	1	0.405	Nm	OK	0.61	TIME	OK	OK
2020/01/14 11:27:45.24	1	0.416	Nm	OK	0.66	TIME	OK	OK
2020/01/14 11:27:26.30	1	0.412	Nm	NG	0.31	TIME	OK	NG
2020/01/14 11:27:20.80	1	0.701	Nm	NG	0.17	TIME	OK	NG
2020/01/14 11:27:13.80	1	0.403	Nm	NG	0.70	TIME	OK	NG
2020/01/14 11:26:45.10	1	0.409	Nm	OK	0.62	TIME	NG	NG
2020/01/14 11:26:41.91	1	0.416	Nm	OK	0.31	TIME	OK	OK
2020/01/14 11:26:38.60	1	0.414	Nm	OK	0.66	TIME	NG	NG
2020/01/14 11:26:18.93	1	0.416	Nm	OK	0.76	TIME	OK	OK
2020/01/14 11:26:13.99	1	0.410	Nm	OK	0.49	TIME	OK	OK

2 Designate the output destination of the CSV file.

The CSV file is saved to the designated directory.

Content of CSV file



AutoSave Off out.csv - Excel

	A	B	C	D	E	F	G	H	I
	Date and time	Operation channel	Output torque (Converted)	Unit	Output torque judgement	Measure	Time/Signal	Time/Signal judgement	Overall judgement
2	11/26/2019 14:47	1	0.455	Nm	NG	0.66	TIME	OK	NG
3	11/26/2019 14:47	1	0.452	Nm	OK	1.51	TIME	NG	NG
4	11/26/2019 14:46	1	0.455	Nm	OK	1.44	TIME	OK	OK
5	11/26/2019 14:46	1	0.454	Nm	OK	1.52	TIME	OK	OK
6	11/26/2019 14:46	1	0.463	Nm	OK	1.47	TIME	OK	OK

6. List of Messages

[System Setting] screen

Type	Message	Display timing	Solution
Confirmation	Cancel changes in system settings?	At transition to another screen of the Screw Fastening Monitor Software	—
	Change language setting? [XXXX*1] *1: Newly changed language is displayed	At setting of the display language	—
Warning	Device name is not set.	At setting of the name of the screw fastening monitor	Enter the name of the screw fastening monitor.
	Incorrect setting of trial numbers at Torque conversion factor measurement.	At setting of the output torque measurement count for calculation of the torque conversion factor	Set the correct count.
	Incorrect save location setting of Data Log file (automatic output).	At setting of automatic output of the fastening data log file	Set the correct output destination.
	The effective range is not set correctly.	At setting of the unit and effective range of output torque values	Set the correct range.
	If the tightening unit is changed, all channel settings will be initialized. Is it OK?	At setting of the unit and effective range of output torque values	—
	When the measurement method is changed, the judgment value of the time/rotation signal of all channels will be initialized. Is it OK?	At setting of the value measurement method	—
Error	Failed to save equip name.	At setting of the name of the screw fastening monitor	Execute the save again.
	Failed to save language setting.	At setting of the display language	Execute the save again.
	Failed to save trial number setting when measuring torque conversion coefficient.	At setting of the output torque measurement count for calculation of the torque conversion factor	Execute the save again.
	Failed to save fastening Data Log file (automatic output) setting.	At setting of automatic output of the fastening data log file	Execute the save again.
	Setting update failed.	At setting of the unit and effective range of output torque values	Execute the save again.
	Failed to save measuring method.	At setting of the value measurement method	Execute the save again.
Information	Language setting changed. Setting will be applied from next start up.	At setting of the display language	—

[Communication setting] screen

Type	Message	Display timing	Solution
Confirmation	Cancel changes in communication settings?	At transition to another screen of the Screw Fastening Monitor Software	—
Warning	Incorrect setting of standby IP for the screw fastening monitor.	At setting of the screw fastening monitor communication	Set the correct standby IP.
	Incorrect setting of standby port for the screw fastening monitor.	At setting of the screw fastening monitor communication	Set the correct standby port.
	Incorrect setting of connection destination IP for the screw fastening monitor.	At setting of the screw fastening monitor communication	Set the correct connection destination IP.
	Incorrect setting of connection destination port for the screw fastening monitor.	At setting of the screw fastening monitor communication	Set the correct connection destination port.
Error	Failed to save communication setting of screw fastening monitor.	At setting of the screw fastening monitor communication	Execute the save again.
	Failed to save communication setting of torque checker.	At setting of torque checker communication	Execute the save again.

[Torque conversion] screen

Type	Message	Display timing	Solution
Confirmation	CH[XX*1] Cancel changes in Torque conversion factor? *1: No. of operation channel received from the screw fastening monitor	At transition to another screen of the Screw Fastening Monitor Software	—
	CH[XX*1] Torque conversion factor [YYYY*2] Cancel changes in Torque conversion factor? *1: No. of operation channel received from the screw fastening monitor *2: Calculated torque conversion factor	At transition to another screen of the Screw Fastening Monitor Software	—
	The number of trials has not been met. Do you want to register the torque conversion factor?	At calculation of the torque conversion factor	—
	Do you want to discard changes in torque conversion?	At deletion of values	—
	Reset all values displayed on Torque conversion factor measurement screen?	At batch deletion of values	—
Error	Failed to save Torque conversion factor.	At registration of the torque conversion factor	Execute the save again.
	File output failed.	At export of the measurement list as a CSV file	Execute export again.
Warning	Incorrect setting of torque checker measurement value. [-99.999 ~ 99.999]	At manual entry of values	Set the correct values.
	Incorrect setting of screw fastening monitor converted current value. [1 ~ 99999]	At manual entry of values	Set the correct values.
	There is no data to be saved.	At export of the measurement list as a CSV file	Execute export with data currently displayed in the measurement list.
Notification	The number of setting trials has been reached.	At calculation of the torque conversion factor	—
	File output is complete.	At export of the measurement list as a CSV file	—

[Judgment value setting] screen

Type	Message	Display timing	Solution
Confirmation	Cancel changes in judgment value?	At transition to another screen of the Screw Fastening Monitor Software	—
Warning	Incorrect setting of Torque conversion factor. [0.0000000001 ~ 9.999999999]	At setting of judgment values	Set the correct values.
	Incorrect setting of the output torque lower limit. [XXXX ~ YYYY]*1 *1: Range according to the torque checker unit setting	At setting of judgment values	Set the correct values.
	Incorrect setting of the output torque upper limit. [XXXX ~ YYYY] *1: Range according to the torque checker unit setting	At setting of judgment values	Set the correct values.
	Incorrect setting of lower and upper limit of output torque.	At setting of judgment values	Set the correct values.
	Incorrect setting in fastening time lower limit. [0 ~ 9.99]	At setting of judgment values	Set the correct values.
	Incorrect setting in fastening time upper limit. [0 ~ 9.99]	At setting of judgment values	Set the correct values.
	Incorrect setting in fastening time lower and upper limit.	At setting of judgment values	Set the correct values.
	Incorrect setting in signal lower limit. [0 ~ 60000]	At setting of judgment values	Set the correct values.
	Incorrect setting in signal upper limit. [0 ~ 60000]	At setting of judgment values	Set the correct values.
	Incorrect setting in signal lower and upper limit.	At setting of judgment values	Set the correct values.
Error	Failed to save judgment value.	At setting of judgment values	Execute the save again.

[Fastening Data Log] screen

Type	Message	Display timing	Solution
Warning	Incorrect period setting. [From XXXX* ¹ ~ To YYYY* ²] *1: Designated display start date/time *2: Designated display end date/time	At setting of the display period	Set correct dates/times to each of the display start date/time and display end date/time.
	Data Log does not exist.	At export of the data log as a CSV file	Execute export with data currently displayed in the data log list.
Information	The displayed fastening Data Log is saved.	At export of the data log as a CSV file	—
Error	Failed to download fastening Data Log file.	At export of the data log as a CSV file	Execute export again.