Mitutoyo

Inspection Certificate Creation and System Setting Editing Software for LH-600F/FG Linear Height High-precision 2D Measurement System

LH Communication-Tool V1.0

User's Manual

- Instructions for use -

Read this document thoroughly before operating the product.
After reading, retain it close at hand for future reference.
This English language version of the document contains the original instructions.

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■ Product names and model numbers covered in this document

Product name	Model number
Inspection Certificate Creation and System Setting Editing Software for LH-600F/FG Linear Height High-precision 2D Measurement System	LH Communication-Tool V1.0

■ Notice regarding this document

- Mitutoyo Corporation assumes no responsibilities for any damage to the product, caused by its use not conforming to the procedure described in this document.
- Read this document thoroughly before operating the software. In particular, be sure to fully understand "Precautions for Use" on page 6.
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About This Document

■ Positioning of this document, document map

This describes the positioning of this document and its relationship with other installments.

IMPORTANT

Before you use LH Communication-Tool (referred to as "this software" in this document), first read the separate "LH-600F/FG User's Manual" to understand how to operate LH-600F/FG.

● For hardware

Instruction Manual	Explains the safety precautions, overview, components, specifications, etc. of LH-600F/FG.
Hardware Guide	Explains the specifications, setup, maintenance, troubleshooting, etc., for the hardware of LH-600F/FG.

● For operation methods and software

User's Manual	Explains the fundamentals, basic and advanced measurements, troubleshooting, etc., for LH-600F/FG.
LH Communication-Tool User's Manual (This document)	Explains the procedures for reading measurement data from LH-600F/FG, creating an inspection certificate, etc., on a PC with this software installed. Download this software from the Mitutoyo home page.

● For setup

Setup Manual	Explains how to unpack and place LH-600F/FG, how to mount probes, etc.
Quick Start Guide	Explains the procedure for starting LH-600F/FG and performing a basic measurement.

■ Intended readers and purpose of this document

● Intended readers

This document is intended for users of LH-600F/FG.

The readers are assumed to have been familiar with basic operations on a PC and Windows.
They are also assumed to be able to understand individual instructions by reading the described drawings.

● Purpose

The purpose of this document is to help you to understand how to use this software to perform tasks such as creating inspection certificates from LH-600F/FG measurement data and editing LH-600F/FG system settings and tolerance settings on a PC.

Conventions Used in This Document

■ Safety reminder conventions warning against potential hazards

NOTICE	Indicates a situation which, if not avoided, **may result in property damage**.

■ Conventions indicating referential information or reference location

IMPORTANT	Indicates information that must be known when using this software.
Tips	Indicates further information and details relevant for the operating methods and procedures that are explained in that section.
	Indicates reference location if there is information that should be referred to in this document or an extraneous User's Manual. Example: For details about XX, see "1.1 Name of Each Part" on page 5 in "1 Overview".

■ Other conventions

( ): Round brackets	Represent a paraphrase of an immediately preceding phrase or a supplementary explanation.
" ": Double quotation marks	Represent a highlighted phrase. They also indicate an index where information to be referenced is described.
[ ]: Square brackets	Represent a menu name on the screen, screen name, dialog name, button, display item, tab name, or key on the controller or keyboard. They also indicate an item to be purposely entered or selected by the customer.
1, 2, 3 … 1, 2, 3…	Indicates the order and the contents of tasks. (1 : indicates main tasks, 1 : indicates detailed tasks)
»	Indicates the action resulted from some operation(s).

Precautions for Use

■ Use and handling of the software

- Use this software only with LH-600F/FG.

  Do not use it with measuring instruments other than LH-600F/FG.

- This software is for creating inspection certificates and editing system settings for LH-600F/FG.

  Do not use it for any purpose other than the above.

■ Precautions for when connected to LH-600F/FG

IMPORTANT

While LH-600F/FG is connected with a USB cable to a PC on which this software is installed, operations cannot be performed with the LH-600F/FG display unit.

To operate LH-600F/FG from the display unit, follow the procedures in this document to exit the software, or disconnect the USB cable.

For details about how to exit this software, see "3.3 Exiting" on page 25.

■ Precautions for turning off the PC

IMPORTANT

When you turn off the power to the PC, follow the procedure in this document for exiting the software.

Improper operation could result in loss of data in the software or data on the connected LH-600F/FG.

■ Precautions for backing up important data

IMPORTANT

Periodically back up important data, such as measurement data and system settings, to external media.

Data saved on a PC can be corrupted or lost due to a variety of reasons. Mitutoyo cannot be responsible for corrupted or lost measurement data, system settings, etc., for any reason.

Third-Party Licenses

ComponentOne

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1 Overview

This software is for creating inspection certificates using data obtained from LH-600F/FG and for saving, editing, and transferring settings data.

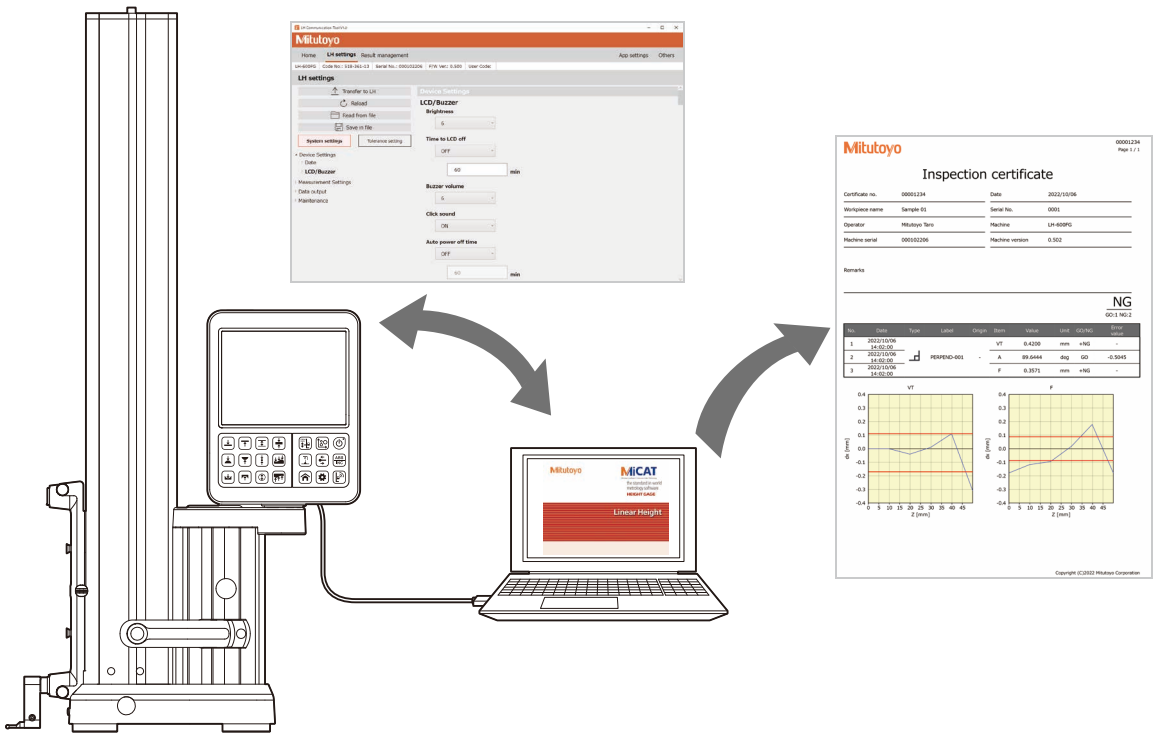
By simply connecting a PC on which this software is installed to LH-600F/FG with a USB cable and starting this software, you can establish a connection with LH-600F/FG.

See the following table for the data that this software handles.

Data		Description
Measurement result data		Measurement result data from simple measurement, advanced measurement, 2D measurement, and part program measurement. This data includes the measurement origin, measurement type, measurement items, measured values, GO/NG judgment results, etc.
Main unit setting data		
	System settings	This data includes the settings for the measuring instrument main unit (hereinafter referred to as the main unit) and the display unit, measurement settings, data output settings, and maintenance (calibration) settings.
	Tolerance settings	This data includes the GO/NG judgment warning threshold and the tolerance settings (nominal value, upper tolerance, and lower tolerance) for each measurement item.

Tips

- The following USB cable is necessary to connect LH-600F/FG and a PC.
  USB cable (A type–B type): A type (PC), B type (LH-600F/FG)
- To purchase a Mitutoyo optional USB cable (Part No. 12BAF812), please contact a Mitutoyo sales office "SERVICE NETWORK" on page App-1.



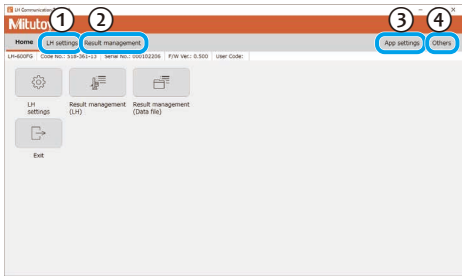
MEMO

2 Explanation of the Screens

This software consists of six screens, organized by function.

1 [Home] screen

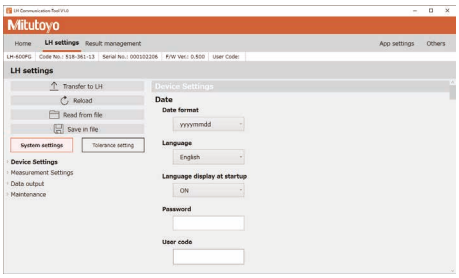
This screen is displayed first when the software is started.
[Exit] and shortcut buttons to other screens are located here.
"■ [Home] screen" on page 11



Clicking ① displays the [LH settings] screen.
Clicking ② displays the [Result management] screen.
Clicking ③ displays the [App settings] screen.
Clicking ④ displays the [Others] screen.

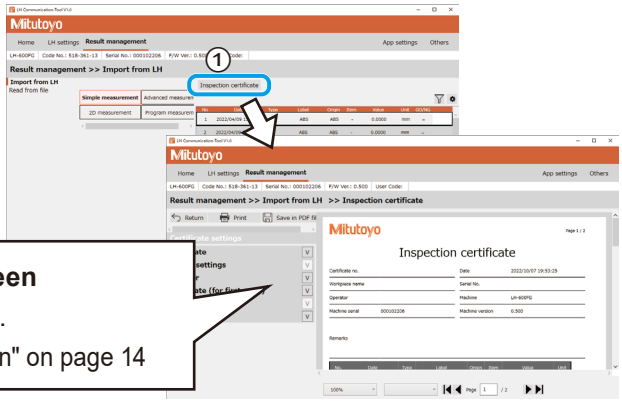
2 [LH settings] screen

The LH-600F/FG system settings and tolerance settings are displayed.
"■ [LH settings] screen" on page 12



3 [Result management] screen

Measurement result data in LH-600F/FG is displayed.
Clicking ① displays the [Inspection certificate] screen.
"■ [Result management] screen" on page 13

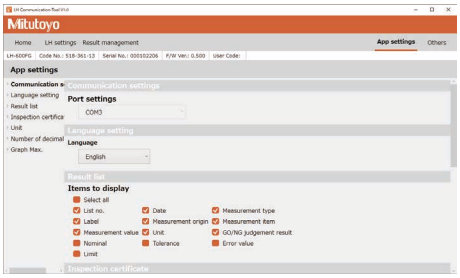


4 [Inspection certificate] screen

Create an inspection certificate.
"■ [Inspection certificate] screen" on page 14

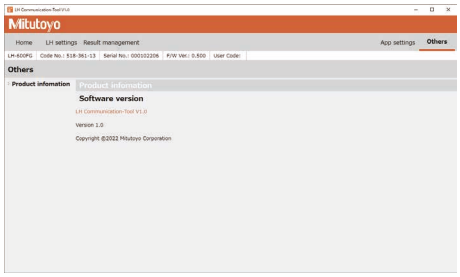
5 [App settings] screen

The settings for this software are displayed.
"■ [App settings] screen" on page 16

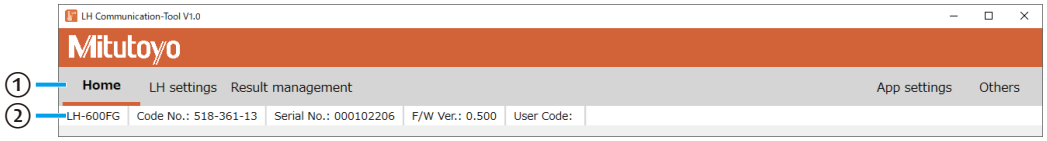


6 [Others] screen

Information such as the version of this software is displayed.
"■ [Others] screen" on page 17



■ Items common to all screens

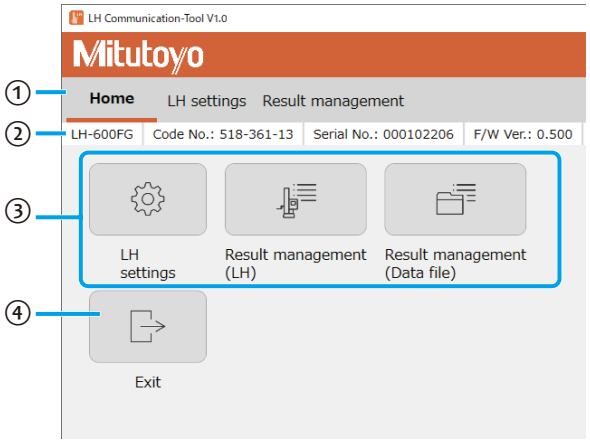


No.	Name	Description
①	Navigation bar	Links to each function (menu items). Clicking a menu item displays the screen for the corresponding function ([Home] screen, [LH settings] screen, and [Result management] screen). **Tips** An orange underline is displayed under the currently selected (currently displayed) menu name. Result management
②	Information bar for the connected device	If this software is connected to LH-600F/FG (online mode), the following five pieces of information are displayed. • Model name (LH-600F or LH-600FG) • Code No. • Serial No. • F/W Ver. (*) • User Code * F/W (software) Ver.: The version of the software included on LH-600F/FG. **Tips** If there is no connection with LH-600F/FG (offline mode), the following message is displayed. ⚠ The machine is not connected

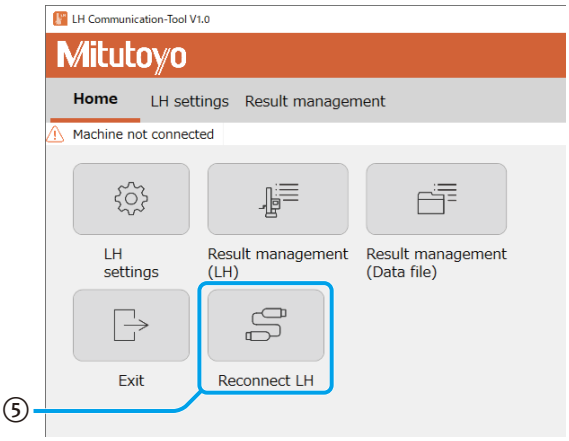
■ [Home] screen

This screen is displayed first when the software is started.
If there is a connection with LH-600F/FG (online mode), the screen on the left is displayed.
If there is no connection with LH-600F/FG (offline mode), the screen on the right is displayed.

Online mode



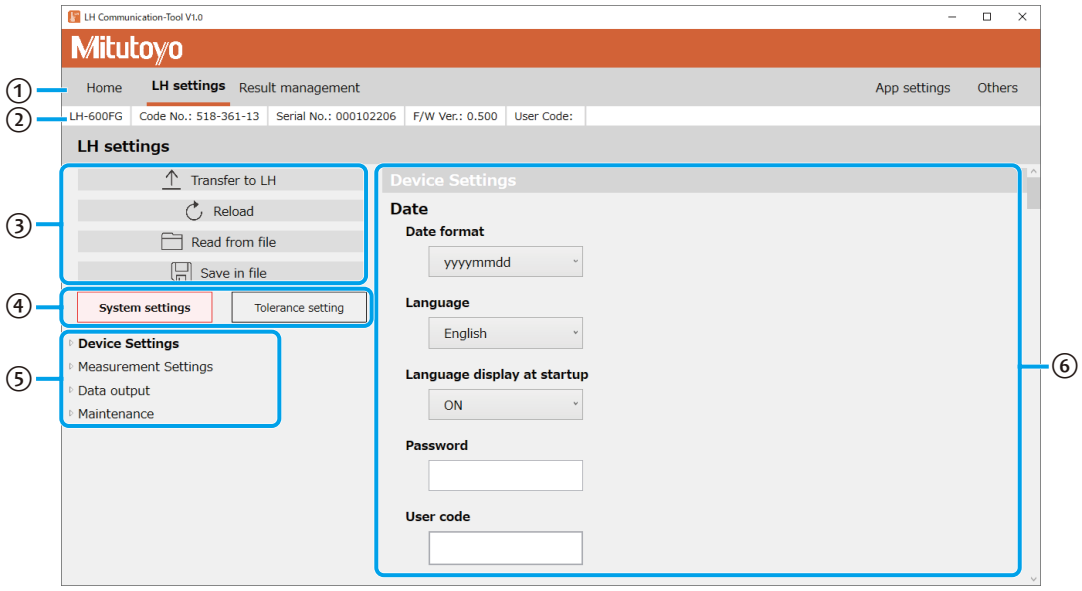
Offline mode



No.	Name	Description
①	Navigation bar	For details, see "■ Items common to all screens" on page 10.
②	Information bar for the connected device	
③	Shortcut buttons	Shortcut buttons to the following functions. • [LH settings]: Edit the LH-600F/FG system settings. • [Result management (LH)]: Read the measurement result list from LH-600F/FG. • [Result management (Data file)]: Read the measurement result list from a file saved on the PC.
④	[Exit]	Clicking this button exits the software.
⑤	[Reconnect LH]	Displayed in offline mode. After you connect LH-600F/FG to the PC with a USB cable and click [Reconnect LH], the software switches to online mode. When the software switches to online mode, the data on the LH-600F/FG is read into the software. **Tips** This software also switches to online mode after you connect LH-600F/FG to the PC with the USB cable and restart the software.

■ [LH settings] screen

The LH-600F/FG system settings and tolerance settings are displayed.
You can write edited data back to LH-600F/FG or save it on the PC.

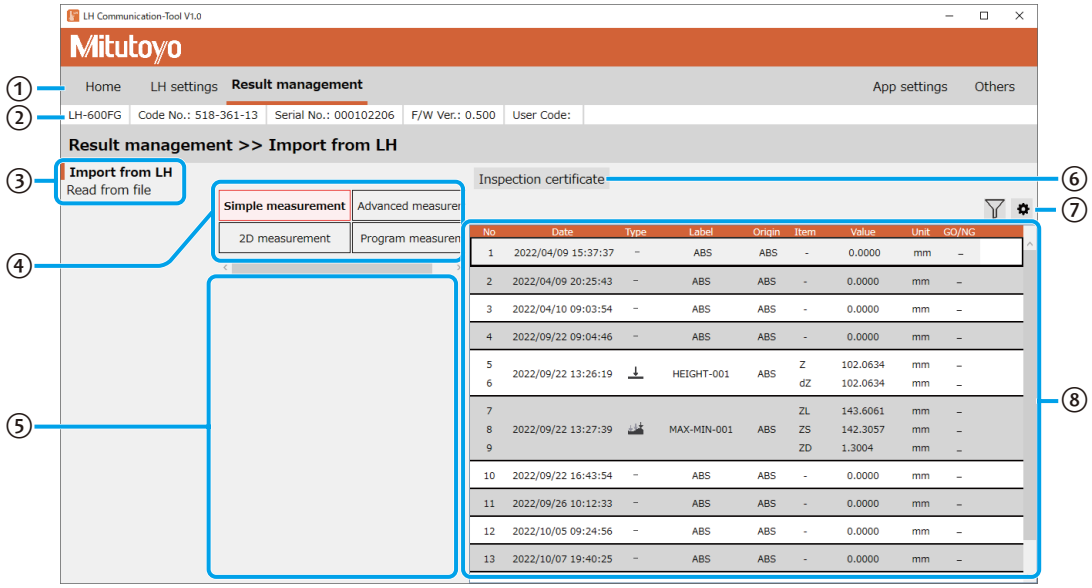


No.	Name	Description	
①	Navigation bar	For details, see "■ Items common to all screens" on page 10.	
②	Information bar for the connected device		
③	Data read/write buttons	These buttons are used to read or write data.	
		[Transfer to LH] (displayed in online mode)	Write data that was edited with this software to LH-600F/FG.
		[Reload] (displayed in online mode)	Read the data on LH-600F/FG again.
		[Read from file]	Read the system settings and tolerance settings from a file that is saved on the PC.
		[Save in file]	Save the system settings and tolerance settings on the PC.
④	Data selection buttons	Select [System settings] or [Tolerance setting]. The selected settings data is displayed in the area indicated by ⑥.	
⑤	Data list	The top-level items for [System settings] or [Tolerance setting] selected in ④ are displayed. Clicking ▷ displayed in front of an item displays the sub items in a tree view.	
⑥	Data setting display area	The settings for the data displayed in ⑤ are displayed.	

■ [Result management] screen

Measurement result data in LH-600F/FG is displayed.

You cannot edit the measurement result data, but you can select the necessary items and load them into an inspection certificate.



No.	Name	Description
①	Navigation bar	For details, see "■ Items common to all screens" on page 10.
②	Information bar for the connected device	
③	Read data buttons	[Import from LH] (online mode only): Read the measurement result data from LH-600F/FG.
		[Read from file]: Read the measurement result data from a USB memory device that is connected to LH-600F/FG.
④	Data selection buttons	If [Import from LH] is selected in ③: [Simple measurement], [Advanced measurement], [2D measurement], and [Program measurement] are displayed. The content corresponding to the selected measurement is displayed in ⑧.
		If [Read from file] is selected in ③: Click [Read from file], and select a file (a plain-text file) that is saved on the PC. The content corresponding to the selected measurement is displayed in ⑧.
⑤	Data file selection area	If [Import from LH] is selected in ③ and [2D measurement] is selected in ④: The [Select result] list (list of measurement results files) is displayed.
		If [Import from LH] is selected in ③ and [Program measurement] is selected in ④: The [Select program] drop-down list and [Select result] list (list of measurement results files) are displayed.
		If [Read from file] is selected in ③: [File name], [File location], and [List type] for the file selected in ③ are displayed. [Label], [Note], and [Select result] are also displayed depending on the selected file.

No.	Name	Description
⑥	[Inspection certificate]	Display an inspection certificate that contains the measurement result data that is displayed in ⑧.
⑦	Filter	button: Select a measurement result type to display in ⑧. button: Select the measurement result items to display in ⑧.
⑧	Measurement result data display area	The measurement result data that is selected in ④ and ⑤ is displayed.

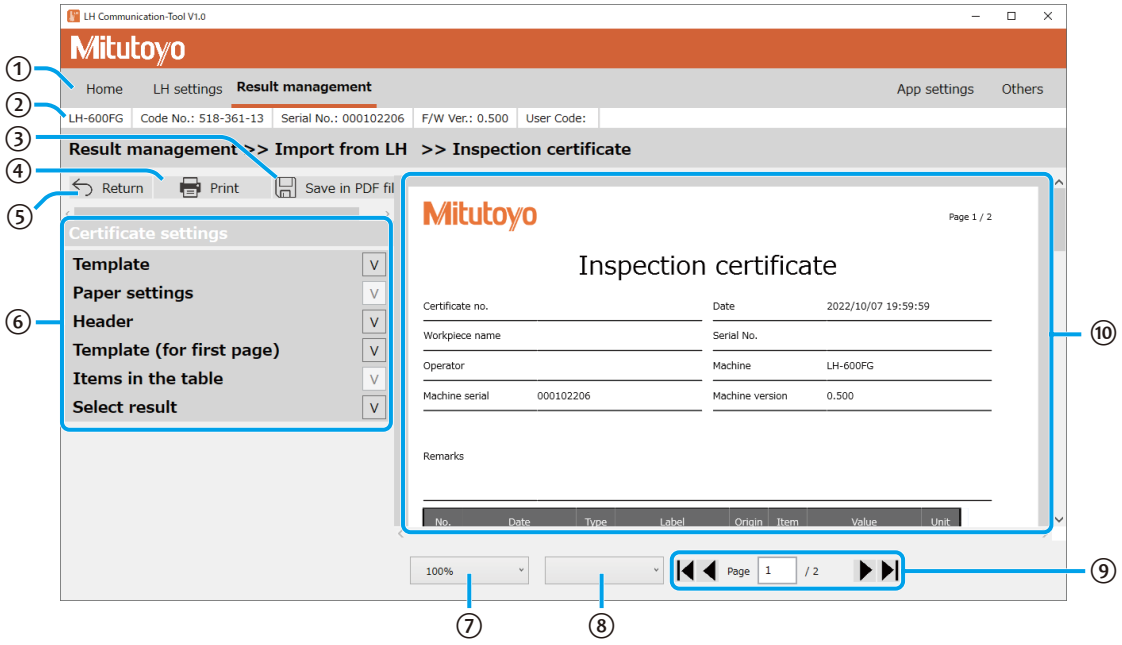
■ [Inspection certificate] screen

An inspection certificate that contains the measurement result data from LH-600F/FG is displayed.

To display this screen, click [Inspection certificate] on the [Result management] screen.

You can adjust the layout with the setting buttons on the left side of the screen while checking the results of the adjustments in the preview area on the right side of the screen.

The completed inspection certificate can be printed or saved as a PDF file.

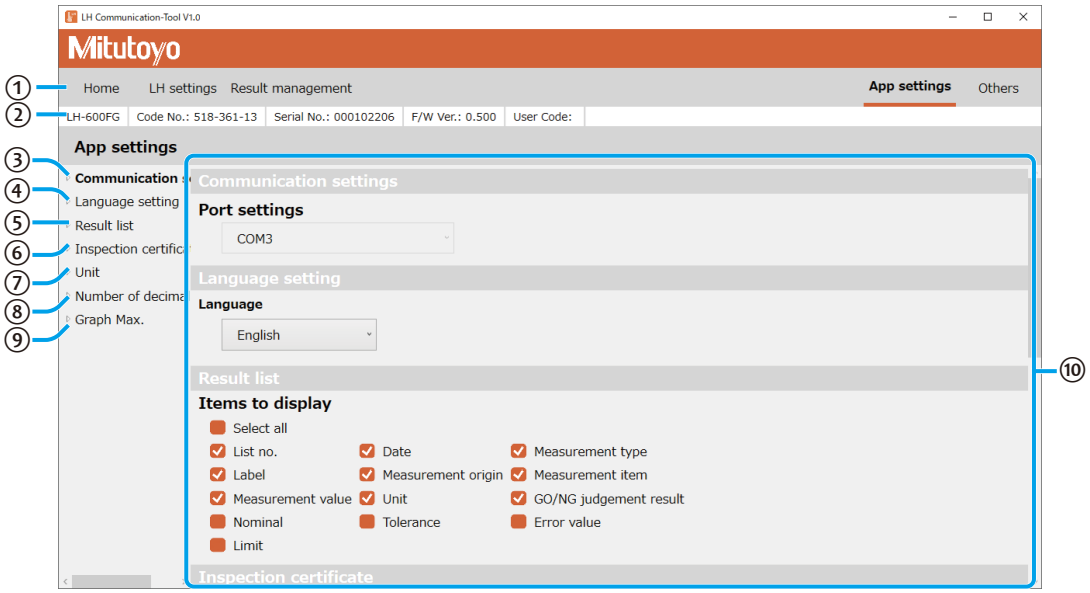


No.	Name	Description
①	Navigation bar	For details, see "■ Items common to all screens" on page 10.
②	Information bar for the connected device	
③	[Save in PDF file]	Convert the inspection certificate to a PDF file, and save it on the PC.
④	[Print]	Print the inspection certificate with a printer that is connected to the PC or with a virtual printer on the PC. Select the print media with the print media selection button ⑧, and click [Print].
⑤	[Return]	Return to the [Result management] screen.
⑥	Layout adjustment area	Adjust the print layout or display of items on the inspection certificate with the display ( ) / hide ( ) buttons. You can also select a template to simplify the layout adjustments. The results of the adjustments are reflected in ⑩, the preview area.

No.	Name	Description
⑦	Display magnification selection button	Select the magnification for the preview area from the drop-down list.
⑧	Print media selection button	Select the print media. After you select the print media and click [Print] ④, the inspection certificate will be printed on the selected media. **Tips** Printer, OneNote, Microsoft XPS Document Writer, Adobe PDF, etc., can be selected as the print media.
⑨	Page selection buttons	Select which page to display in the preview area. **Tips** The displayed page can also be scrolled by dragging the scrollbar on the right of the preview area.
⑩	Preview area	Displays the results of adjustments made in ⑥.

■ [App settings] screen

Configure the settings for this software, such as the port number, language, and units.
Click the [App settings] menu item in the navigation bar to display this screen.



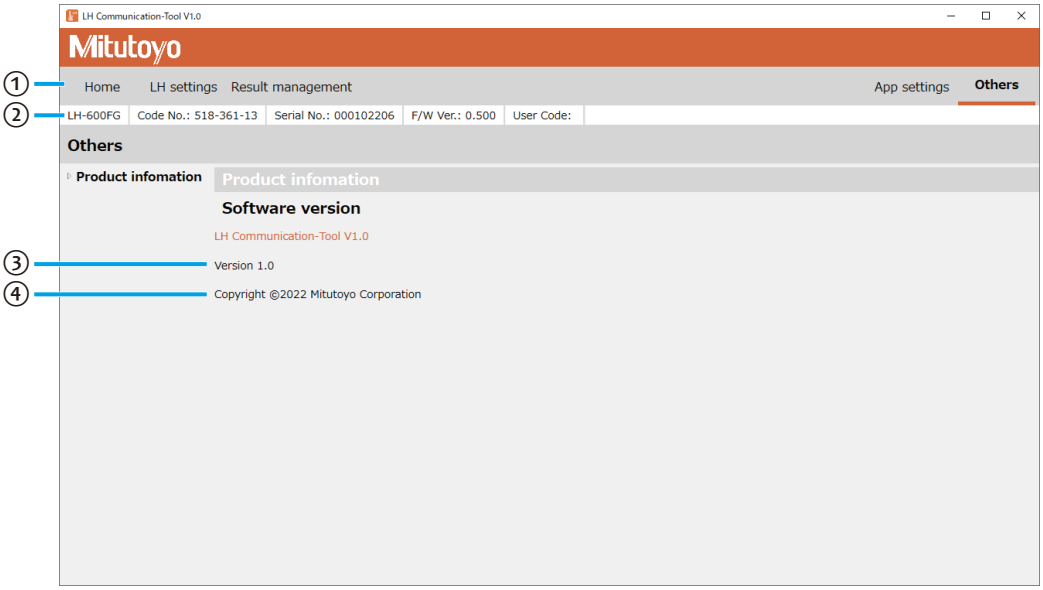
No.	Name	Description
①	Navigation bar	For details, see 📖 "■ Items common to all screens" on page 10.
②	Information bar for the connected device	
③	[Communication settings]	Displays the port number of the connected PC. Nothing is displayed if the USB cable is not connected. For details, see 📖 "■ Checking the connection port" on page 24.
④	[Language setting]	Set which language is displayed in the app. You can select from 21 languages. The initial value is [English].
⑤	[Result list]	Set which items to display in the measurement result list. The values set here are linked to the items to display (selected with the ⚙ button) that you set on the [Result management] screen.
⑥	[Inspection certificate]	Set which language is used on the inspection certificate. You can select [Same as app settings] or from 21 languages. The initial value is [Same as app settings].
⑦	[Unit]*1	Set the unit to use for angles. You can select [deg], [rad], or [DMS] (degrees, minutes, seconds). The initial value is [deg]. The unit for length can also be set.*2 You can select [in] or [mm]. The initial value is [mm].
⑧	[Number of decimal digits]*1	Set the number of decimal places after the decimal point for angles and lengths. You can select [0.0], [0.00], [0.000], or [0.0000] for both angles and lengths. The initial value is [0.0000].
⑨	[Graph Max.]	Set the maximum value for the vertical axis in the perpendicularity (VT) and straightness (F) graphs. The initial value is [0.0000].
⑩	Settings display area	The area for viewing and editing the settings in ③ to ⑨.

*1 The [Unit] setting applies only to measurement results displayed on the [Import from LH] screen in the [Result management] screen.
It does not apply to measurement results displayed on the [Read from file] screen or to the contents of the [System settings]/[Tolerance setting] settings on the [LH settings] screen.

*2 [Length unit] is not displayed if the language and region settings of the Windows OS are set to Japan or Korea.

■ [Others] screen

On this screen, you can check the version of the software and copyright information.
Click the [Others] menu item in the navigation bar to display this screen.



No.	Name	Description
①	Navigation bar	For details, see "■ Items common to all screens" on page 10.
②	Information bar for the connected device	
③	Version information	Displays the version of this software.
④	Copyright information	Displays the copyright holder of this software.

MEMO

3 Setup

This chapter explains how to set up this software, from installation to connection with LH-600F/FG.

3.1 Installation 20
3.2 Connection and Startup 21
3.3 Exiting 25

3.1 Installation

This section explains how to install this software.
The PC on which you will install this software must meet the following specifications.

Operating system	Windows 10 (64 bit) Windows 11 (64 bit)
Display	Resolution of 1,280 x 720 or higher (recommended)

1 **Log into the PC with administrator privileges.**

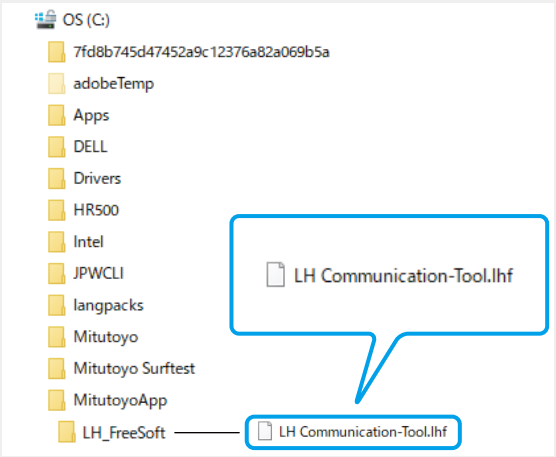
2 **Download the software from the Mitutoyo home page.**

3 **Decompress the compressed file (ZIP format) on the PC.**

This completes the installation of the software.

Tips

If this software has been previously started up, there is an "LH Communication-Tool.lhf" settings file in the "LH_FreeSoft" folder.
After you complete step **3**, delete the "LH Communication-Tool.lhf" settings file.



3.2 Connection and Startup

After installation of the software is complete, connect the PC and LH-600F/FG. Then, after you start up the software, you will be able to use it in online mode.

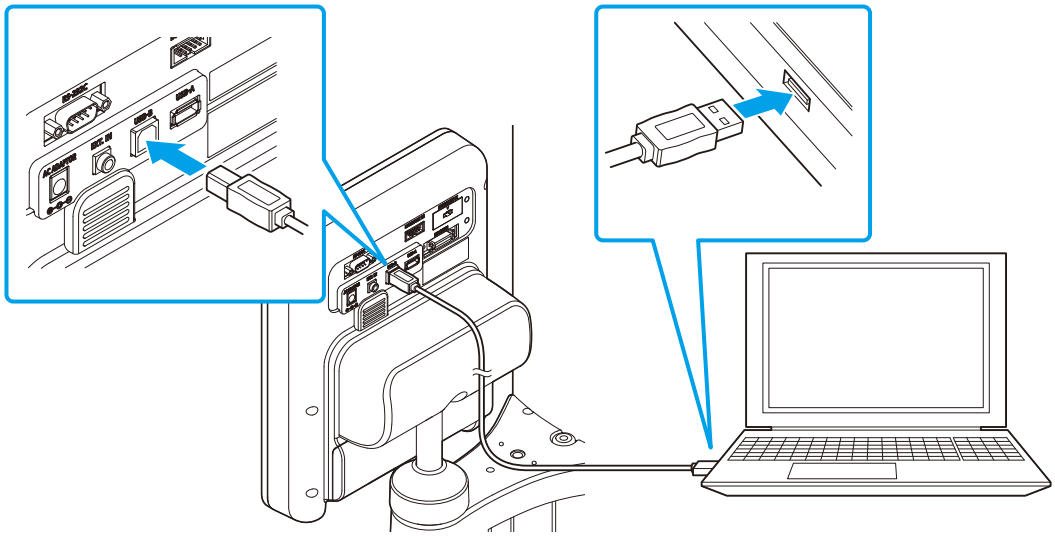
This section explains how to connect to LH-600F/FG and how to start up the software in online mode.

1 Turn on the PC and LH-600F/FG.

Tips

If the PC and LH-600F/FG are turned on, proceed to step 2.

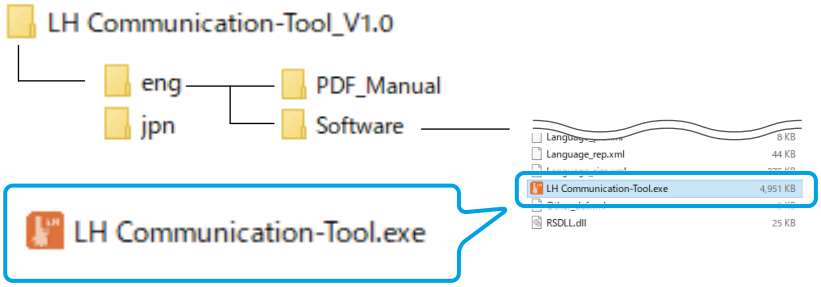
2 Connect the PC and LH-600F/FG with a USB cable (A–B type).



3 On the LH-600F/FG display unit, navigate to the home screen.

4 Start up the software.

1 Double-click "LH Communication-Tool.exe" (or right-click it and click [Open]).
"LH Communication-Tool.exe" is located in the "Software" folder in each language folder in the "LH Communication-Tool_V1.0" folder that was decompressed on the PC.



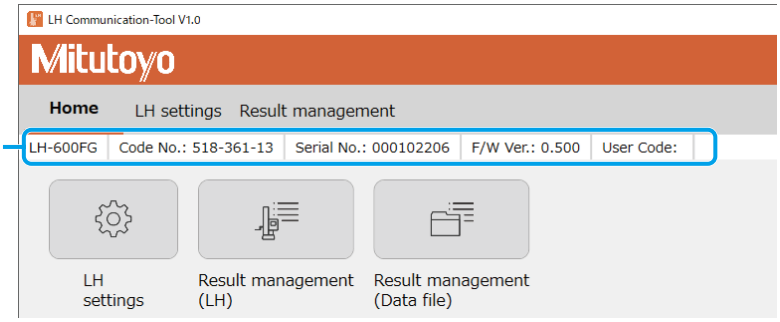
Tips

This manual is stored in PDF format in the "PDF_Manual" folder.

» The [Home] screen is displayed.

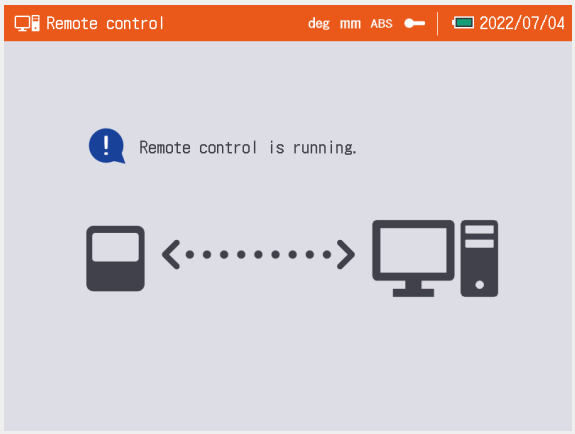
» Information about the connected LH-600F/FG is displayed in the information bar for the connected device on the [Home] screen. (Online mode)

Information bar for the connected device



IMPORTANT

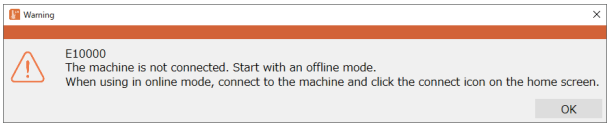
- If the software is not in online mode, the USB cable might not be connected correctly.
  See "■ Checking the connection port" on page 24, and check that the USB cable is connected correctly.
- While LH-600F/FG is connected with a USB cable to a PC on which this software is installed, the following screen is displayed on the touch screen of the LH-600F/FG display unit. During this time, operations cannot be performed with the LH-600F/FG display unit.
  To operate LH-600F/FG from the display unit, exit the software, or disconnect the USB cable.
  For details about how to exit this software, see "3.3 Exiting" on page 25.



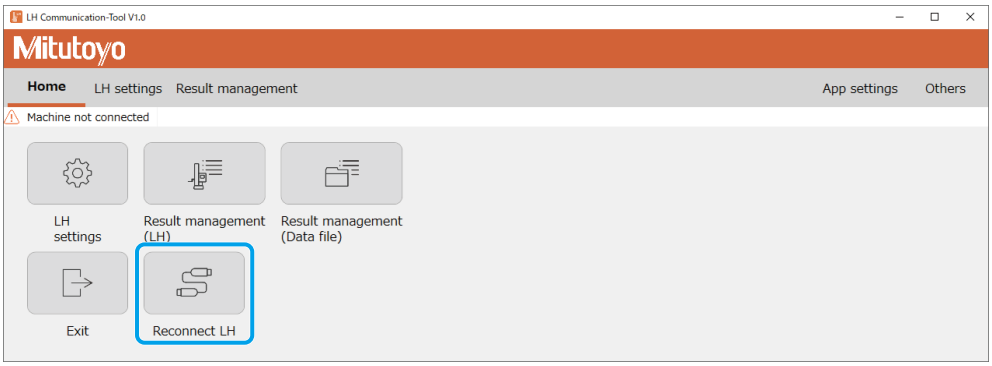
■ If this software is started without connecting the PC and LH-600F/FG

If this software is started without connecting the PC and LH-600F/FG, the following error message is displayed, and the software will start in offline mode.

In offline mode, only files that are saved on the PC or on a USB memory device can be used.



To switch the software from offline mode to online mode, connect the PC and LH-600F/FG with a USB cable, and then click [Reconnect LH] on the [Home] screen.



■ Checking the connection port

Use the following procedure to check that the PC and LH-600F/FG are connected correctly.

1 Right-click (Windows start button) in the lower left of the PC screen.

» The right-click menu is displayed.

2 On the right-click menu, click [Device Manager].

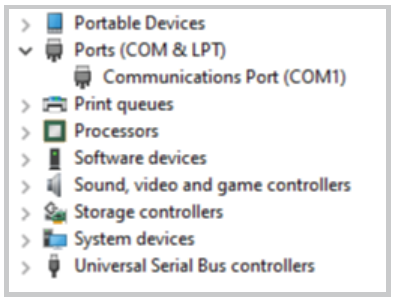
» [Device Manager] is displayed.

3 Click [Ports (COM & LPT)].

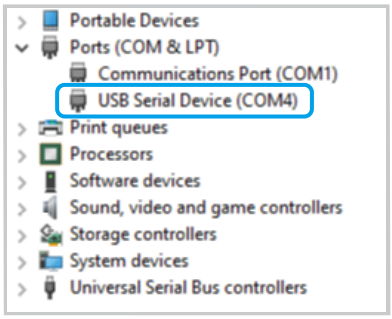
4 Disconnect and reconnect the USB cable, and check that a port disappears and reappears.

(In the following figure, LH-600F/FG is connected to port "COM4".)

When the USB cable is disconnected



When the USB cable is connected



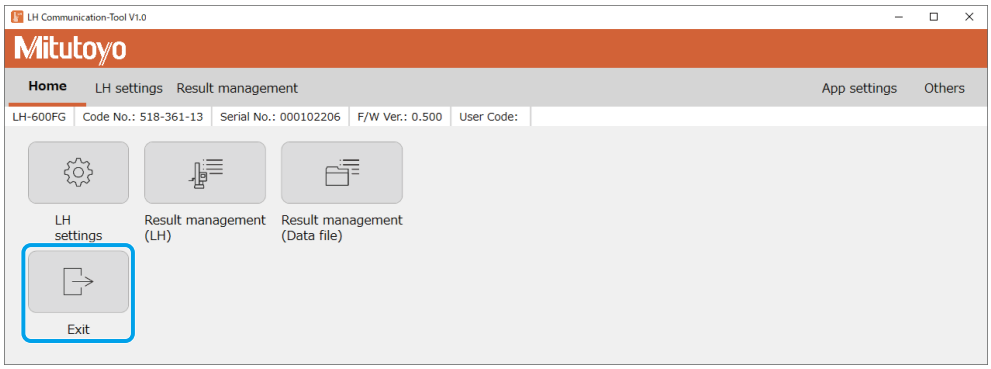
3.3 Exiting

This section explains how to exit the software.

1 **Click the [Home] menu item.**

» The [Home] screen is displayed.

2 **Click [Exit].**



» The software exits.

MEMO

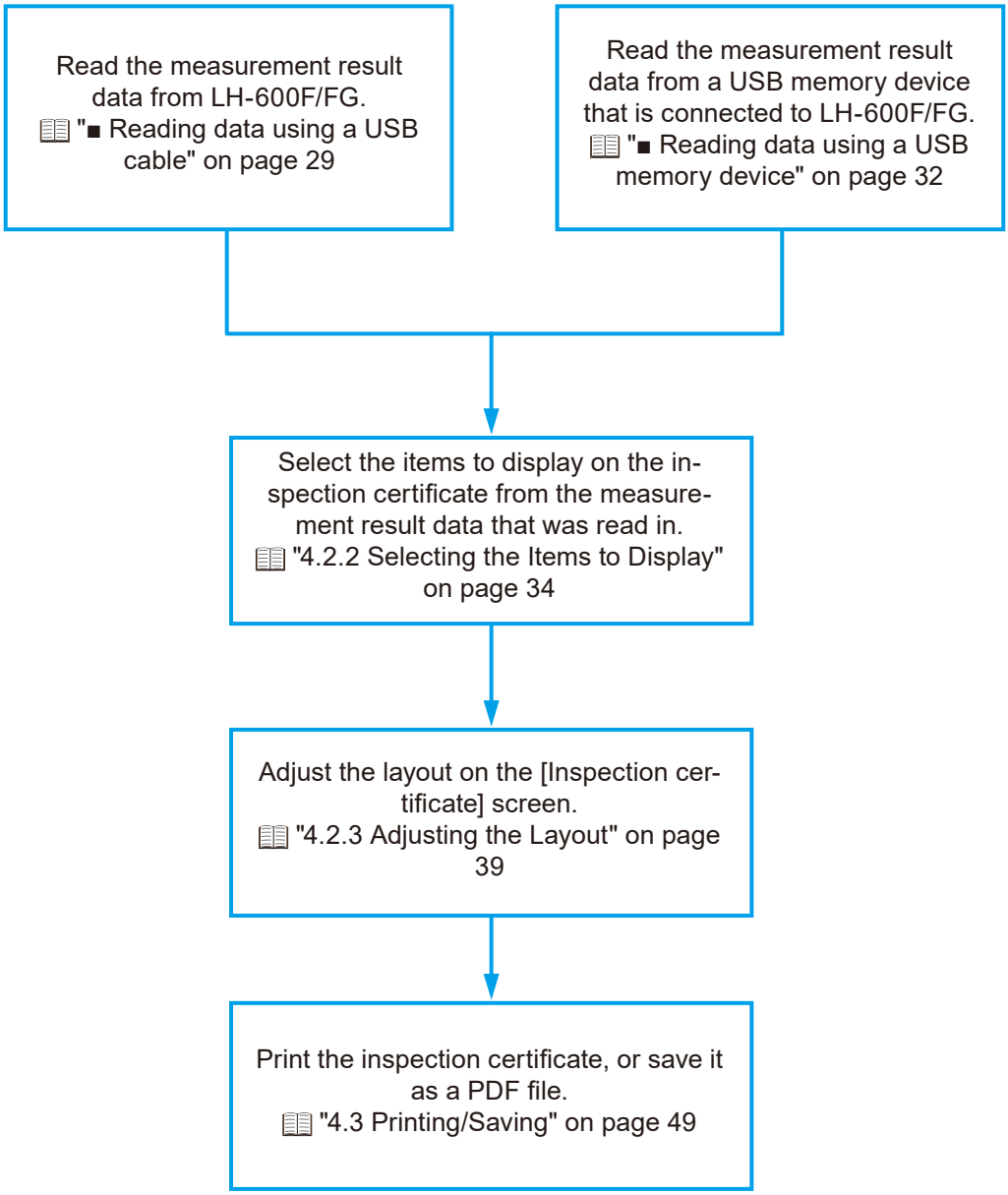
4 Inspection Certificates

This chapter explains how to create, save, and print inspection certificates using measurement result data from LH-600F/FG.

4.1 Flow for Creating and Printing/Saving 28
4.2 Creation 29
4.3 Printing/Saving 49

4.1 Flow for Creating and Printing/Saving

Inspection certificates are created and then printed or saved using the following flow.



4.2 Creation

Read the measurement result data from LH-600F/FG to create an inspection certificate.

4.2.1 Reading Measurement Result Data

Measurement result data can be read from LH-600F/FG with the following two methods.

- Directly read data from LH-600F/FG connected with a USB cable
- Indirectly read data from a USB memory device that had been connected to LH-600F/FG

■ Reading data using a USB cable

To read measurement result data from LH-600F/FG, connect the PC and LH-600F/FG with a USB cable (A type–B type).

IMPORTANT

While LH-600F/FG is connected with a USB cable to a PC on which this software is installed, operations cannot be performed with the LH-600F/FG display unit.

To operate LH-600F/FG from the display unit, follow the procedures in this document to exit the software, or disconnect the USB cable.

For details about how to exit this software, see "3.3 Exiting" on page 25.

1 Connect the PC and LH-600F/FG with a USB cable (A–B type), and then start the software.

See "3.2 Connection and Startup" on page 21.

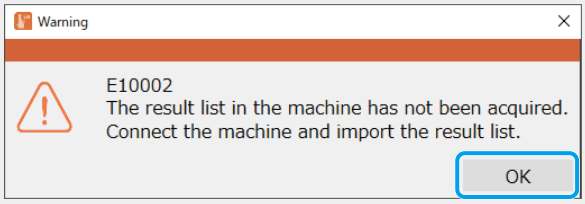
2 Click the [Result management] menu item.

» The [Result management] screen is displayed.

IMPORTANT

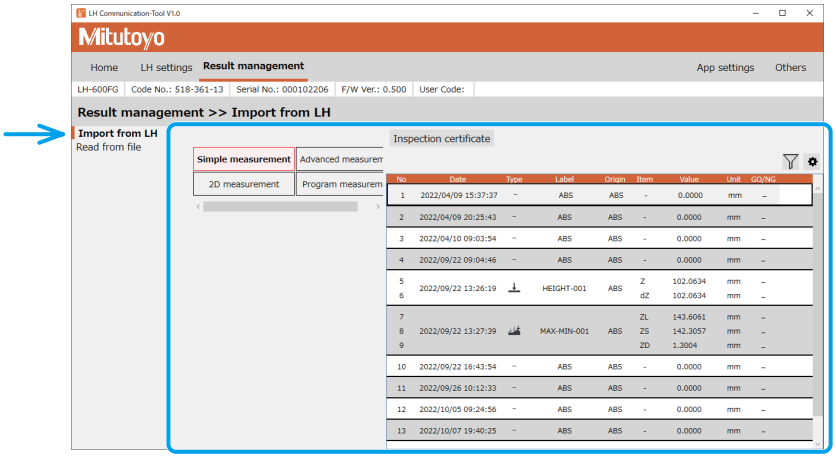
If you click the [Result management] menu item when you have never connected to LH-600F/FG and read the measurement result list, the following error message is displayed.

If the error message is displayed, click [OK], and repeat the procedure from step 1.



3 On the [Result management] screen, click [Import from LH].

» The [Import from LH] screen is displayed.

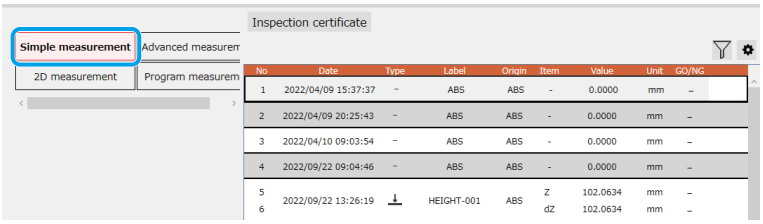


Tips

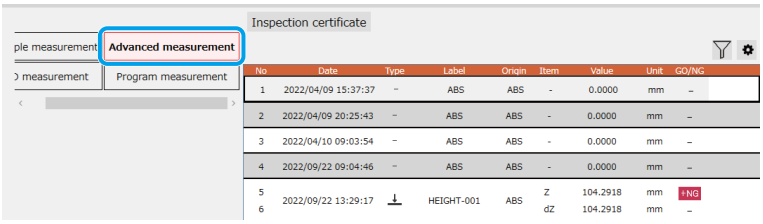
- The [Import from LH] screen on the [Result management] screen can also be displayed by clicking [Result management (LH)] on the [Home] screen.
- For details about the [Result management] screen, see "■ [Result management] screen" on page 13.

4 Select the measurement type.

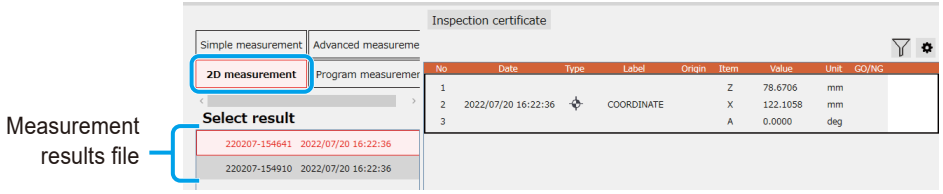
For simple measurement: Click [Simple measurement].



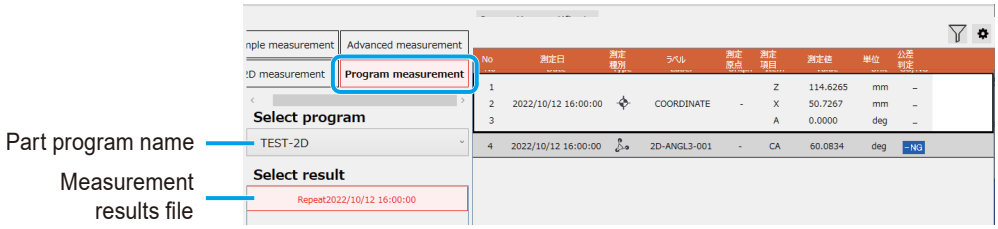
For advanced measurement: Click [Advanced measurement].



For 2D measurement: Click [2D measurement] and a measurement results file.



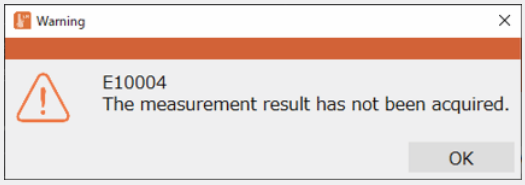
For part program measurement: Click [Program measurement], a part program name, and a measurement results file.



» The measurement result data for each measurement is read in.

Tips

- If the software switches to offline mode after you have connected once, the most recently read measurement result data is displayed.
- If virtual elements are registered in a part program for 2D measurement, measurement results may not be obtained. In this case, the following error message appears.



■ Reading data using a USB memory device

LH-600F/FG measurement result data that is saved on the PC can be read into this software.

After measurement result data has been output to a USB memory device connected to LH-600F/FG, you can connect the USB memory device to the PC and save the measurement result data as a file on the PC.

Tips

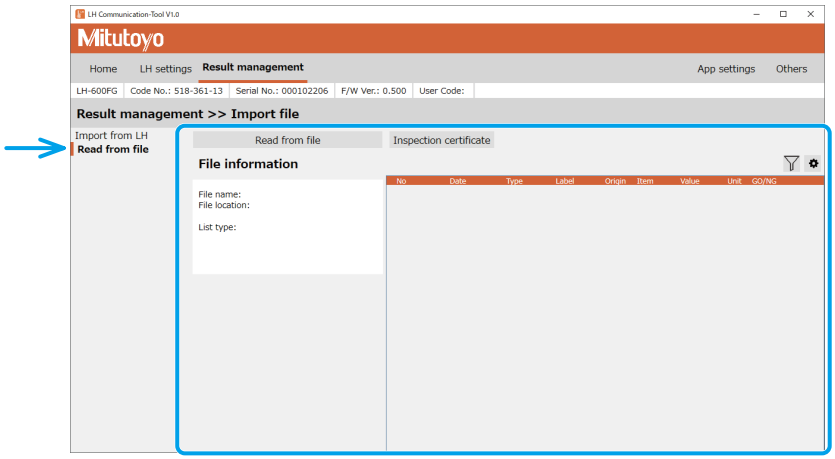
For details about saving measurement result data to a USB memory device connected to LH-600F/FG, see "6.2.2 Data Output" in "PART B Measurement" in the separate LH-600F/FG User's Manual.

1 Click the [Result management] menu item in this software.

» The [Result management] screen is displayed.

2 On the [Result management] screen, click [Read from file].

» The [Read from file] screen is displayed.



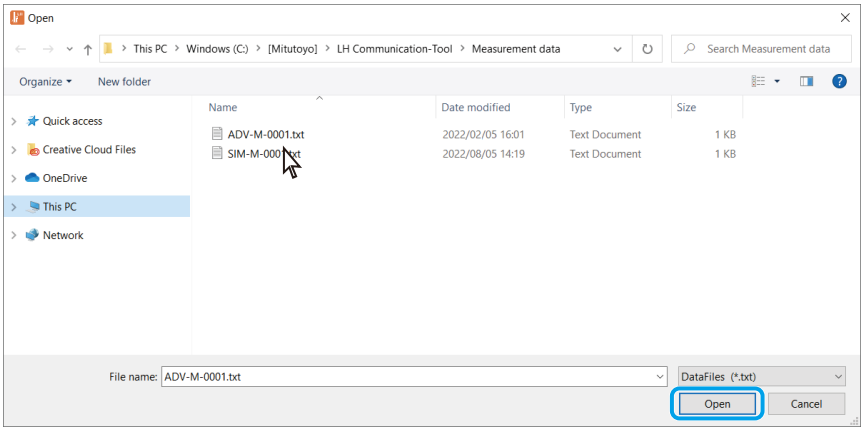
Tips

- The [Read from file] screen on the [Result management] screen can also be displayed by clicking [Result management (Data file)] on the [Home] screen.
- For details about the [Result management] screen, see "■ [Result management] screen" on page 13.

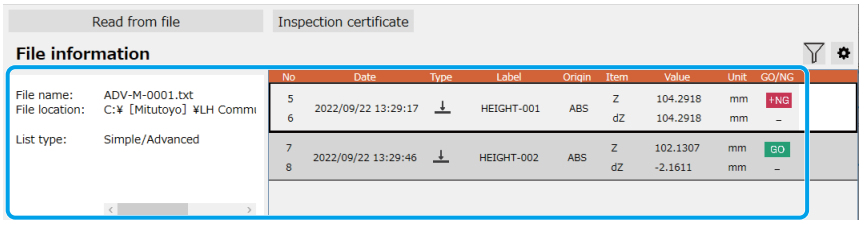
3 Click [Read from file].

» The [Open] window is displayed.

4 Select a measurement results file (a plain-text file), and click [Open].



» The measurement results file is displayed on the [Result management] screen.



4.2.2 Selecting the Items to Display

Select the items to display on the inspection certificate from the measurement result data that was read in from LH-600F/FG or from a file saved on the PC.

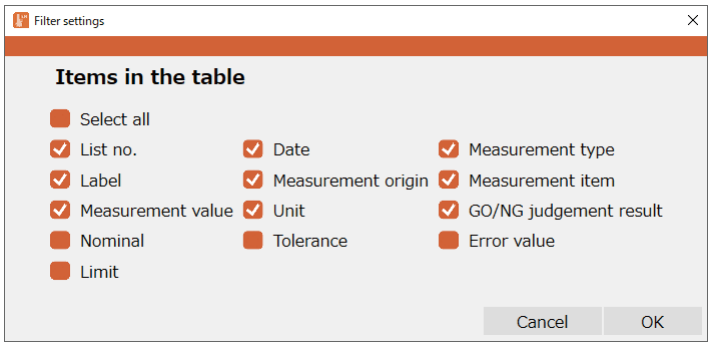
The following explanation uses the measurement result data from advanced measurement as an example.

1 Select the items to display on the inspection certificate.

1 Click .

» The [Filter settings] screen is displayed.

2 Select the check boxes of the items to display on the inspection certificate (and deselect items to not display).



Tips

Selecting [Select all] selects the check boxes of all items.

3 Click [OK].

Tips

Clicking [Cancel] closes the [Filter settings] screen.

» The selected items to display are displayed on the [Result management] screen.

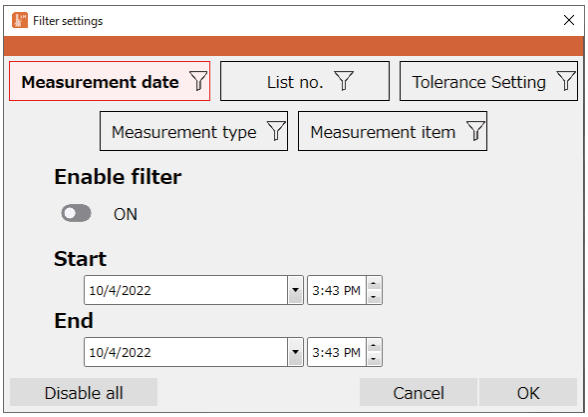
2 Filter the details of the display items.

1 Click .

» The [Filter settings] screen is displayed.

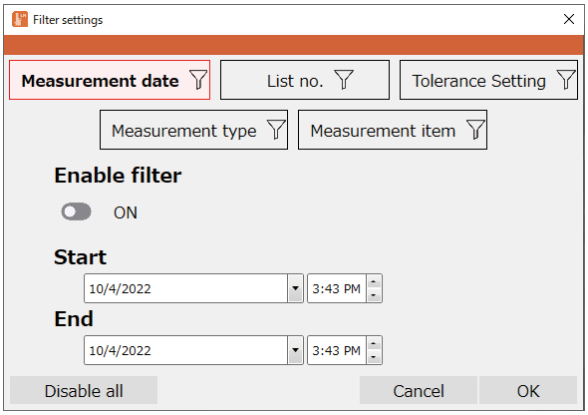
2 Click each of the items, and select the contents to display on the inspection certificate.

Content common to all items



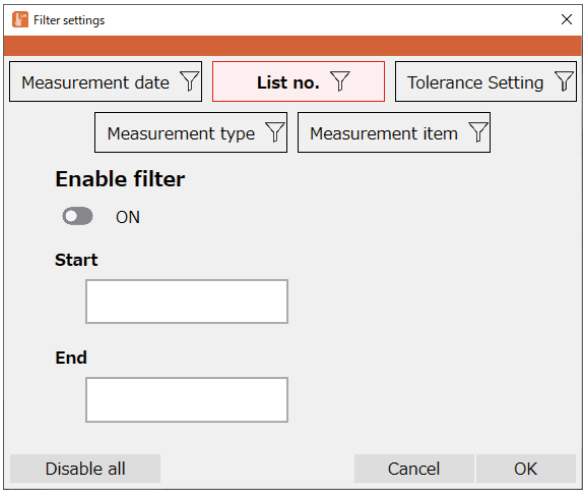
Item	Description
[Enable filter]	If this item is turned ON (enabled), the measurement result data will be filtered according to the displayed contents. When the filter is enabled for an item ([Measurement date], [List no.], [Tolerance Setting] (GO/NG judgment result), [Measurement type], [Measurement item]), the filter mark for that item is displayed in orange, as shown in the following figure.
[Disable all]	All filters that were enabled on the [Filter settings] screen are disabled.
[Cancel]	Close the [Filter settings] screen.
[OK]	Apply the contents set on the [Filter settings] screen to the measurement result data.

Filter settings screen for [Measurement date]



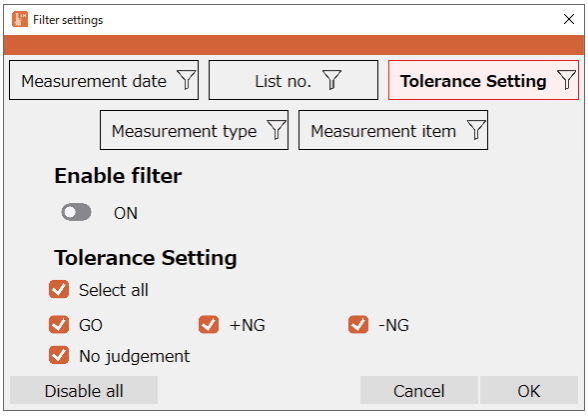
Item	Description
[Start]	Select the starting date and time from the drop-down list.
[End]	Select the ending date and time from the drop-down list.

Filter settings screen for [List no.]



Item	Description
[Start]	Enter the starting number for the measurement result list.
[End]	Enter the ending number for the measurement result list.

Filter settings screen for [Tolerance Settings] (GO/NG judgment result)

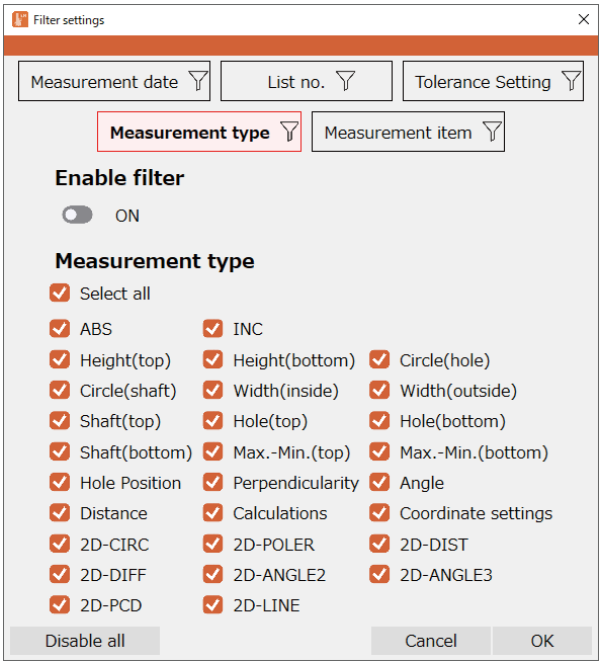


Item	Description
[Select all]	Select [GO], [+NG], [-NG], and [No judgement] all together.
[GO]	Select items with GO (pass).
[+NG]	Select items with +NG (failed by exceeding the upper tolerance).
[-NG]	Select items with -NG (failed by falling below the lower tolerance).
[No judgement]	Select items with no GO/NG judgment result.

Filter settings screen for [Measurement type]

Select the measurement origin (ABS origin or INC origin) and a measurement type such as height, width, and hole.

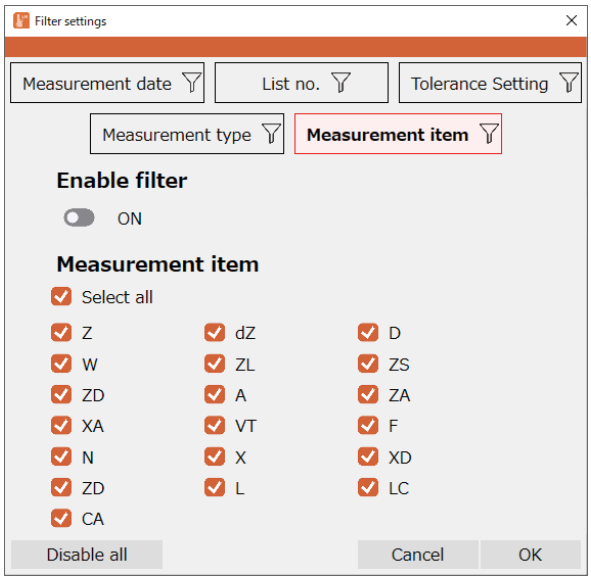
For details about measurement origins and measurement types, see the separate LH-600F/FG User's Manual.



Filter settings screen for [Measurement item]

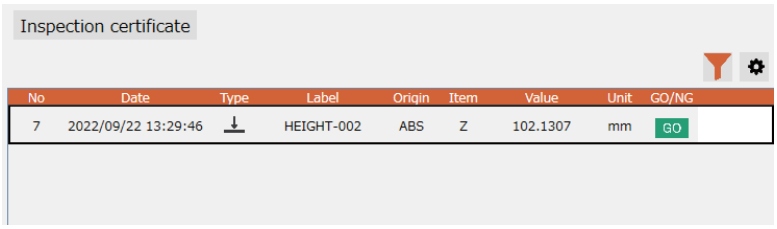
Select measurement items such as Z, D, and W.

For details about measurement items, see 📖 the separate LH-600F/FG User's Manual.



3 When you have completed the filtering, click [OK].

» The contents specified by filtering are applied to the measurement result data.



Tips

The filter mark to the upper-right of the measurement result data indicates the filter status (enabled or disabled) as follows.

Filter enabled (the filter is set):

Filter disabled (the filter is not set):

4.2.3 Adjusting the Layout

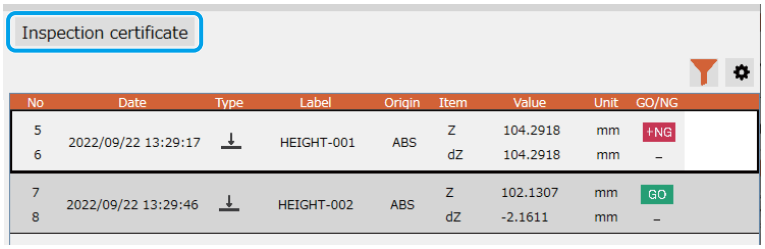
Apply the items to display and the filtered details of the measurement result data to the inspection certificate, and adjust the layout.

The layout items that can be adjusted are as follows.

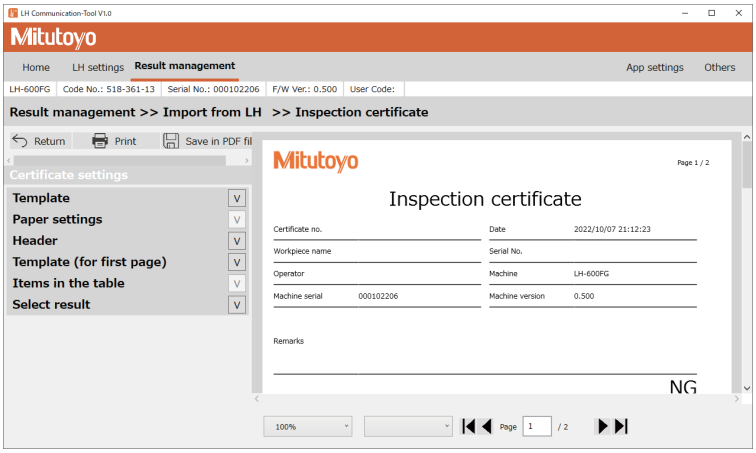
Layout item	Description	Reference
[Template]	Select the formatting to use (template or custom settings).	"■ Template" on page 41
[Paper settings] *1	Set the page size, margins, indents, table width, etc.	"■ Paper settings" on page 43
[Header]	Set the contents to display in the header. You can also import your company's logo into the PC and display it in the header.	"■ Header/Footer" on page 45
[Template (for first page)]	Set the contents to include on the first page of the inspection certificate, such as the date of creation, operator, and workpiece name.	"■ Template (for first page)" on page 46
[Items in the table] *1	This item is used to change the display items that were filtered on the [Result management] screen.	"■ Items in the table" on page 47
[Select result]	You can select the measurement results to include on the inspection certificate from among the measurement result data that was filtered on the [Result management] screen.	"■ Select result" on page 48

*1 [Paper settings] and [Items in the table] can be edited only when [Custom settings] is selected from among the template items.

1 Click [Inspection certificate].



» The [Certificate settings] screen is displayed.



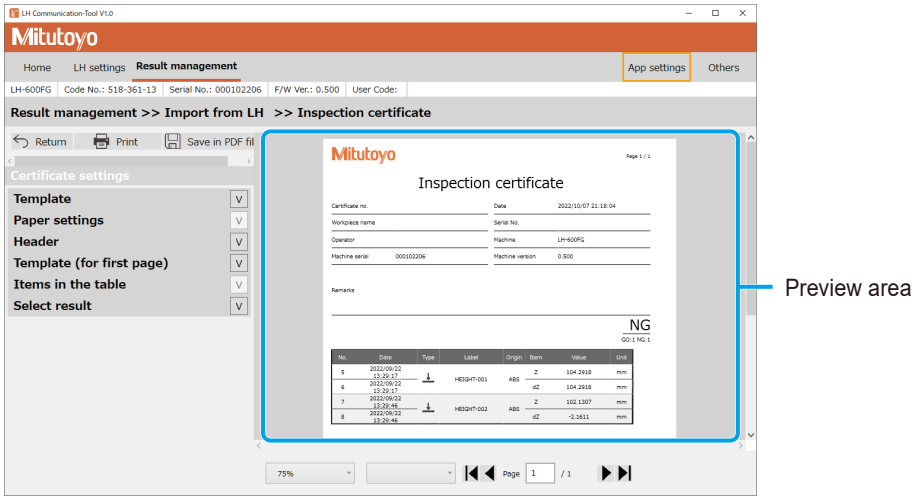
2 Adjust the layout of the inspection certificate.

Tips

For details about each of the layout items, see the following.

"■ Template" on page 41
"■ Paper settings" on page 43
"■ Header/Footer" on page 45
"■ Template (for first page)" on page 46
"■ Items in the table" on page 47
"■ Select result" on page 48

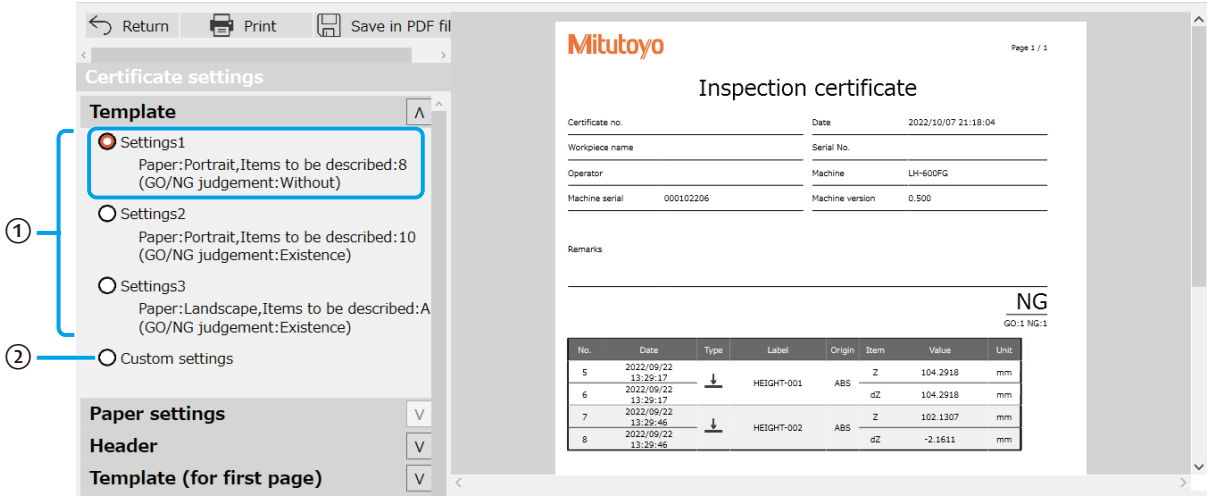
3 Check the results in the preview area.



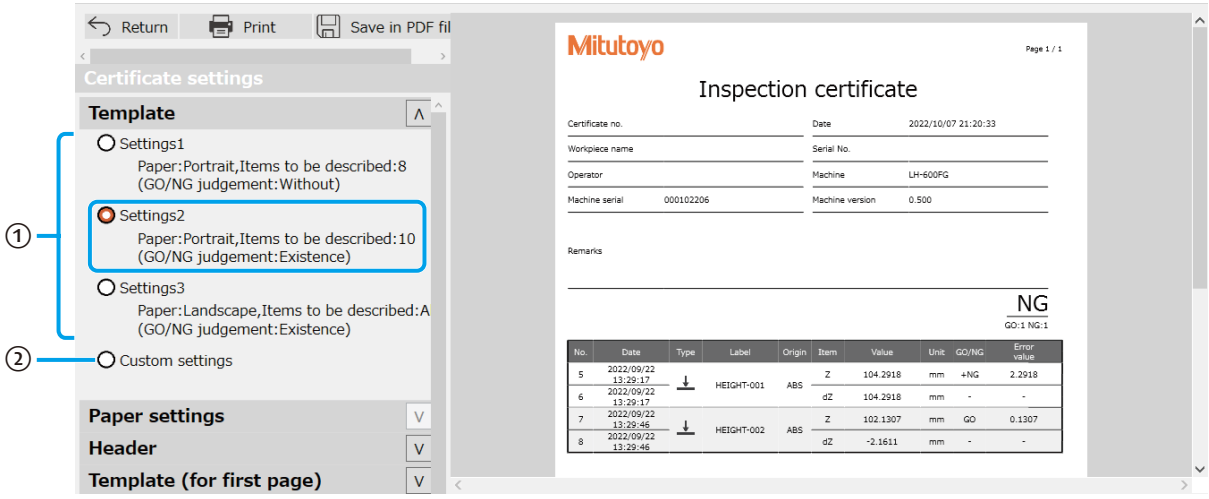
■ Template

Select the formatting for the inspection certificate.

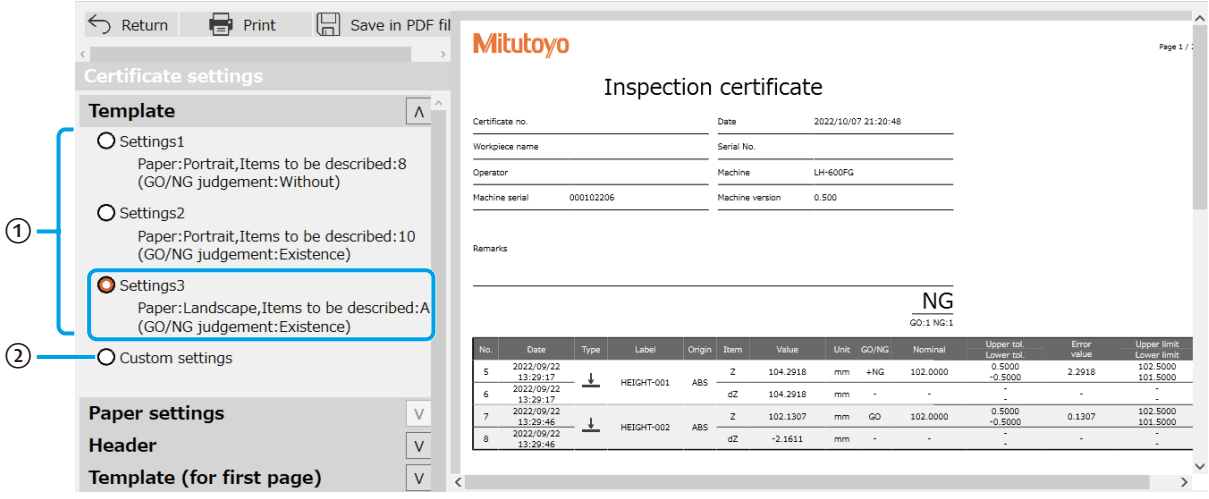
Settings 1



Settings 2



Settings 3



<table>
<tr><th>No.</th><th>Item</th><th>Description</th></tr>
<tr><td>①</td><td>[Settings 1] to [Settings 3]</td><td>Use a template. The contents of each template are as follows.
<table>
<tr><th>Template</th><th>Print direction</th><th>Items to be described</th><th>GO/NG judgement</th></tr>
<tr><td>[Settings 1]</td><td>Portrait</td><td>8</td><td>Without</td></tr>
<tr><td>[Settings 2]</td><td>Portrait</td><td>10</td><td>Existence</td></tr>
<tr><td>[Settings 3]</td><td>Landscape</td><td>All</td><td>Existence</td></tr>
</table>
Tips
If you have selected one of Settings 1 to Settings 3, [Paper settings] and [Items in the table] are set automatically.</td></tr>
<tr><td>②</td><td>[Custom settings]</td><td>Use the settings in paper settings.
For details about paper settings, see "■ Paper settings" on page 43.</td></tr>
</table>

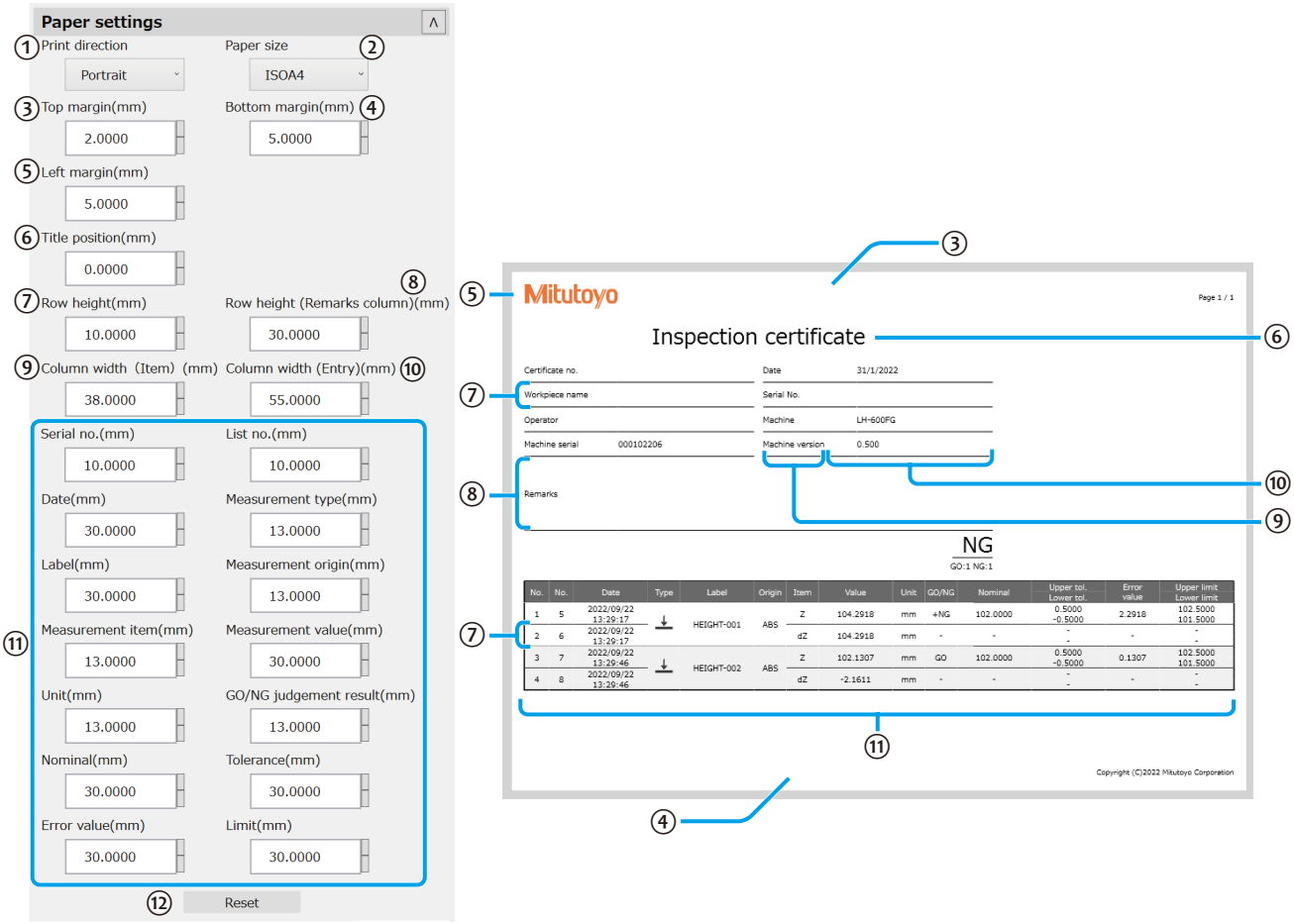
■ Paper settings

Set the page layout of the inspection certificate.

Tips

Paper settings can be configured only when [Custom settings] is selected in [Template].

For details, see "■ Template" on page 41.



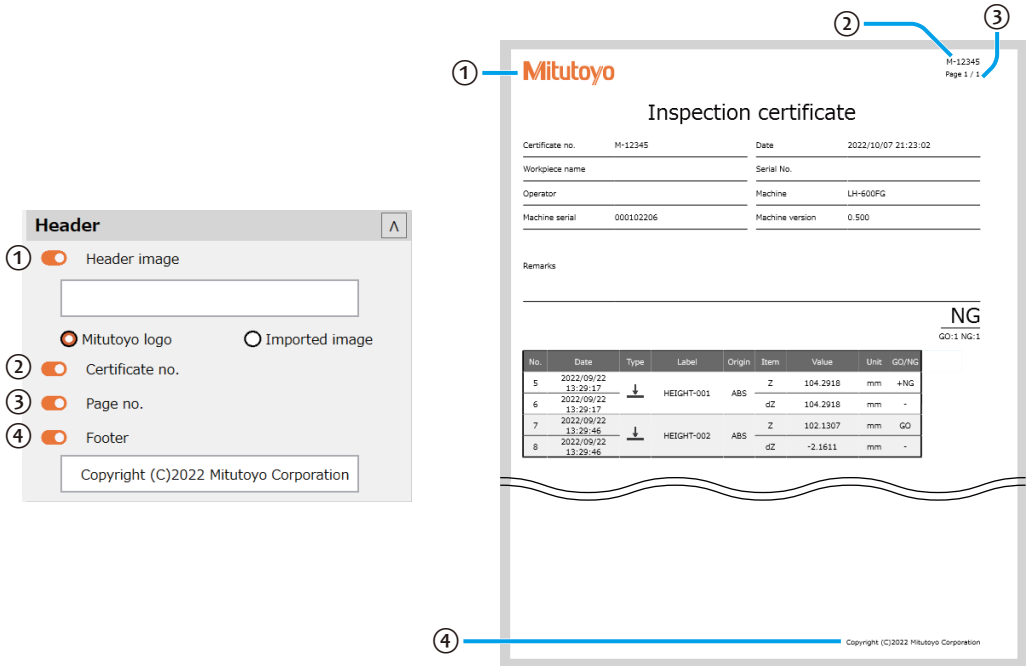
No.	Item	Description	Selection method
①	[Print direction]	Set the print direction ([Portrait]/[Landscape]).	Drop-down list
②	[Paper size]	Set the page size ([Unknown], [ISOA3], [ISOA4], [NorthAmerica11x17], [NorthAmerica9x11]).	Drop-down list
③	[Top margin]	Set the margin from the top of the page to the header.	Place the cursor in the input field and directly enter a value, or use the increment/decrement buttons to the right of the input field to enter a value.
④	[Bottom margin]	Set the margin from the bottom of the page to the footer.	
⑤	[Left margin]	Set the margin from the left of the page to the item columns and table.	
⑥	[Title position]	Set the left indent of the title ("Inspection certificate" in the figure above).	

No.	Item	Description	Selection method
⑦	[Row height]	Set the height of rows other than the row for the [Remarks] column.	Place the cursor in the input field and directly enter a value, or use the increment/decrement buttons to the right of the input field to enter a value.
⑧	[Row height (Remarks column)]	Set the row height of the [Remarks] column.	
⑨	[Column width (Item)]	Set the width of the item columns.	
⑩	[Column width (Entry)]	Set the width of the entry columns.	
⑪	Width (measurement result list)	Set the width for each item column in the measurement result list.	
⑫	[Reset]	Return the settings to their initial values.	–

■ Header/Footer

Set whether to display or hide each item in the header and footer.

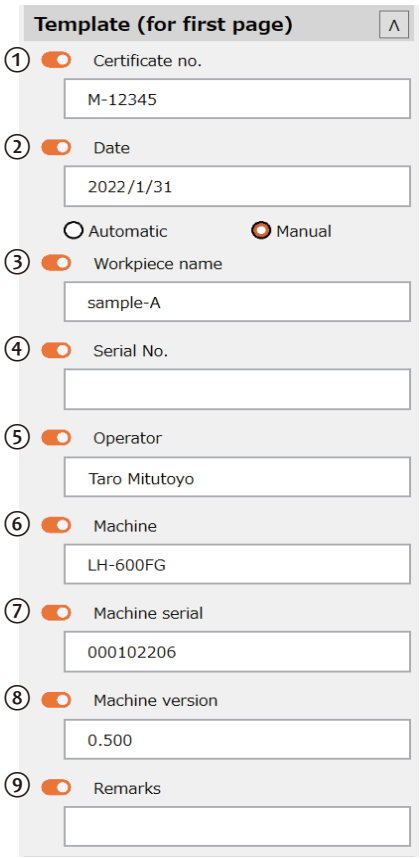
Clicking the button to the left of each item toggles between displaying ( ) and hiding ( ) the item.

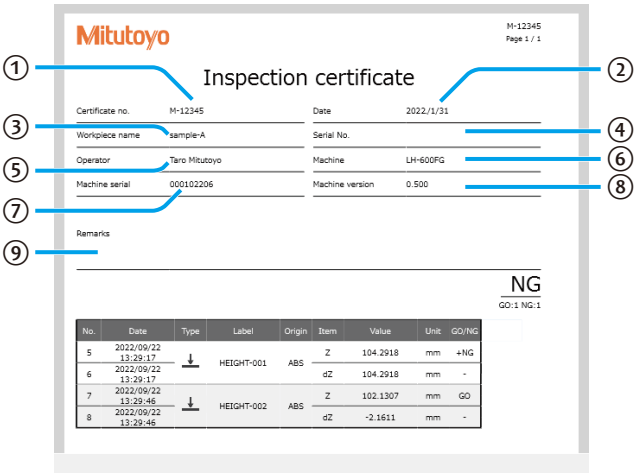


No.	Item	Description
①	[Header image]	Set whether to display or hide the "Mitutoyo" logo or a custom imported image*. If you choose to display an image ( ), click a radio button to select which image to display. * To import a custom image: Double-click the input field below [Header image] to display the [Open] window. Select an image file (.png / .jpg / .bmp), and click [Open] to import the image into this software. **Tips** The size of the image that can be imported differs depending on the resolution of your PC display. When importing an image, use the preview as a guide to adjust the image size until you achieve satisfactory results.
②	[Certificate no.]	Set whether to display or hide the number that you input in "■ Template (for first page)" on page 46.
③	[Page no.]	Set whether to display or hide the page number.
④	[Footer]	If you choose to display the footer ( ), you can input the desired footer content. Click the input field, and enter the desired text. Initially, the Mitutoyo copyright statement is entered.

■ Template (for first page)

Set the text for each item to include on the first page and whether to display or hide it.
Clicking the button to the left of each item toggles between displaying ( ) and hiding ( ) the item.





No.	Item	Description
①	[Certificate no.]	Input the desired numbers and/or characters.
②	[Date]	To automatically obtain the date from the PC, select the [Automatic] radio button. To input a custom date, select the [Manual] radio button, and then input the date in the input field.
③	[Workpiece name]	Input a name for the workpiece that was measured.
④	[Serial No.]	Input the serial number of the workpiece.
⑤	[Operator]	Input the name of the operator.
⑥	[Machine]*1	Input the model name of the measuring instrument (LH-600F or LH-600FG).
⑦	[Machine serial]*1	Input the serial number of the measuring instrument.
⑧	[Machine version]*1	Input the software version of the measuring instrument.
⑨	[Remarks]	If there is any additional information beyond that above, enter it in the [Remarks] field.

*1 If the instrument is connected in online mode, the instrument information ([Machine], [Machine serial], and [Machine version]) is input automatically.

■ Items in the table

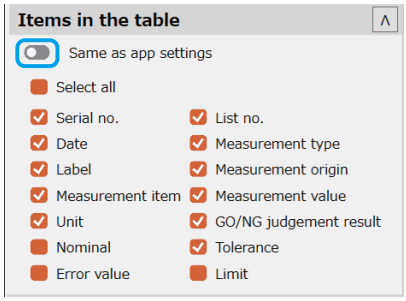
This item is used to change from the [Inspection certificate] screen which items to display from the measurement result list.

By default, the items to display that were set on the [Result management] screen are displayed on the inspection certificate.

Use the following procedure to change them.

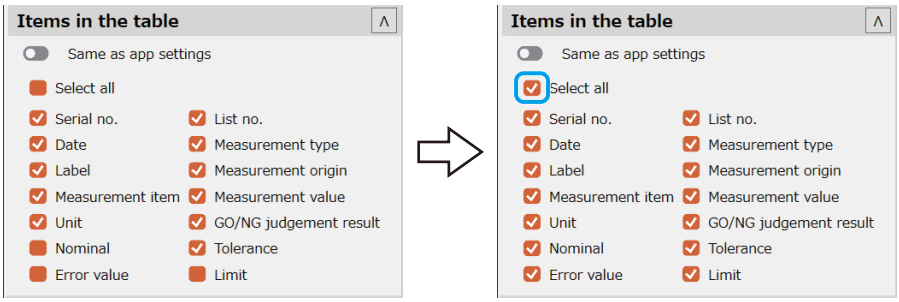
1 Click [Same as app settings] to disable it ( ).

» The items to display are displayed.



2 Select the items that you want to display on the inspection certificate.

Here as an example, the [Select all] check box is selected so that all items are selected.

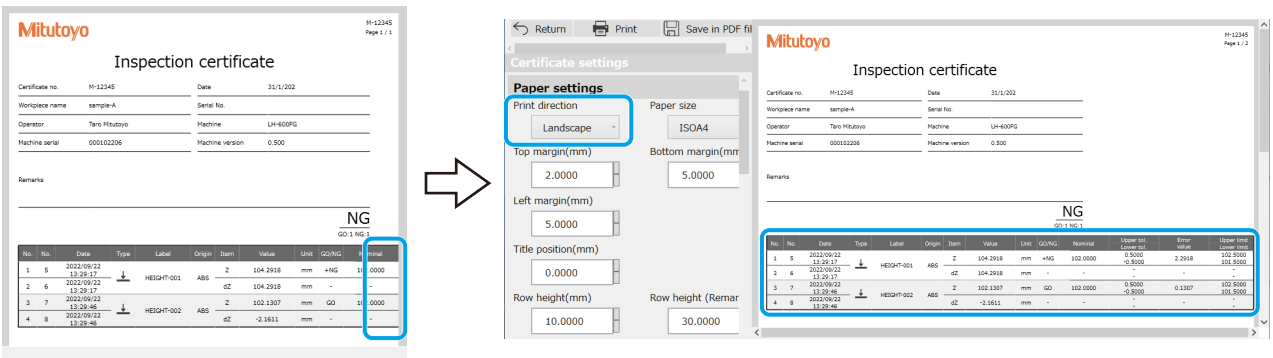


Tips

If you select the [Select all] check box to select all the items, and [Print direction] is set to [Portrait] and [Paper size] is set to [ISOA4] in the [Paper settings] items, some of the display items may not fit on the inspection certificate.

In this case, set [Print direction] to [Landscape], and adjust the item column widths.

For details, see "■ Paper settings" on page 43.



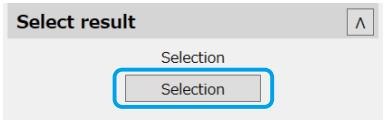
■ Select result

This item is used to change the measurement result list from the [Inspection certificate] screen.

By default, the measurement result list that was set on the [Result management] screen is displayed on the inspection certificate.

Use the following procedure to change them.

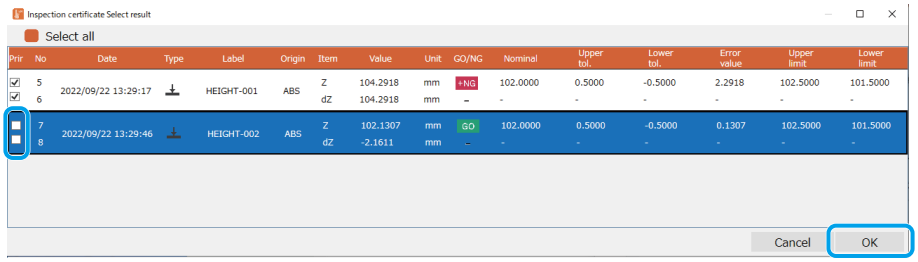
1 Click [Selection].



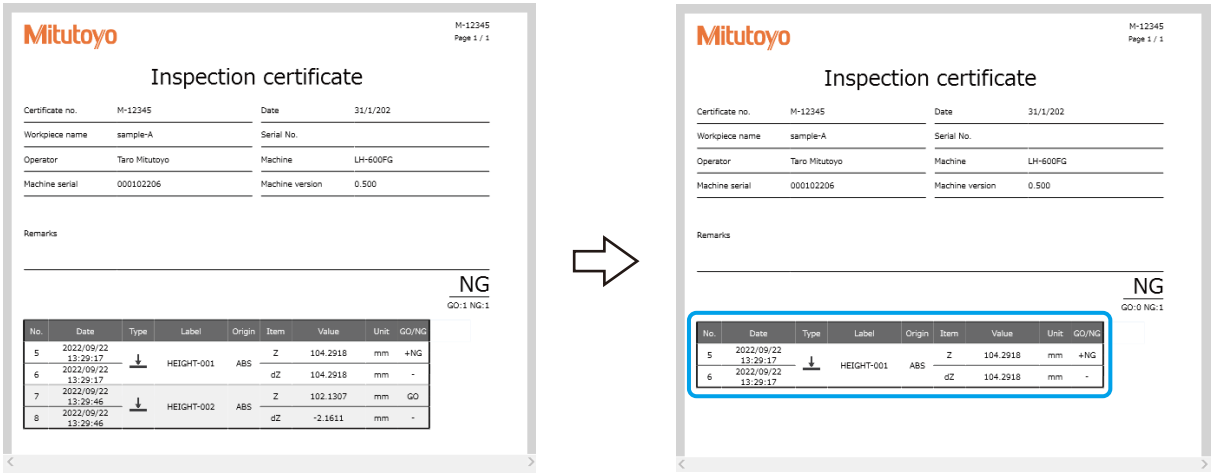
» The screen for selecting the measurement results is displayed.

2 Select the measurement results that you want to display on the inspection certificate, and click [OK].

Here as an example, the [HEIGHT-002] check boxes are cleared, and only [HEIGHT-001] is selected.



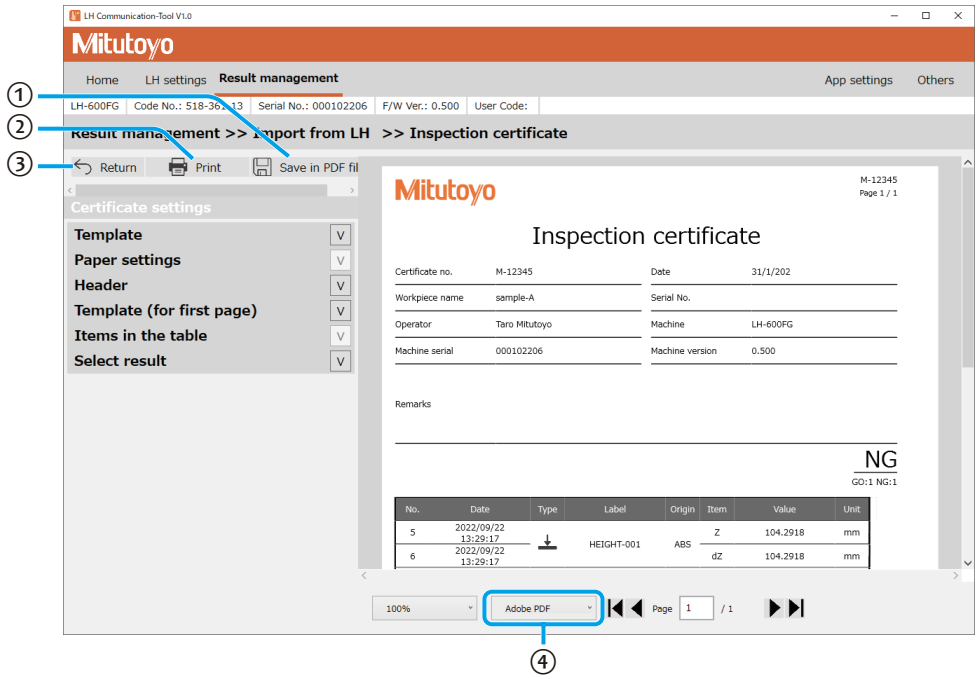
» The changes are reflected in the inspection certificate preview area.



4.3 Printing/Saving

Print the completed inspection certificate, or save it as a PDF file.

This explanation uses the inspection certificate whose layout was adjusted in "4.2 Creation" on page 29 as an example.



No.	Item	Description
①	[Save in PDF file]	Convert the inspection certificate to a PDF file, and save it on the PC.
②	[Print]	Print the inspection certificate with a printer that is connected to the PC or with a virtual printer on the PC. Select the print media with the print media selection button in ④, and click [Print].
③	[Return]	Return to the [Result management] screen.
④	Print media selection button	Select the print media. After you select the print media and click [Print] ②, the inspection certificate will be printed on the selected media. **Tips** Printer, OneNote, Microsoft XPS Document Writer, Adobe PDF, etc., can be selected as the print media.

■ Printing

1 Select the print media.

2 Click [Print].

» The inspection certificate is printed from the selected print media.

■ Saving as a PDF file

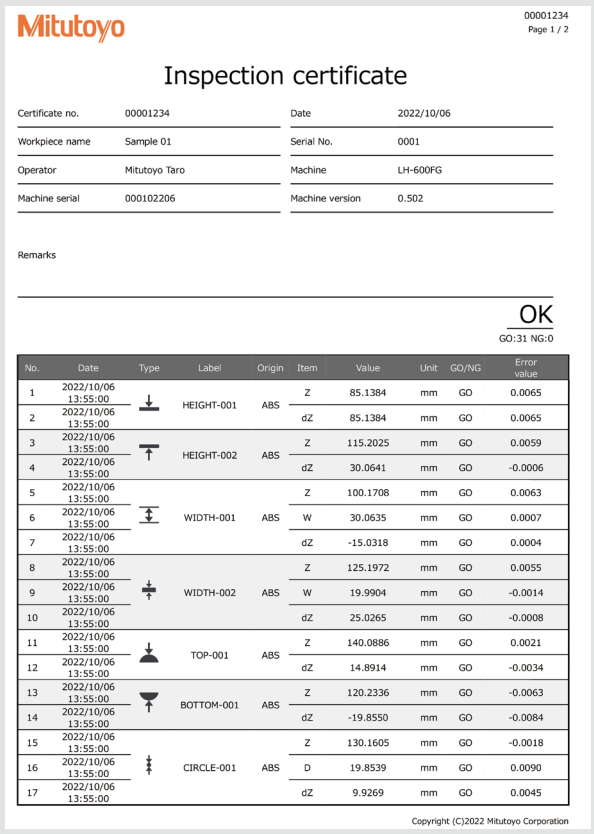
1 Click [Save in PDF file].

» The [Save] window is displayed.

2 Input a file name, and save the inspection certificate in the desired location.

» The inspection certificate is converted to a PDF file and saved.

■ Layout examples



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00001234
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Inspection certificate

Certificate no.	00001234	Date	2022/10/06
Workpiece name	Sample 01	Serial No.	0001
Operator	Mitutoyo Taro	Machine	LH-600FG
Machine serial	000102206	Machine version	0.502

Remarks

OK
GO:31 NG:0

No.	Date	Type	Label	Origin	Item	Value	Unit	GO/NG	Error value
1	2022/10/06 13:55:00		HEIGHT-001	ABS	Z	85.1384	mm	GO	0.0065
2	2022/10/06 13:55:00				dZ	85.1384	mm	GO	0.0065
3	2022/10/06 13:55:00		HEIGHT-002	ABS	Z	115.2025	mm	GO	0.0059
4	2022/10/06 13:55:00				dZ	30.0641	mm	GO	-0.0006
5	2022/10/06 13:55:00		WIDTH-001	ABS	Z	100.1708	mm	GO	0.0063
6	2022/10/06 13:55:00				W	30.0635	mm	GO	0.0007
7	2022/10/06 13:55:00				dZ	-15.0318	mm	GO	0.0004
8	2022/10/06 13:55:00		WIDTH-002	ABS	Z	125.1972	mm	GO	0.0055
9	2022/10/06 13:55:00				W	19.9904	mm	GO	-0.0014
10	2022/10/06 13:55:00				dZ	25.0265	mm	GO	-0.0008
11	2022/10/06 13:55:00		TOP-001	ABS	Z	140.0886	mm	GO	0.0021
12	2022/10/06 13:55:00				dZ	14.8914	mm	GO	-0.0034
13	2022/10/06 13:55:00		BOTTOM-001	ABS	Z	120.2336	mm	GO	-0.0063
14	2022/10/06 13:55:00				dZ	-19.8550	mm	GO	-0.0084
15	2022/10/06 13:55:00		CIRCLE-001	ABS	Z	130.1605	mm	GO	-0.0018
16	2022/10/06 13:55:00				D	19.8539	mm	GO	0.0090
17	2022/10/06 13:55:00				dZ	9.9269	mm	GO	0.0045

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Inspection certificate

Certificate no.	00001234	Date	2022/10/06
Workpiece name	Sample 01	Serial No.	0001
Operator	Mitutoyo Taro	Machine	LH-600FG
Machine serial	000102206	Machine version	0.502

Remarks

NG
GO:1 NG:2

No.	Date	Type	Label	Origin	Item	Value	Unit	GO/NG	Error value
1	2022/10/06 14:02:00				VT	0.4200	mm	+NG	-
2	2022/10/06 14:02:00		PERPEND-001	-	A	89.6444	deg	GO	-0.5045
3	2022/10/06 14:02:00				F	0.3571	mm	+NG	-

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5 Parameters: Editing, Applying, and Saving

You can edit settings, save them to the PC, and apply them to LH-600F/FG. This chapter explains these procedures.

5.1 System Settings..... 52
5.2 Tolerance Settings 58

5.1 System Settings

You can read the system settings data and edit the settings. You can also apply the edited settings to LH-600F/FG or save them to the PC.

System settings data can be read from LH-600F/FG with the following two methods.

- Directly read data from LH-600F/FG connected with a USB cable
- Read a file that was edited with this software and saved on the PC

■ Reading data from LH-600F/FG and editing it

To read system settings data from LH-600F/FG, connect the PC and LH-600F/FG with a USB cable (A type–B type).

IMPORTANT

While LH-600F/FG is connected with a USB cable to a PC on which this software is installed, operations cannot be performed with the LH-600F/FG display unit.

To operate LH-600F/FG from the display unit, follow the procedures in this document to exit the software, or disconnect the USB cable.

For details about how to exit this software, see "3.3 Exiting" on page 25.

1 Connect the PC and LH-600F/FG with a USB cable (A–B type), and then start the software.

See "3.2 Connection and Startup" on page 21.

2 Click the [LH settings] menu item.

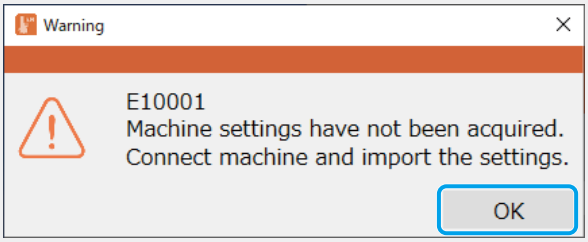
» The [LH settings] screen is displayed.

» The system settings data and tolerance settings data is read automatically and displayed on the [LH settings] screen.

IMPORTANT

If you click the [LH settings] menu item when you have never connected to LH-600F/FG and read the system settings data, the following error message is displayed.

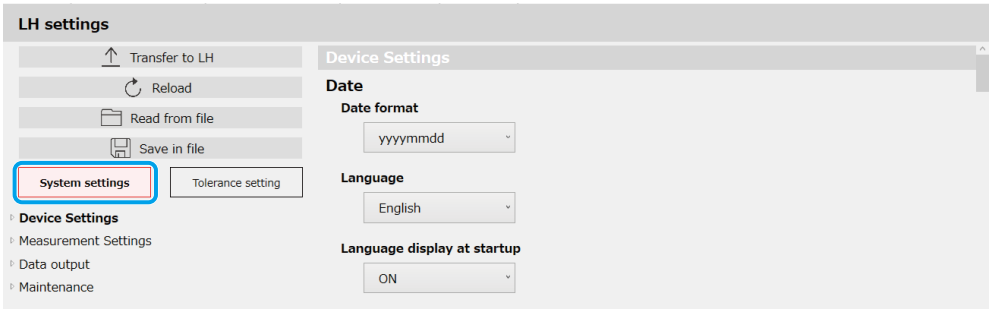
If the error message is displayed, click [OK], and repeat the procedure from step 1.



Tips

- You can also display the [LH settings] screen by clicking [LH settings] on the [Home] screen.
- For details about the [LH settings] screen, see "■ [LH settings] screen" on page 12.

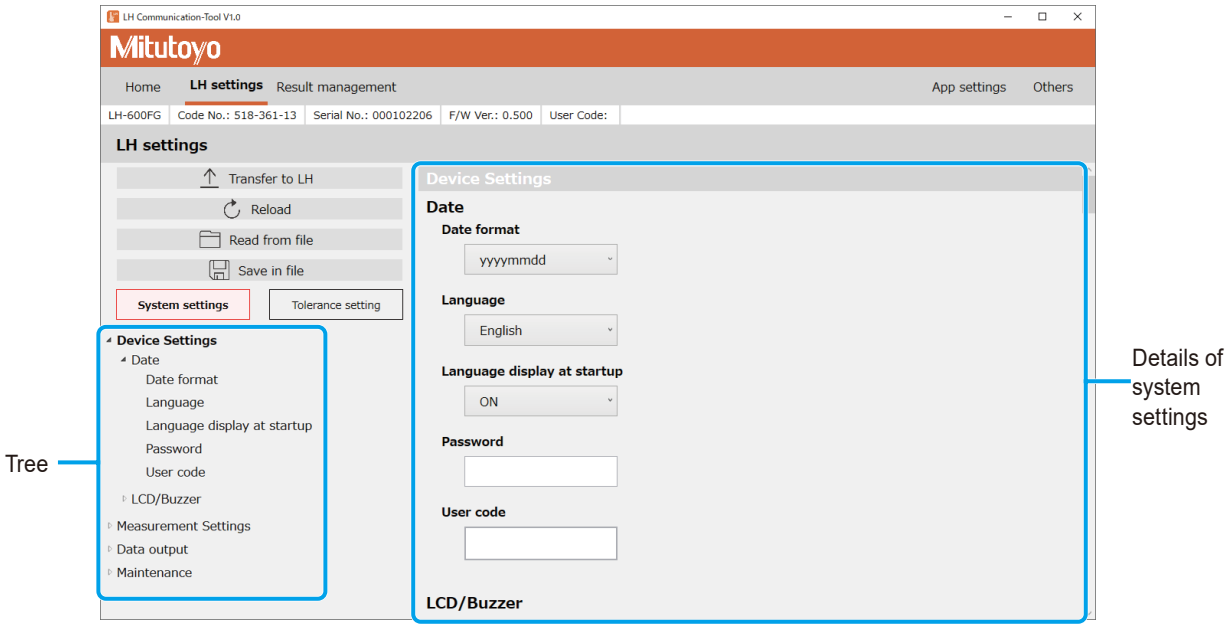
3 Click [System settings].



» The details of the system settings data are displayed on the right side of the screen.

Tips

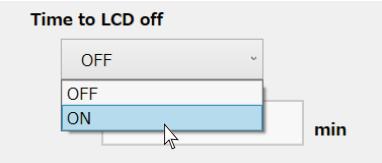
- If the software switches to offline mode after you have connected once, the most recently read system settings data is displayed.
- When you click [System settings], the button turns orange (selected state).
- System settings are the settings in [Device Settings], [Measurement Settings], [Data output], and [Maintenance]. You can also select settings from the tree that is displayed on the left side of the screen.



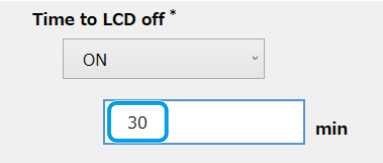
4 Change the settings.

The settings can be changed with the following methods.

Select a value from a drop-down list.

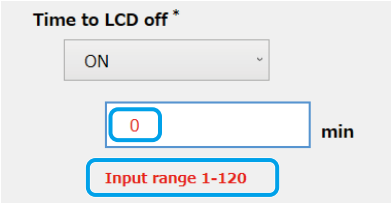


Input numbers or text in an input field.



Tips

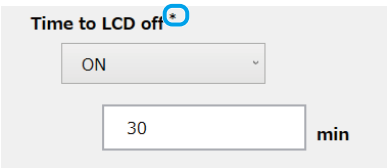
- For details about the settings, see "1.4.2 [Device Settings] Screen" in "PART C System Settings" in the separate LH-600F/FG User's Manual.
- If you input a number or text that cannot be set, the number or text is displayed in red and an error message is displayed, as shown in the following figure. Input the number or text again within the displayed range.



» The settings are changed.

Tips

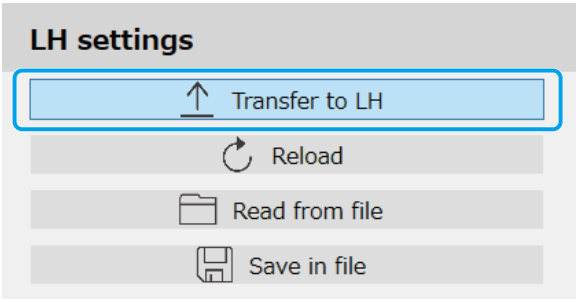
An asterisk (*) is displayed on settings that have been changed, as shown in the following figure.



5 Write the changed settings to LH-600F/FG or save them on the PC.

To write data to LH-600F/FG

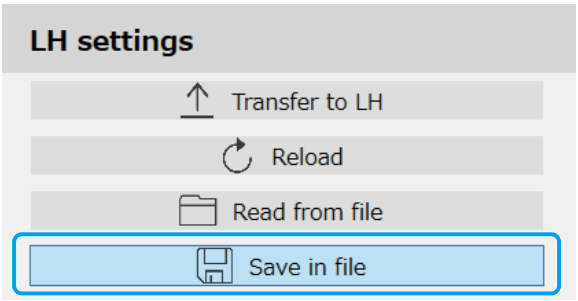
1 Click [Transfer to LH].



» The changed settings are written to the main unit.

To save data on the PC

1 Click [Save in file].



» The [Save] window is displayed.

2 Input a file name, and save the system settings data in the desired location.

» The system settings data is saved. (File extension: .lhc)

Tips

The "LH settings data" that is saved on the PC includes both "System settings data" and "Tolerance setting data".

■ Reading data from a file and editing it

The LH-600F/FG system settings data can be saved on the PC with this software.
Use the following procedure to read saved system settings data into this software.

Tips

For details about how to save system settings data on a PC, see "■ Reading data from LH-600F/FG and editing it" on page 52 in "5.1 System Settings".

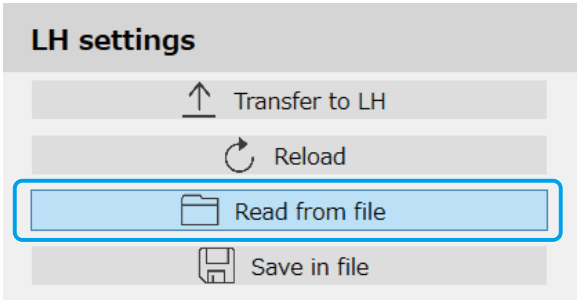
1 Click the [LH settings] menu item in this software.

» The [LH settings] screen is displayed.

Tips

- You can also display the [LH settings] screen by clicking [LH settings] on the [Home] screen.
- For details about the [LH settings] screen, see "■ [LH settings] screen" on page 12.

2 On the [LH settings] screen, click [Read from file].

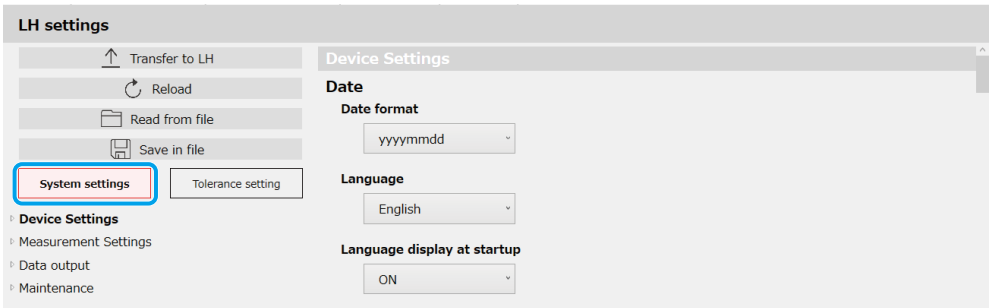


» The [Open] window is displayed.

3 Select the desired system settings data, and click [Open].

» The system settings data is displayed on the [LH settings] screen.

4 Click [System settings].



» The details of the system settings data are displayed on the right side of the screen.

Tips

- When you click [System settings], the button turns orange (selected state).
- System settings are the settings in [Device Settings], [Measurement Settings], [Data output], and [Maintenance]. You can also select settings from the tree that is displayed on the left side of the screen.

To continue with the procedure for changing the settings, see "■ Reading data from LH-600F/FG and editing it" on page 52 in "5.1 System Settings".

5.2 Tolerance Settings

You can read tolerance settings data and edit the settings. You can also apply the edited settings to LH-600F/FG or save them to the PC.

Tolerance settings data can be read from LH-600F/FG with the following two methods.

- Directly read data from LH-600F/FG connected with a USB cable
- Read a file that was edited with this software and saved on the PC

■ Reading data from LH-600F/FG and editing it

To read tolerance settings data from LH-600F/FG, connect the PC and LH-600F/FG with a USB cable (A type–B type).

IMPORTANT

While LH-600F/FG is connected with a USB cable to a PC on which this software is installed, operations cannot be performed with the LH-600F/FG display unit.

To operate LH-600F/FG from the display unit, follow the procedures in this document to exit the software, or disconnect the USB cable.

For details about how to exit this software, see "3.3 Exiting" on page 25.

1 Connect the PC and LH-600F/FG with a USB cable (A–B type), and then start the software.

See "3.2 Connection and Startup" on page 21.

2 Click the [LH settings] menu item.

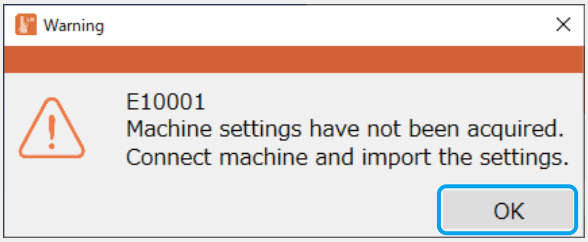
» The [LH settings] screen is displayed.

» The system settings data and tolerance settings data is read automatically and displayed on the [LH settings] screen.

IMPORTANT

If you click the [LH settings] menu item when you have never connected to LH-600F/FG and read the tolerance settings data, the following error message is displayed.

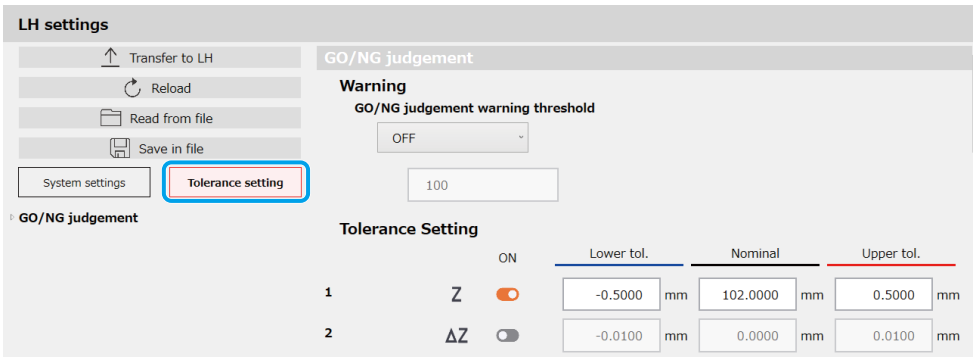
If the error message is displayed, click [OK], and repeat the procedure from step 1.



Tips

- You can also display the [LH settings] screen by clicking [LH settings] on the [Home] screen.
- For details about the [LH settings] screen, see "■ [LH settings] screen" on page 12.

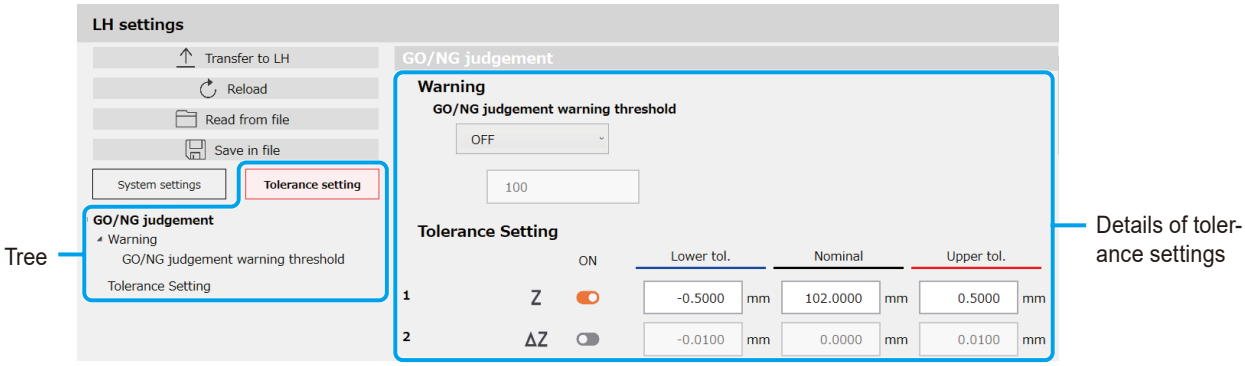
3 Click [Tolerance setting].



» The details of the tolerance settings data are displayed on the right side of the screen.

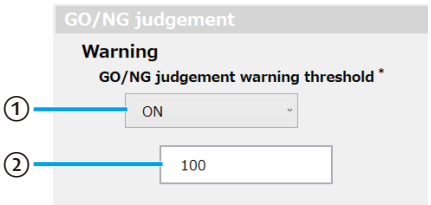
Tips

- If the software switches to offline mode after you have connected once, the most recently read tolerance settings data is displayed.
- When you click [Tolerance setting], the button turns orange (selected state).
- The tolerance settings are the settings in [Warning] and [Tolerance Setting].
  You can also select settings from the tree that is displayed on the left side of the screen.



4 Change the settings.

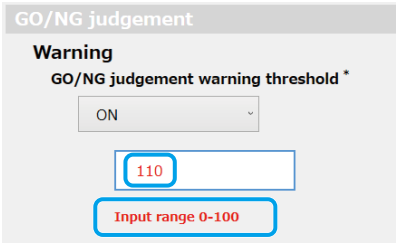
Settings for [Warning]



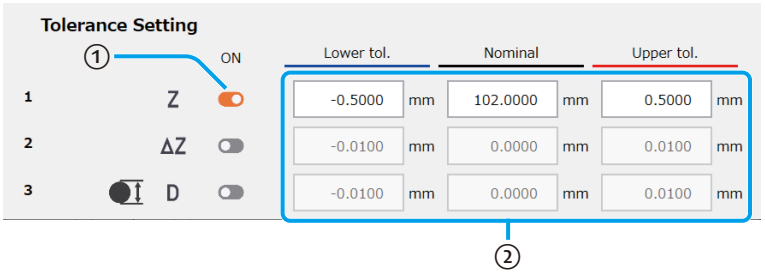
No.	Description
①	Selecting [ON] enables the warning function.
②	Input the desired threshold value in the input field.

Tips

- For details about the warning function and how to set it, see "3.1.2 GO/NG Judgment Warning" and "3.2.2 Configuring the Settings for the GO/NG Judgment Warning" in "PART B Measurement" in the separate LH-600F/FG User's Manual.
- If you input a number that cannot be set, the number is displayed in red and an error message is displayed, as shown in the following figure. Input the number again within the displayed range.



Settings for [Tolerance Setting]



No.	Description
①	The tolerance settings are enabled for the measurement items for which the ON/OFF button is set to ON ( ).
②	Input the nominal values and tolerances (lower tolerance and upper tolerance) as desired in the input fields.

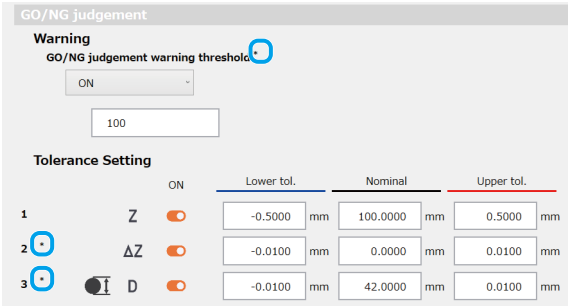
Tips

For details about GO/NG judgment and how to set it, see "3 GO/NG Judgment (Advanced Mode Only)" and “3.2.1 Configuring the Settings for the Tolerances" in "PART B Measurement" in the separate LH-600F/FG User's Manual.

» The settings are changed.

Tips

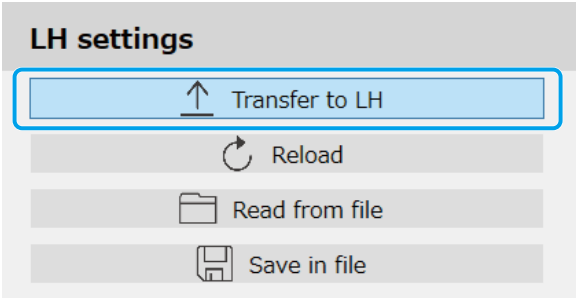
An asterisk (*) is displayed on settings that have been changed, as shown in the following figure.



5 Write the changed settings to LH-600F/FG or save them on the PC.

To write data to LH-600F/FG

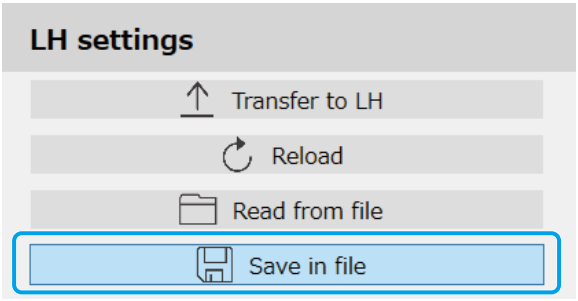
1 Click [Transfer to LH].



» The changed settings are written to the main unit.

To save data on the PC

1 Click [Save in file].



» The [Save] window is displayed.

2 Input a file name, and save the tolerance settings data in the desired location.

» The tolerance settings data is saved. (File extension: .lhc)

Tips

The "LH settings data" that is saved on the PC includes both "System settings data" and "Tolerance setting data".

■ Reading data from a file and editing it

The LH-600F/FG tolerance settings data can be saved on the PC with this software. Use the following procedure to read saved tolerance settings data into this software.

Tips

For details about how to save tolerance settings data on a PC, see "■ Reading data from LH-600F/FG and editing it" on page 58 in "5.2 Tolerance Settings".

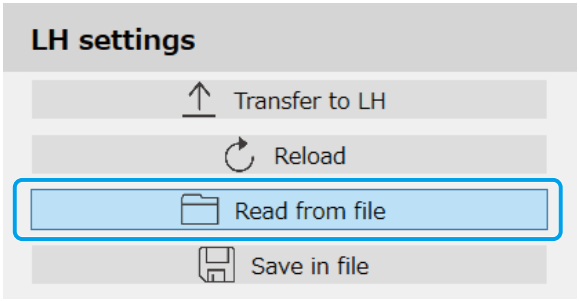
1 Click the [LH settings] menu item in this software.

» The [LH settings] screen is displayed.

Tips

You can also display the [LH settings] screen by clicking [LH settings] on the [Home] screen.

2 On the [LH settings] screen, click [Read from file].

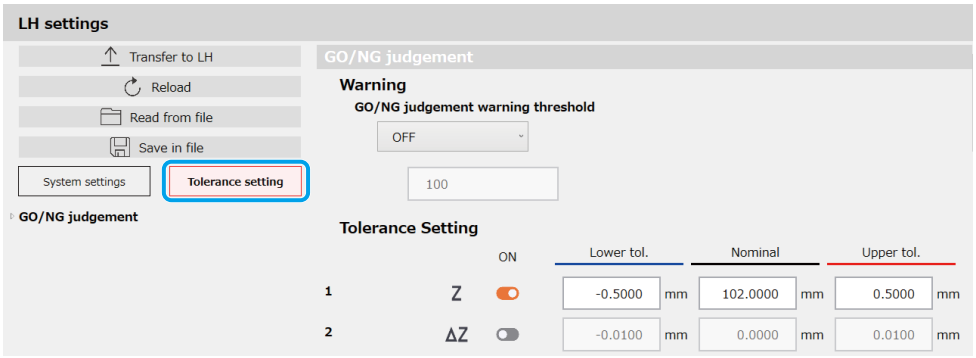


» The [Open] window is displayed.

3 Select the desired tolerance settings data, and click [Open].

» The tolerance settings data is displayed on the [LH settings] screen.

4 Click [Tolerance setting].



» The details of the tolerance settings data are displayed on the right side of the screen.

Tips

- When you click [Tolerance setting], the button turns orange (selected state).
- The tolerance settings are the settings in [Warning] and [Tolerance Setting].
  You can also select settings from the tree that is displayed on the left side of the screen.

To continue with the procedure for changing the settings, see "■ Reading data from LH-600F/FG and editing it" on page 58 in "5.2 Tolerance Settings".

6 Troubleshooting

If you notice any abnormal operation, first use the troubleshooting instructions to check the problem.
If the problem is not resolved, please contact a Mitutoyo sales office ("SERVICE NETWORK" on page App-1).

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6.1 Troubleshooting

If you notice any abnormal operations with this software, first use the troubleshooting instructions to check the problem.

For details about how to deal with error messages that appear during operation, see "6.2 Error Messages" on page 65.

IMPORTANT

If the problem is not resolved, please contact a Mitutoyo sales office ("SERVICE NETWORK" on page App-1).

■ Unable to connect in online mode

Point to check	Cause and remedy
Is the USB cable connected?	• On your PC, open Device Manager and check whether the USB cable is being recognized correctly. • For details about how to check, see "■ Checking the connection port" on page 24.
When starting this software, is any screen other than those listed on the right open on LH-600F/FG?	• An online connection can be established only when a specific screen is displayed on LH-600F/FG. • Start this software when either the home screen or a results screen (single result or result list) is displayed.

6.2 Error Messages

When an error message is displayed, first check this table of error messages.

IMPORTANT

If an error message is displayed that is not listed in the error message table, or if the problem is not resolved, please contact a Mitutoyo sales office ("SERVICE NETWORK" on page App-1).

Number	Message	Cause	Remedy
E10000	The machine is not connected.	• The USB cable is not connected. • There is a break in the USB cable. • An incorrect screen is displayed on the display unit.	See "■ Unable to connect in online mode" on page 64 in "6.1 Troubleshooting".
E10001	The machine settings have not been acquired.		
E10002	The result list in the machine has not been acquired.		
E10003	File data is invalid. File cannot be opened.	• The LH-600F/FG settings file (.lhf) saved on the PC is damaged.	Save a new file (LH settings data (.lhc)) on the PC and check whether it can be read into this software. For details about how to save a file, see "■ Reading data from LH-600F/FG and editing it" on page 52 in "5.1 System Settings" or "■ Reading data from LH-600F/FG and editing it" on page 58 in "5.2 Tolerance Settings".
E10004	The measurement result has not been acquired.	• Virtual elements have been registered in the part program for 2D measurement.	Delete virtual elements from the part program for 2D measurement, and then execute the part program to obtain measurement results. For details about 2D measurement, see “4. 2D Measurement (Advanced Mode Only)” in the separate User’s Manual for LH-600F/FG.

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