

Laser Marking System Laser Marker NAVI smart Quick Reference

LP-GS series
LP-RC series
LP-RF series
LP-RV series

This guide describes the following basic procedures:

- How to start test marking
- How to create a marking data

For more information about the Laser Marker NAVI smart software, refer to the “Laser Marker NAVI smart Operation Manual”.

Preface

Thank you for purchasing our product.

For full use of this product safely and properly, please read this document carefully.

This product has been strictly checked and tested prior to its delivery. However, please make sure that this product operates properly before using it. In case that the product becomes damaged or does not operate as specified in this document, contact the dealer you purchased from or our sales office.

The English version of this document is the original version. All other languages are translations that are based on the original documentation.

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How to Read this Document

■ Symbol description

| | |
|--|--|
|  Notice | “Notice” denotes any instructions or precautions for using this product. To prevent the damage or malfunction of the product, observe these precautions fully. |
|  Reference | “Reference” denotes any hints for operation, detail explanations, or references. |

■ Target model

This manual is subject to the following Laser Marker models.

In this manual, this product is called “laser marker”.

If the setting contents or specifications vary by models, the target models are specified in the text.

In the text, multiple models may be described collectively, as shown in the table below.

Please remind that the illustration and the screen image may vary with the model.

| Target model | | | Description in the text | | |
|--------------|--------------|--------------|-------------------------|--------------|--------------|
| LP-GS051 | LP-GS051-E | | LP-GS051 | LP-GS051(-L) | LP-GS series |
| LP-GS051-F | LP-GS051-FE | LP-GS051-FN | | | |
| LP-GS051-L | LP-GS051-LE | | LP-GS051-L | | |
| LP-GS051-LF | LP-GS051-LFE | LP-GS051-LFN | | | |
| LP-GS052 | LP-GS052-E | | LP-GS052 | | |
| LP-GS052-F | LP-GS052-FE | LP-GS052-FN | | | |
| LP-RC350S | | | LP-RC350S | | LP-RC series |
| LP-RF200P | | | LP-RF200P | | LP-RF series |
| LP-RV200P | | | LP-RV200P | | LP-RV series |

■ Type of manuals

For this product, the following manuals are prepared. Read each manual and operate this product correctly and safely. Also, save the manuals for future use.

Laser Safety Guide

This manual describes the items required for using this product correctly and safely. All users shall be required for reading this manual.

Setup/Maintenance Guide

This manual describes the items required for introduction and installation of this product as well as for the maintenance work.

- Product specifications, external dimensions
- Installation and connection method
- Signal details, I/O rating, and timing chart when I/O is used for control
- Maintenance details

Laser Marker NAVI smart Operation Manual

Instruction manual for the laser marker configuration software "Laser Marker NAVI smart". This manual describes the procedure and method to operate the laser marker, and the screen operations to set marking contents.

Mainly the users that operate this laser marker for actual marking procedure shall be required for reading this manual.

Serial Communication Command Guide

This manual describes the communication commands to control this product externally using the serial communication (RS-232C/Ethernet). It describes the communication settings, communication data formats, communication commands, and the control samples.

Mainly the machine builder and system integrator shall be required for reading this manual.

Serial Communication Command Guide: LP-400/V compatible mode

This manual describes the communication commands to control this product externally using the compatible command format with the previous models of LP-400/LP-V series.

Mainly the machine builder and system integrator shall be required for reading this manual.

⬇ Reference

- The PDF data of each manual is included on an attached CD-ROM "Laser Marker Smart Utility".
- To read the PDF manual, Adobe Reader (Version X or later) of Adobe Systems Incorporated is required.

Contents

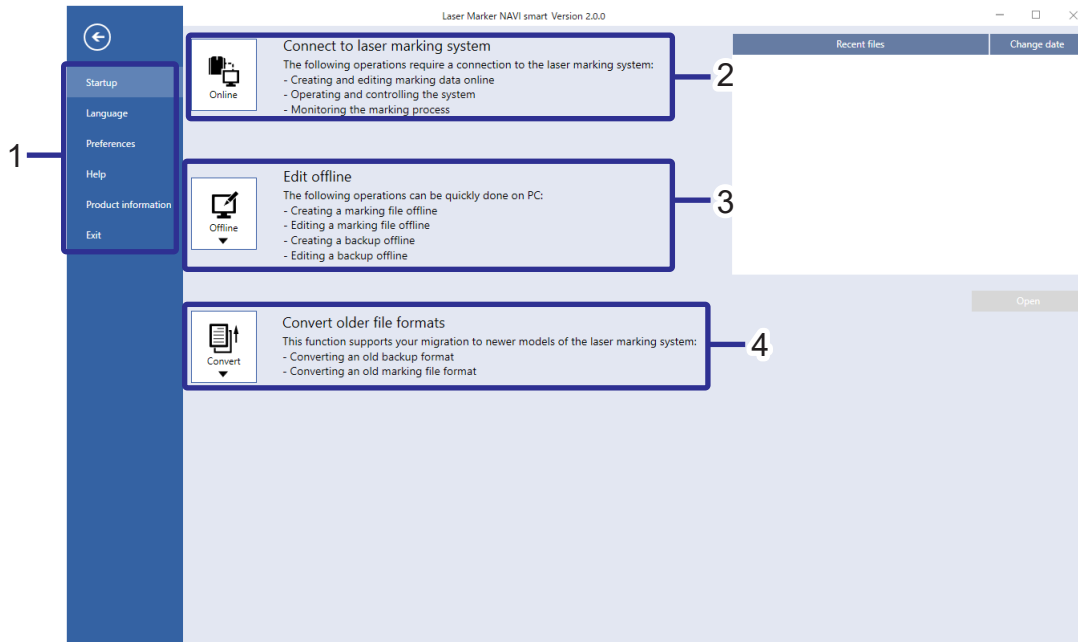
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1 Laser Marker NAVI smart Basics

1-1 “Startup” screen

When you launch Laser Marker NAVI smart, the “Startup” screen appears. You can select the software application among “Online”, “Offline”, or “Convert”.

■ User interface overview



| Item | Description |
|-----------|--|
| 1 Menu | With the menu tools, you can set the software preferences such as changing the user interface language and customizing user interface elements. |
| 2 Online | You can establish an online connection between your PC and the laser marking system. In online mode, you can configure the laser marking system and save the marking data to the laser marking system. |
| 3 Offline | In offline mode, you can create and edit marking files saved on local or network drives. |
| 4 Convert | You can convert a LP-400/LP-V backup file or marking file into the file format that is supported by LP-GS, LP-RC, LP-RF and LP-RV if you want to open it with Laser Marker NAVI smart. |

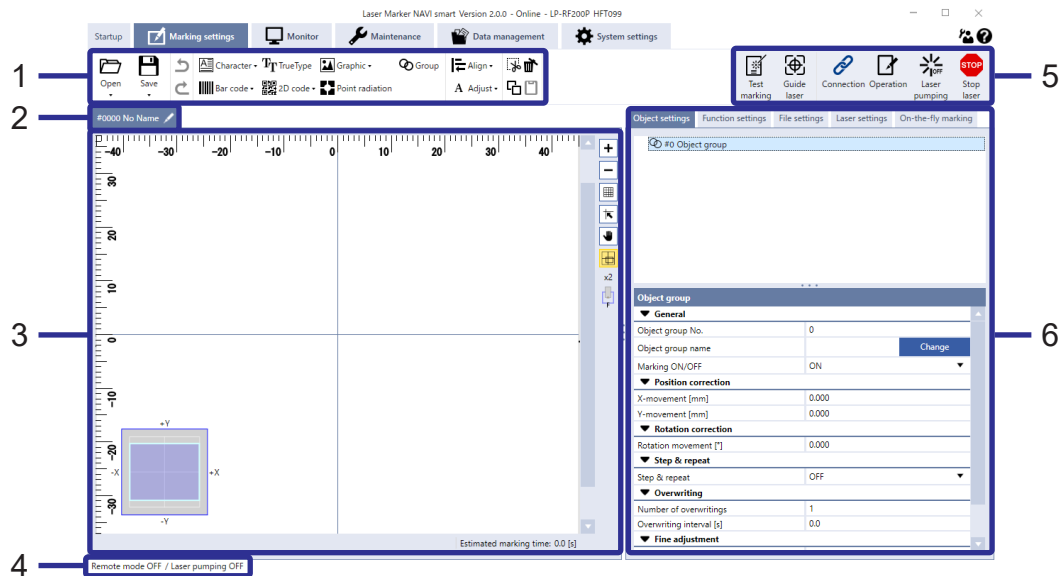
1-2 “Marking settings” screen

In this screen, you can create and edit marking data such as character, graphic and bar code objects and save them in a file. If you are logged in as “Restricted user”, only the parameters allowed to edit are available.

You can do the following:

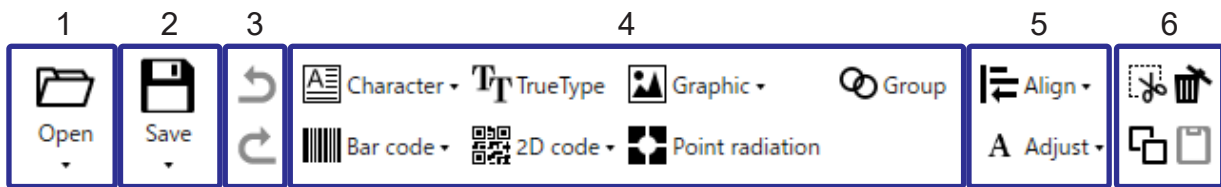
- Create new marking data.
- Edit a marking or backup file that is saved on a local or network drive (offline mode).
- Edit a marking file that is saved on the laser marking system (online mode).
- Execute test marking (online mode).

■ User interface overview



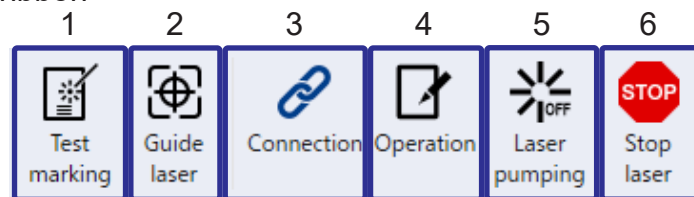
| Item | Description |
|------|--|
| 1 | Ribbon - setting tools You can use the tools to execute file handling, create or edit marking data. |
| 2 | File number and file name The number and name of the selecting file are displayed in the tab. |
| 3 | Marking image editor The image of marking data such as characters and graphics is displayed in this area. Refer to “Marking image editor” (P.10). |
| 4 | Status bar In online mode, it displays any of the following movement information: <ul style="list-style-type: none"> • Current operation mode (remote mode or RUN mode) • Laser pumping status (on or off) • Error number if any error is occurred |
| 5 | Ribbon - control tools You can use the tools to control the laser marking system in online mode. |
| 6 | Marking settings Set the marking data in the following tabs: <ul style="list-style-type: none"> • Object settings : Specify settings of the marking object such as character, graphic and bar code objects. • Function settings : Configure the function such as counter, expiry time and lot. • File settings : Specify the settings such as position, trigger parameters which are applied to all objects in a marking file. • Laser settings : Specify laser parameters such as laser power and scan speed. • On-the-fly marking : Specify on-the-fly marking settings if you want to mark a workpiece in motion. (LP-RC, LP-RF, LP-RV) |

■ Setting tools in the ribbon



| Item | Description | | | | | | | | | | | | | | | |
|------|--|-------------------|-------------|-------------------|--|------|----------|--|------|----------|--|--------|--------|--|-------|----------|
| 1 | Open | | | | | | | | | | | | | | | |
| 2 | Save | | | | | | | | | | | | | | | |
| 3 | Undo / redo | | | | | | | | | | | | | | | |
| | You can use these editing tools to revert the most recent operation. | | | | | | | | | | | | | | | |
| | <table border="1"> <thead> <tr> <th>Icon</th> <th>Description</th> <th>Keyboard shortcut</th> </tr> </thead> <tbody> <tr> <td></td> <td>Undo</td> <td>Ctrl + Z</td> </tr> <tr> <td></td> <td>Redo</td> <td>Ctrl + Y</td> </tr> </tbody> </table> | Icon | Description | Keyboard shortcut | | Undo | Ctrl + Z | | Redo | Ctrl + Y | | | | | | |
| Icon | Description | Keyboard shortcut | | | | | | | | | | | | | | |
| | Undo | Ctrl + Z | | | | | | | | | | | | | | |
| | Redo | Ctrl + Y | | | | | | | | | | | | | | |
| 4 | Marking objects | | | | | | | | | | | | | | | |
| | Create marking objects (“Character”, “TrueType”, “Graphic”, “Shapes”, “Bar code”, “2D code”, “Point radiation”). | | | | | | | | | | | | | | | |
| 5 | Align / adjust | | | | | | | | | | | | | | | |
| | To align or distribute selected objects, use the “Align” tool. To adjust a character object, use the “Adjust” tool. | | | | | | | | | | | | | | | |
| 6 | Basic editing tools | | | | | | | | | | | | | | | |
| | To perform basic operations, use any of the following icons: | | | | | | | | | | | | | | | |
| | <table border="1"> <thead> <tr> <th>Icon</th> <th>Description</th> <th>Keyboard shortcut</th> </tr> </thead> <tbody> <tr> <td></td> <td>Cut</td> <td>Ctrl + X</td> </tr> <tr> <td></td> <td>Copy</td> <td>Ctrl + C</td> </tr> <tr> <td></td> <td>Delete</td> <td>Delete</td> </tr> <tr> <td></td> <td>Paste</td> <td>Ctrl + V</td> </tr> </tbody> </table> | Icon | Description | Keyboard shortcut | | Cut | Ctrl + X | | Copy | Ctrl + C | | Delete | Delete | | Paste | Ctrl + V |
| Icon | Description | Keyboard shortcut | | | | | | | | | | | | | | |
| | Cut | Ctrl + X | | | | | | | | | | | | | | |
| | Copy | Ctrl + C | | | | | | | | | | | | | | |
| | Delete | Delete | | | | | | | | | | | | | | |
| | Paste | Ctrl + V | | | | | | | | | | | | | | |

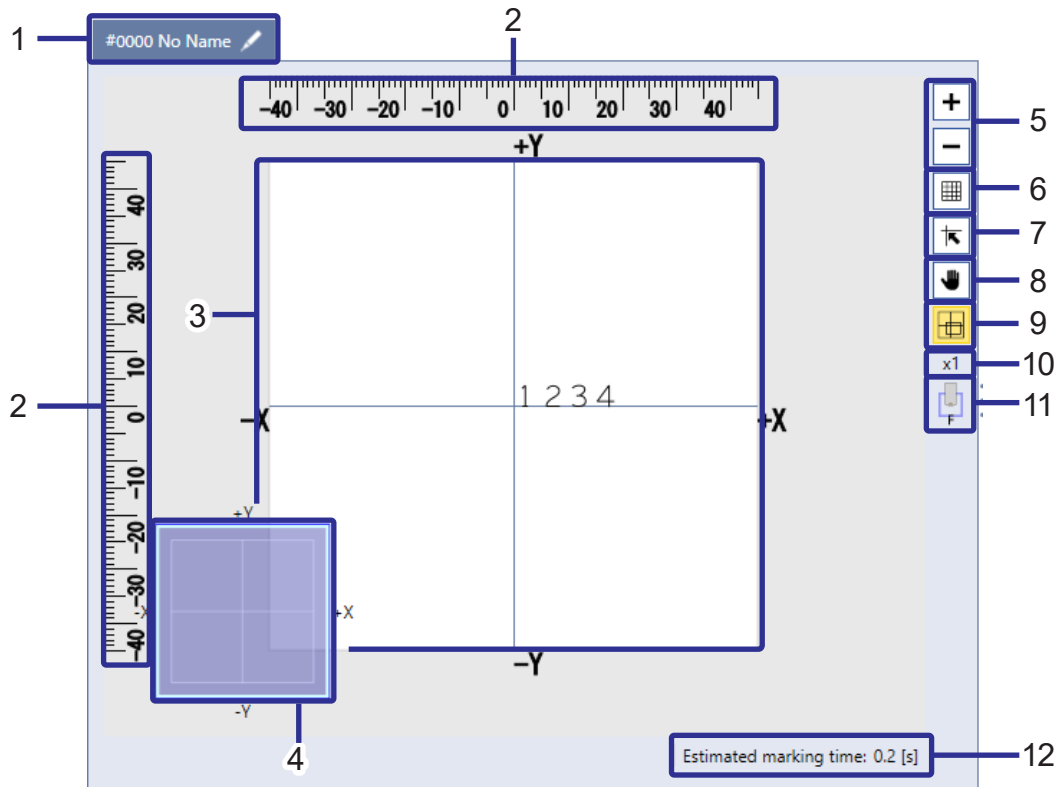
■ Control tools in the ribbon



| Item | Description |
|------|---------------------|
| 1 | Test marking |
| 2 | Guide laser |
| 3 | Connection |
| 4 | Operation |
| 5 | Laser pumping |
| 6 | “Stop laser” button |

■ Marking image editor

The marking image editor is part of the “Marking settings” screen and the “Monitor” screen.



| Item | Description | | |
|---------------|---|---------------|---------------------------------|
| 1 | File number and file name The number and name of the selecting file are displayed in the tab. | | |
| 2 | Ruler The rulers appear on the top and left side of the marking image editor. | | |
| 3 | Image display The image of marking data such as characters and graphics is displayed in this area. | | |
| 4 | Marking field overview It indicates which part of the marking field is displayed. | | |
| 5 | Zoom in / zoom out To enlarge or reduce the view of marking data, select the “+” or “-” icon. <table border="1" data-bbox="491 1391 1262 1435"> <tr> <td>Setting range</td> <td>magnification from x0.1 to x100</td> </tr> </table> | Setting range | magnification from x0.1 to x100 |
| Setting range | magnification from x0.1 to x100 | | |
| 6 | Grid Select this button to show or hide the grid lines. | | |
| 7 | Snap to grid To align the selected object along the grid, use this button. This function is available for the “Marking settings” screen. | | |
| 8 | Hand Select the hand button to pan around the marking image editor. | | |
| 9 | Show or hide marking field overview Select this button to show or hide the marking field overview. | | |
| 10 | Zoom level indication The zoom level changes when you enlarge or reduce the view of the marking data. | | |
| 11 | Laser head direction The icon shows the direction of the laser head specified in the “System settings” screen. “F” indicates the front of the laser head. | | |
| 12 | Estimated marking time The estimated marking time of the file is calculated based on the input data and settings. This function is available for the “Marking settings” screen. | | |

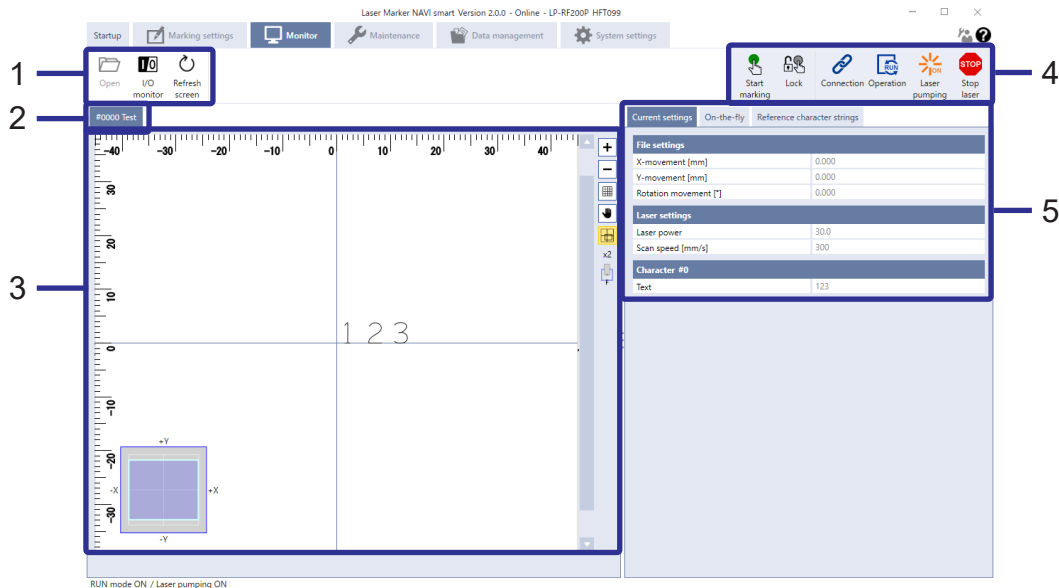
1-3 “Monitor” screen

In this screen, you can monitor the operation status of the laser marking system during remote mode or RUN mode.

You can do the following:

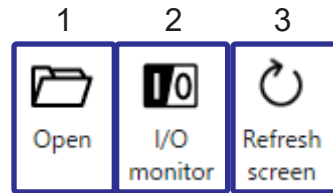
- Check the marking image.
- Check the marking settings.
- Check the ON or OFF status of I/O terminals.

■ User interface overview



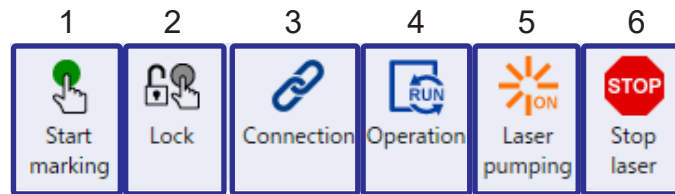
| Item | Description |
|------|--|
| 1 | Ribbon - setting tools You can use the tools to open a marking file or show the I/O monitor. |
| 2 | File number and file name The number and name of the selecting file are displayed in the tab. |
| 3 | Marking image editor The image of marking data such as characters and graphics is displayed in this area. Refer to “Marking image editor” (P.10). |
| 4 | Ribbon - control tools You can use the tools to control the laser marking system in online mode. |
| 5 | Marking settings You can check the marking data in the following tabs: <ul style="list-style-type: none"> • Current settings : You can check some of the marking parameters that are enabled in “System settings” > “Access permissions” in advance. • On-the-fly : You can check the status of on-the-fly marking (“ON”/“OFF”) and the line speed. • Reference character strings : The specified reference character strings are listed. |

■ Setting tools in the ribbon



| Item | Description |
|------------------|---|
| 1 Open | You can select and open a marking file on the “Monitor” screen. |
| 2 I/O monitor | The status (“ON”/“OFF”) of the I/O terminals on the laser marking system is displayed. |
| 3 Refresh screen | This button is available in the ribbon, if you select “Button “Refresh screen”” in “Startup” > “Preferences” > “Screen refresh setting” > “Method”. Use the “Refresh screen” button to manually update the “Monitor” screen. |

■ Control tools in the ribbon



| Item | Description |
|-----------------------|--|
| 1 Start marking | In RUN mode, you can use this button to trigger the laser radiation manually. |
| 2 Lock | Use this tool to unlock or lock the “Start marking” button. |
| 3 Connection | Use this tool to establish or disconnect an online connection between the laser marking system and a PC. |
| 4 Operation | Use this tool to switch the laser marking system operation to remote or RUN mode. |
| 5 Laser pumping | Turns laser pumping on or off. |
| 6 “Stop laser” button | Terminates the laser radiation or disable the laser radiation temporarily. |

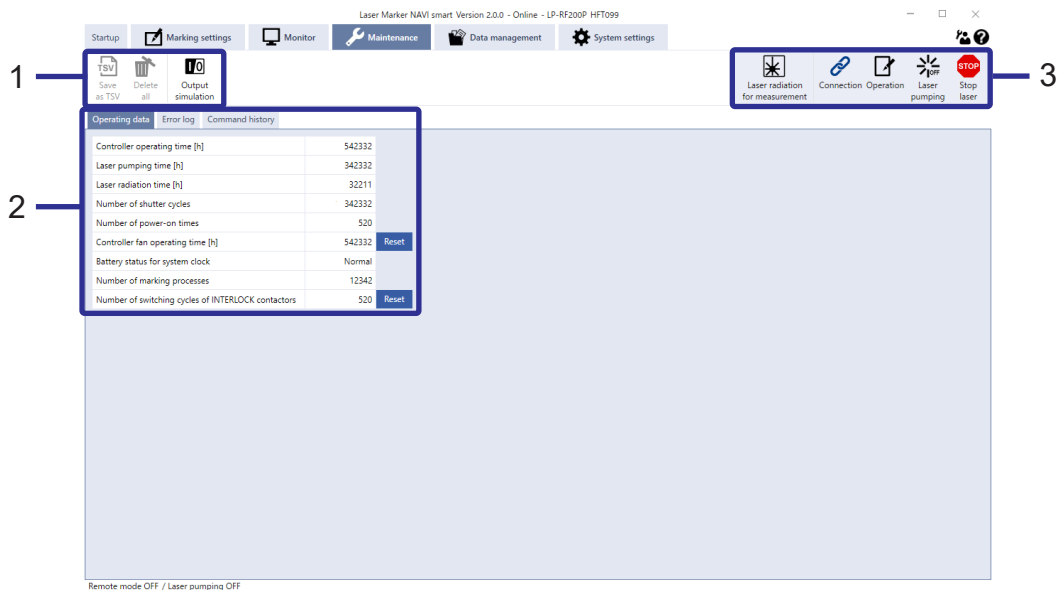
1-4 “Maintenance” screen

This screen is used for the maintenance of the laser marking system.

You can do the following:

- Check the operating data.
- Start laser radiation to measure the laser power (commercial power meter required).
- Simulate output operation.
- Check the communication command history.

■ User interface overview



| Item | Description |
|------|--|
| 1 | Ribbon - setting tools You can use the tools to perform output simulation, save or delete the operating information. |
| 2 | Maintenance data *1 You can check the operating information in the following tabs: <ul style="list-style-type: none"> • Operating data : You can check the operating data of the laser marking system, such as the total operating time of the each part. • Error log : You can view the error log. • Command history : The transmitted and received communication commands are displayed. |
| 3 | Ribbon - control tools You can use the tools to control the laser marking system in online mode. |

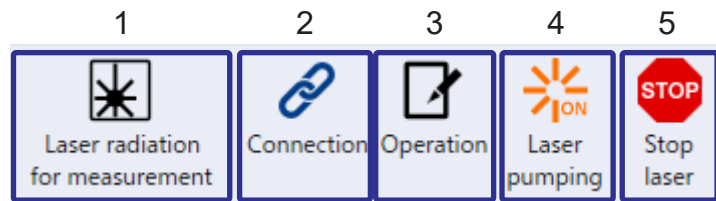
*1 : When you edit a backup file in offline mode, the data at the time of backup are displayed.

■ Setting tools in the ribbon



| Item | Description |
|---------------------|---|
| 1 Save as TSV | Exports the entries of the command history or erro log entries as a TSV file. |
| 2 Delete all | Deletes all log entries of the command history or erro log. |
| 3 Output simulation | Use the output simulation function to check the operation of external devices connected to the laser marking system by manually changing the status of an output. |

■ Control tools in the ribbon



| Item | Description |
|-----------------------------------|--|
| 1 Laser radiation for measurement | Use this function to inspect the laser power (commercial power meter required). |
| 2 Connection | Use this tool to establish or disconnect an online connection between the laser marking system and a PC. |
| 3 Operation | Use this tool to switch the laser marking system operation to remote or RUN mode. |
| 4 Laser pumping | Turns laser pumping on or off. |
| 5 "Stop laser" button | Terminates the laser radiation or disable the laser radiation temporarily. |

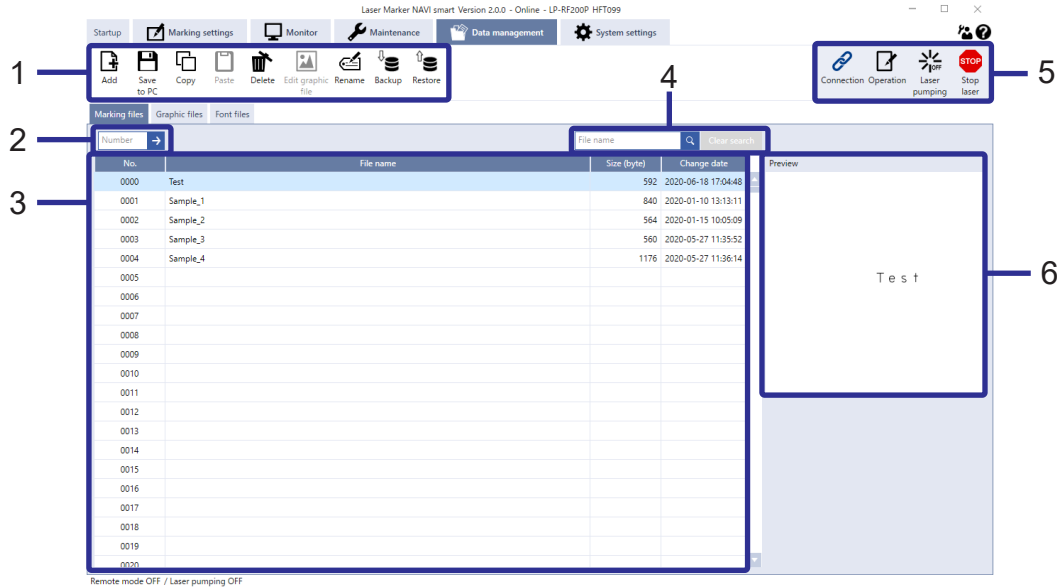
1-5 “Data management” screen

This screen lists all files that are currently saved on the laser marking system, including marking files, graphic files and font files.

You can do the following:

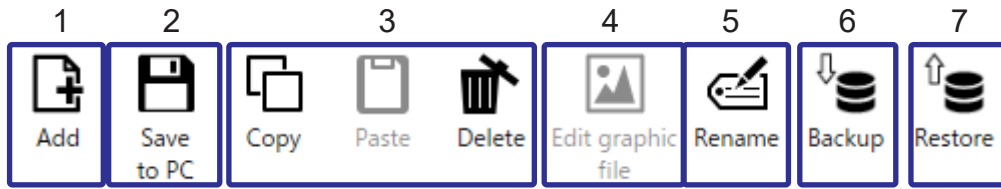
- Add or delete a marking file, graphic file, or font file.
- Copy a backup file from the laser marking system.
- Save a backup file or restore it to the laser marking system.

■ User interface overview



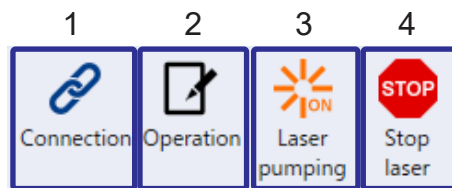
| Item | Description |
|------|--|
| 1 | Ribbon - setting tools You can add, delete or manage files in the laser marking system. |
| 2 | Search for file number You can search for a marking file by entering a file number. |
| 3 | File list All files that are currently saved on the laser marking system, including marking files, graphic files and font files are listed. |
| 4 | Search for file name You can search for marking files, font files, or graphic files by entering a character string in the search box. |
| 5 | Ribbon - control tools You can use the tools to control the laser marking system in online mode. |
| 6 | Preview Displays the image of the selected file. |

■ Setting tools in the ribbon



| Item | Description |
|-----------------------|---|
| 1 Add | Adds a marking file, graphic file, or font file to use it in the laser marking system. |
| 2 Save to PC | Saves a selected file to your local or network drive. |
| 3 Copy, Paste, Delete | To manage marking files, graphic files and font files, use the copy, paste, and delete functions. |
| 4 Edit graphic file | To edit a graphic file in the list, use this tool. |
| 5 Rename | To change the name of marking files, use this tool. |
| 6 Backup | Saves a backup file (.lmb) to your local or network drive. |
| 7 Restore | Restores an existing backup file (.lmb) to your laser marking system. |

■ Control tools in the ribbon



| Item | Description |
|-----------------------|--|
| 1 Connection | Use this tool to establish or disconnect an online connection between the laser marking system and a PC. |
| 2 Operation | Use this tool to switch the laser marking system operation to remote or RUN mode. |
| 3 Laser pumping | Turns laser pumping on or off. |
| 4 "Stop laser" button | Terminates the laser radiation or disable the laser radiation temporarily. |

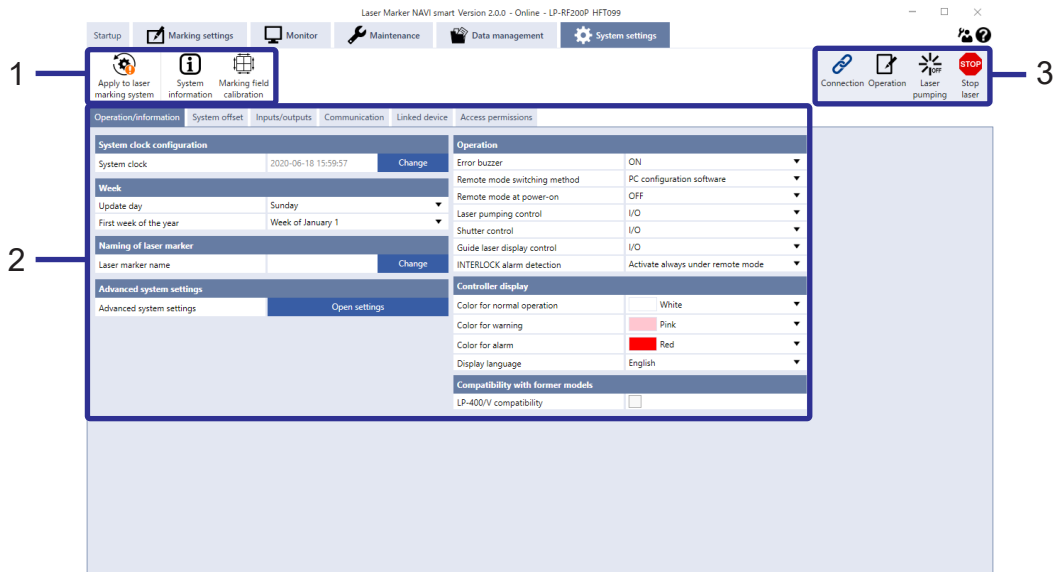
1-6 “System settings” screen

In this screen you set the system properties of the laser marking system.

You can do the following:

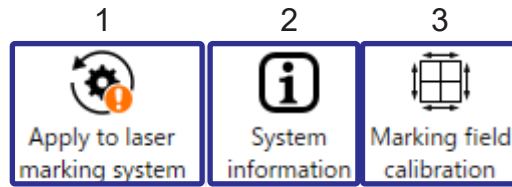
- Change the date and time of the system clock.
- Make settings for communication with external devices.
- Specify input and output settings.
- Set the administrator password.
- Make settings for laser power correction and marking position offset.

■ User interface overview



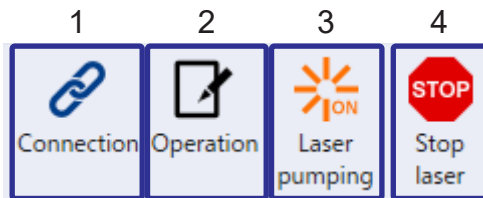
| Item | Description |
|------|---|
| 1 | Ribbon - setting tools You can update the system settings and view information about the laser marking system. |
| 2 | System parameters You can configure the system parameters in the following tabs: <ul style="list-style-type: none"> • Operation/ information : Specify the date and time, remote mode settings and other operational preferences. • System offset : Set the laser head direction, adjust the marking field position and laser settings. • Inputs/outputs : Specify input and output settings. • Communication : Specify communication settings for such as RS-232C, Ethernet and command format. • Linked device : Specify the settings for the imagechecker and code reader connection. • Access permission : Configure permissions for the “Restricted user” and customize the “Monitor” screen. |
| 3 | Ribbon - control tools You can use the tools to control the laser marking system in online mode. |

■ Setting tools in the ribbon



| Item | Description |
|------|--|
| 1 | Apply to laser marking system Updates the system settings in the laser marking system. If any changes are made, “!” symbol is appeared on the icon. |
| 2 | System information Displays information about the laser marking system, such as version or serial number. |
| 3 | Marking field calibration You can adjust the marking field position when it is misaligned. It is available for LP-RF and LP-RV. |

■ Control tools in the ribbon

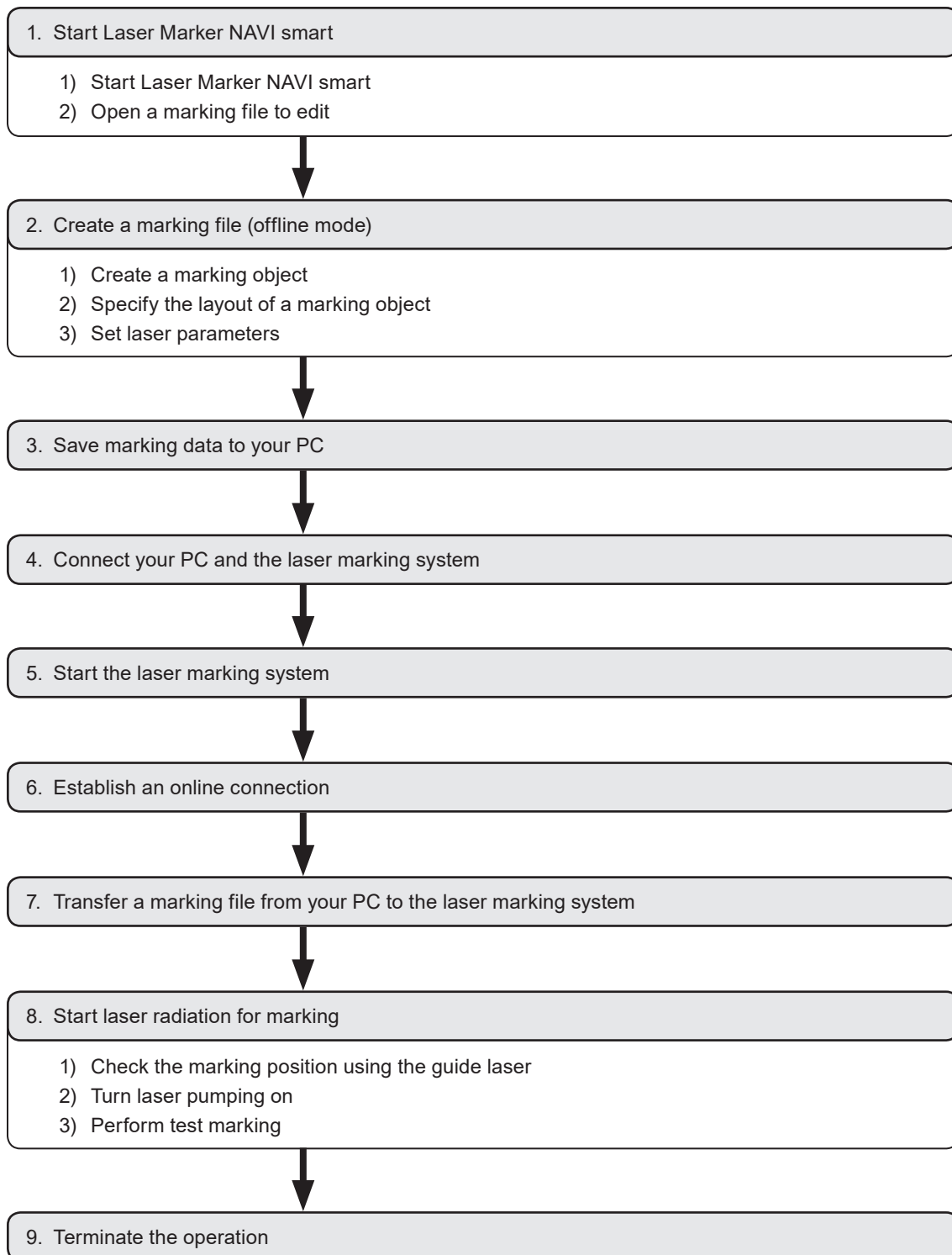


| Item | Description |
|------|--|
| 1 | Connection Use this tool to establish or disconnect an online connection between the laser marking system and a PC. |
| 2 | Operation Use this tool to switch the laser marking system operation to remote or RUN mode. |
| 3 | Laser pumping Turns laser pumping on or off. |
| 4 | “Stop laser” button Terminates the laser radiation or disable the laser radiation temporarily. |

2 Let's Use Laser Marker NAVI smart

■ Setting and operating procedures

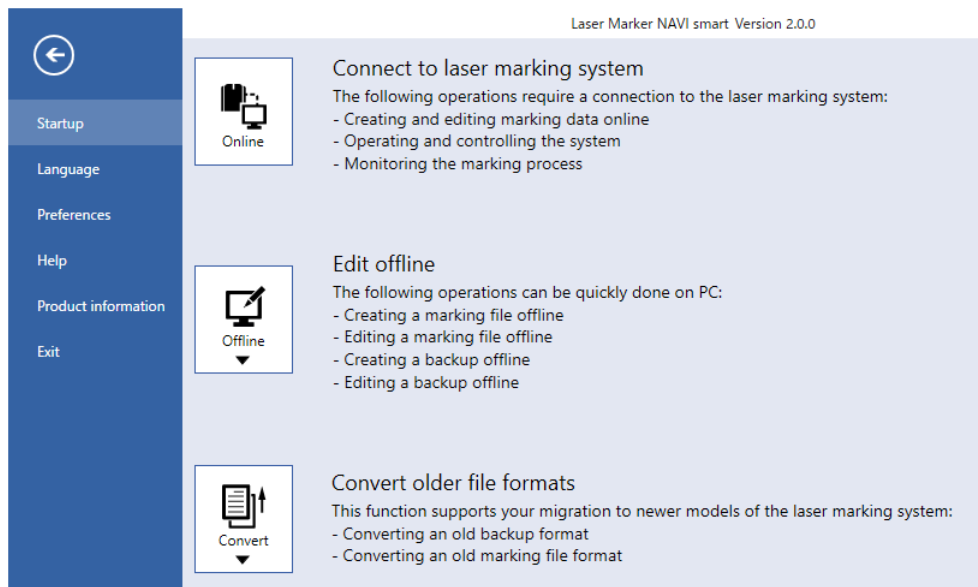
Follow the steps to configure marking settings and perform marking.
A typical step by step example is given below.



2-1 Start Laser Marker NAVI smart

2-1-1 Start Laser Marker NAVI smart

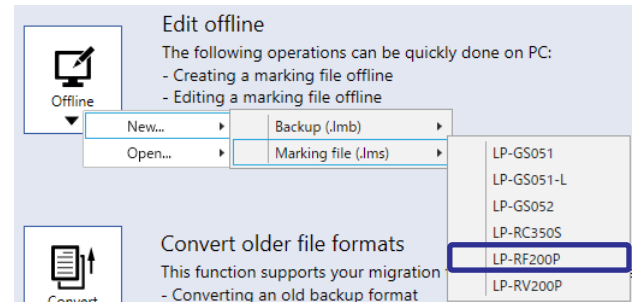
1. Open the start menu and select “Panasonic-ID SUNX Laser” > “Laser Marker NAVI smart”.
2. Laser Marker NAVI smart starts and displays the “Startup” screen.



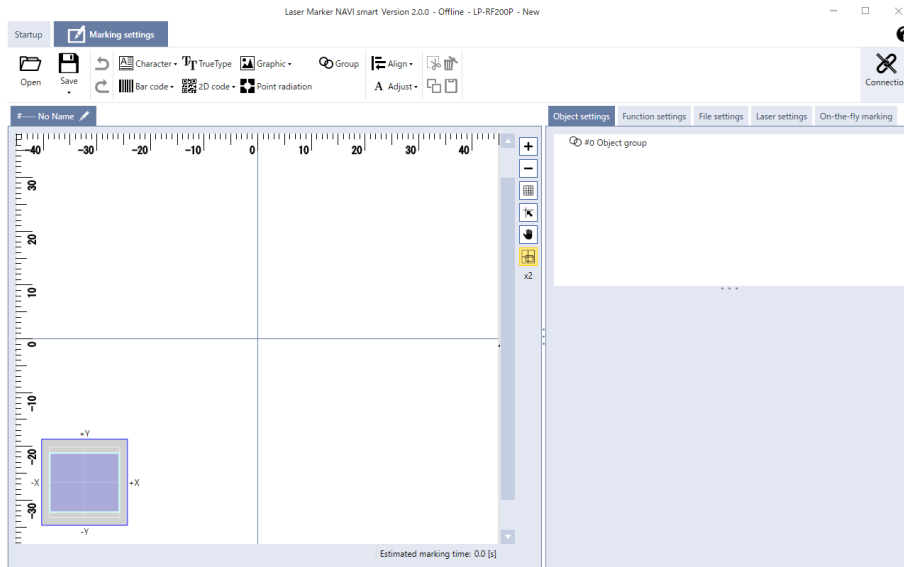
2-1-2 Open a marking file to edit

Select “New...” > “Marking file (.lms)” and select the model of your laser marking system.

In this example, LP-RF200P is selected.



The “Marking settings” screen opens with an empty marking image editor.



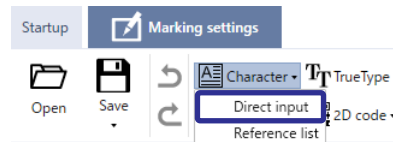
2-2 Create a marking file (offline mode)

2-2-1 Create a marking object

Create marking objects and specify the desired marking settings.

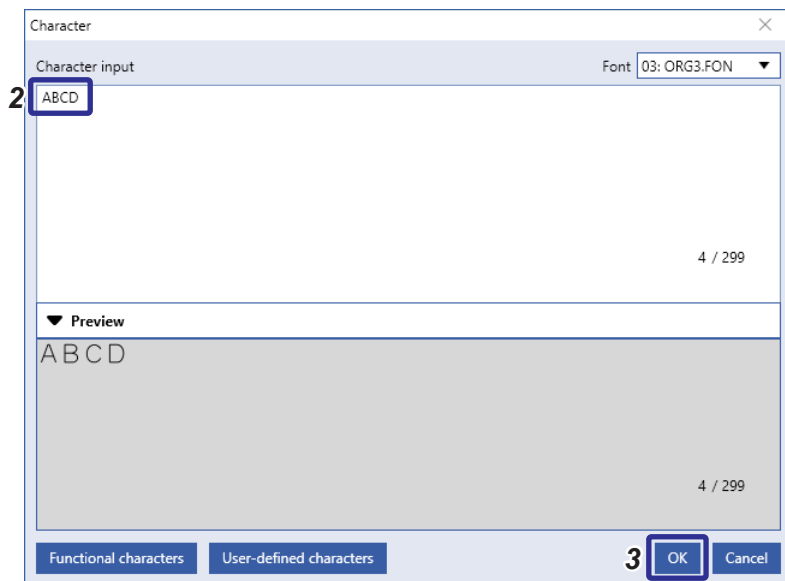
A typical procedure to set a marking object, for example character text "ABCD" are given below.

1. Select "Character" > "Direct input" in the ribbon.



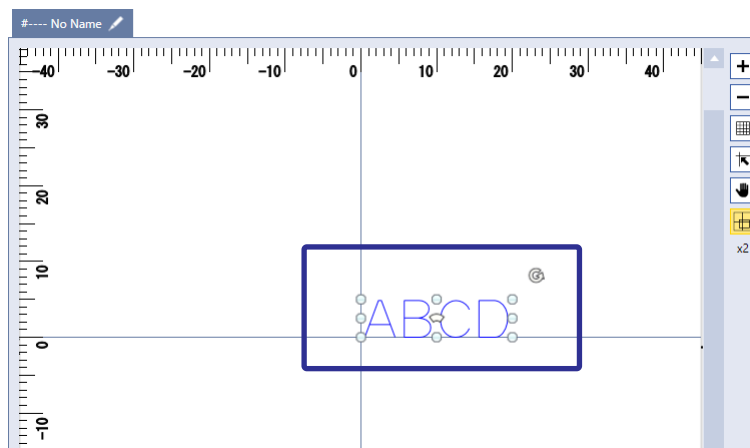
2. In the dialog, enter the text for your character object.

Make sure that the entered text is displayed in the "Preview" window.



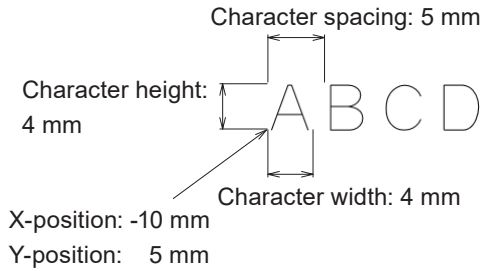
3. Select "OK".

4. The entered text is displayed in the marking image editor.



2-2-2 Specify the layout of a marking object

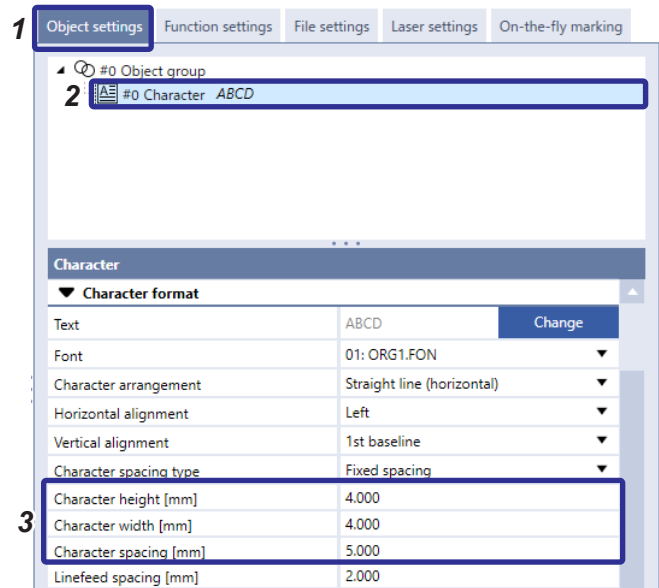
Typical procedures to set a marking object, for example to set character text "ABCD", are given below.



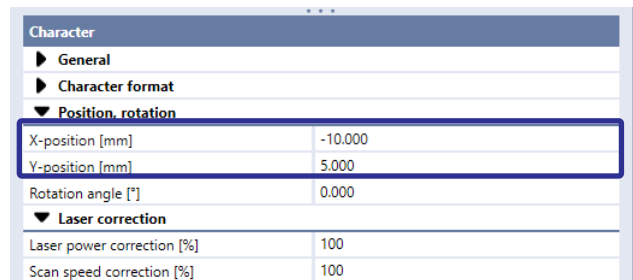
1. Open the "Object settings" tab.

2. To edit the parameters of the character object, select the object in the object list or in the marking image editor.
The parameters are displayed in the category below the object list.

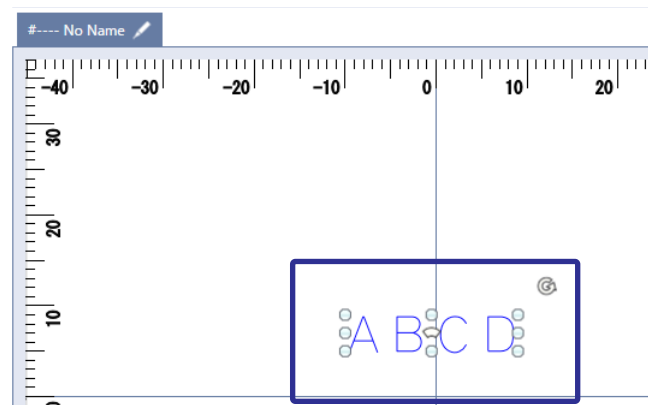
3. Specify the character size.
Character height: 4 mm
Character width: 4 mm
Character spacing: 5 mm



4. Under "Position, rotation", specify values for the following parameters:
X-position: -10 mm
Y-position: 5 mm



Confirm the layout displayed in the marking image editor.



2-2-3 Set laser parameters

Specify laser parameters that apply to all objects in the marking file, such as laser power and scan speed.

1. Open the “Laser settings” tab.

2. Specify the value for “Laser power”.

Laser power: 30.0

For test marking, it is recommended to set a lower laser power value. Check the marking quality and adjust the parameters gradually until the marking result meets your expectations.

3. Specify the value for “Scan speed [mm/s]”.

Scan speed [mm/s]: 300

Higher scan speed reduces the marking time and the thermal effect on the workpiece.

| Laser, speed | |
|-------------------|------|
| Laser power | 30.0 |
| Scan speed [mm/s] | 300 |
| Pulse cycle [µs] | 40.0 |

| Fine adjustment | |
|-------------------------------|--------------------------|
| Starting point | 0 |
| Ending point | 0 |
| Waiting time | 0 |
| Corners | 0 |
| Curve | 0 |
| Jump | 0 |
| Pre-scan time [ms] | 0.000 |
| Align the first shot position | <input type="checkbox"/> |

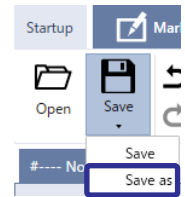
| Customize starting/ending point by object | |
|---|--------------------------|
| Customize to barcode/2D code | <input type="checkbox"/> |

Smart settings

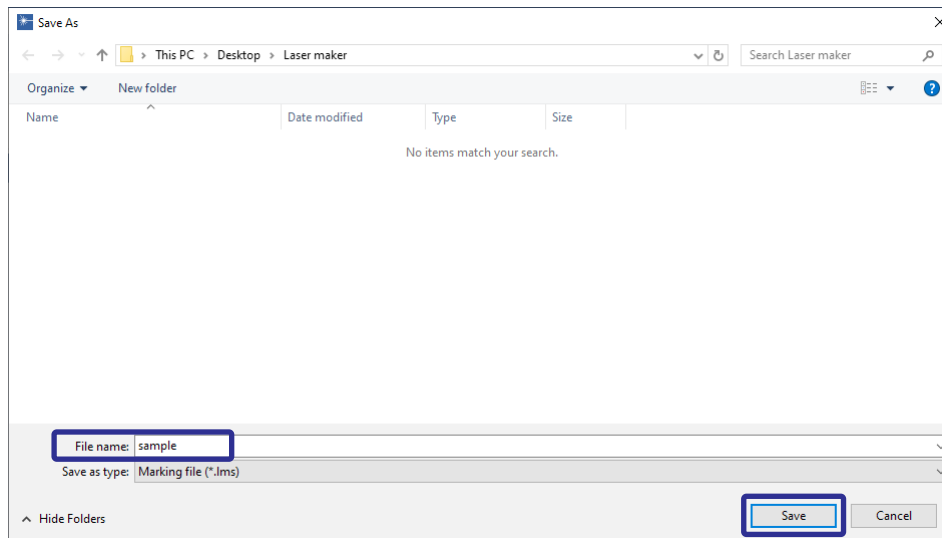
2-3 Save marking data to your PC

If you edit a marking file in offline mode, you must save it to your PC before you can transfer it to the laser marking system.

1. In the “Marking settings” screen, select “Save” > “Save as” in the ribbon.



2. Select the storage location, enter a file name and select “Save”.



The file is saved in the marking file format .lms to your local or network drive.

2-4 Connect your PC and the laser marking system

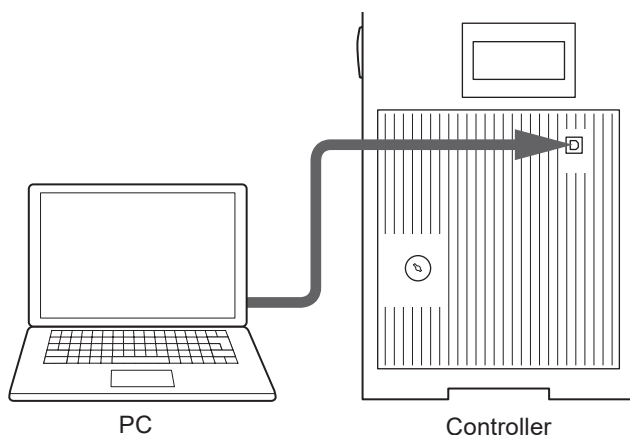
1. Connect the USB cable to the USB interface B on the controller.

! Notice

- Do not disconnect the USB cable while the laser marking system is online.

↓ Reference

- Before you can make an Ethernet connection, you must make the appropriate communication settings in Laser Marker NAVI smart. Connect the PC via USB to make these settings.
- If the laser marking system supports Bluetooth, before you can make a Bluetooth connection, you must make the appropriate communication settings in Laser Marker NAVI smart. Connect the PC via USB to make these settings.



2-5 Start the laser marking system



WARNING



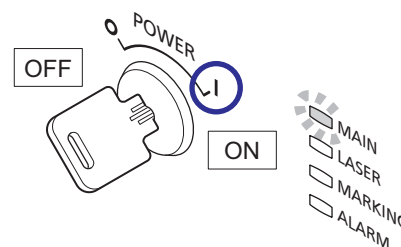
- In case of an emergency stop or an interlock, re-pumping of the laser marking system will be necessary. For safety reasons, construct a laser re-pumping system which must be operated by hand.

1. Setup the laser marker connecting head, controller and interfaces. For LP-RV, the oscillator unit should be also connected.

2. Turn on the key switch on the front of the controller.

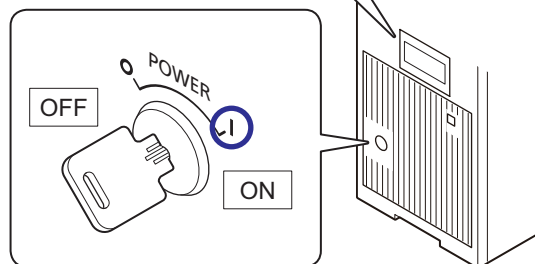
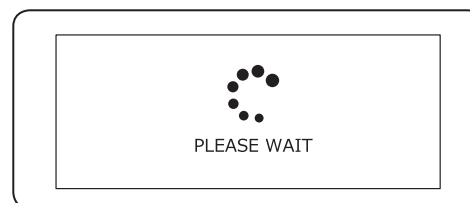
LP-GS:

MAIN LED on the controller blinks.



LP-RC, LP-RF, LP-RV:

The controller LED display lights and shows "PLEASE WAIT".



3. The system startup completes approximately after 10 seconds.

LP-GS:

MAIN LED on the controller lights up.

LP-RC, LP-RF, LP-RV:

The file number is displayed on the controller LED display.

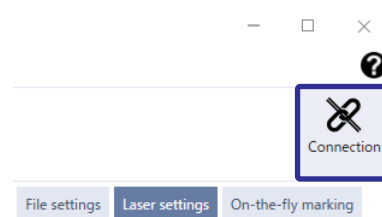


Notice

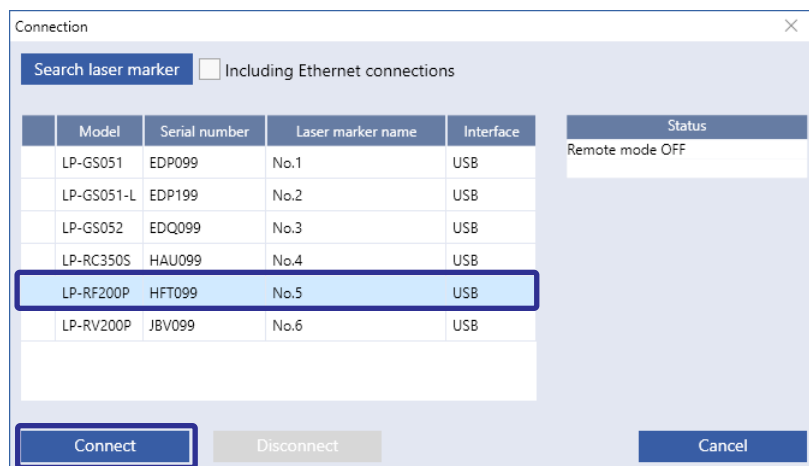
- Do not turn the key switch off before the system startup has been completed.
- If you turn off the power supply and turn on again soon after, leave the interval five seconds or more.
- LP-RC, LP-RF, LP-RV:
In case the file number is not displayed on the LED display after 10 second passes since turning on the key switch, contact our sales office or representatives.

2-6 Establish an online connection

1. Select the "Connection" tool in the ribbon.
Alternatively, go to the "Startup" screen and select "Online".
The "Connection" dialog appears.

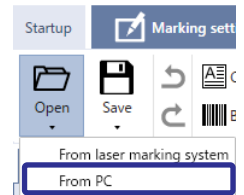


2. Select the laser marking system that you want to connect and select "Connect" to establish the connection.

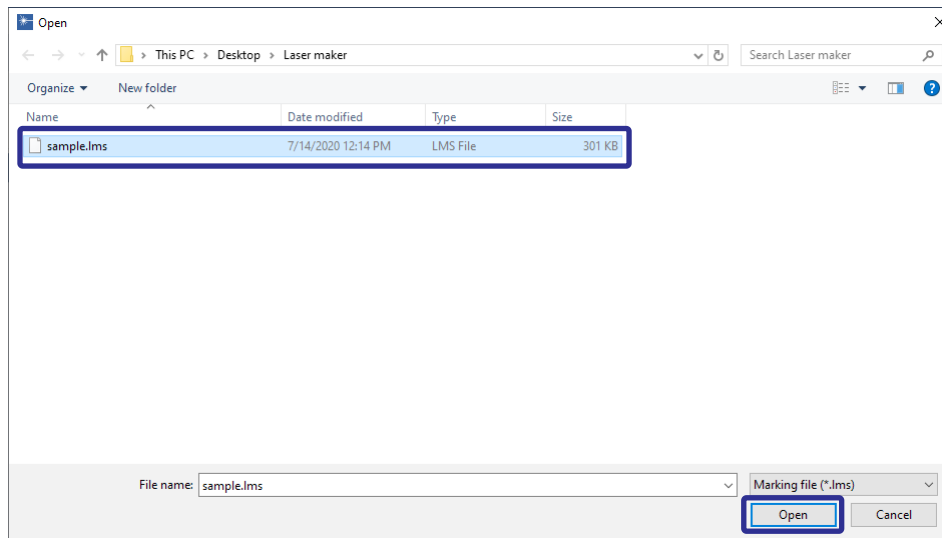


2-7 Transfer a marking file from your PC to the laser marking system

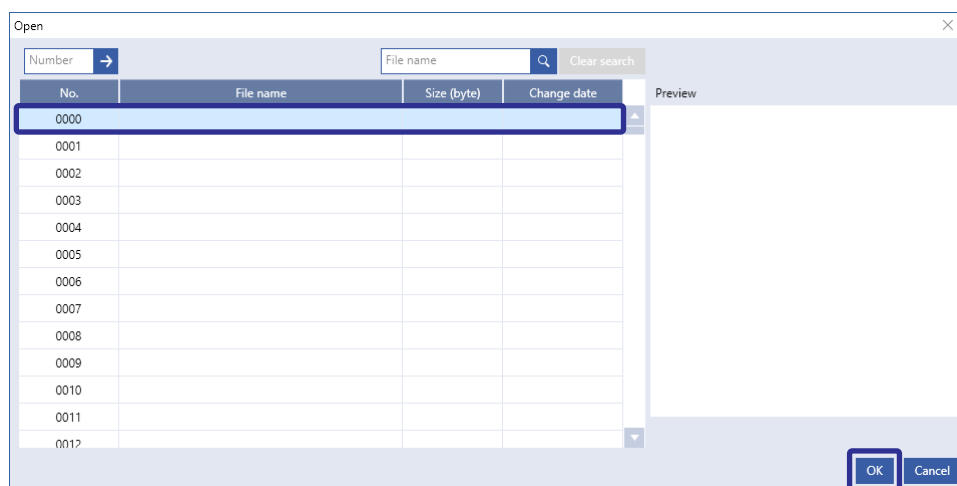
1. Go to the “Marking settings” screen and select “Open” > “From PC” in the ribbon.



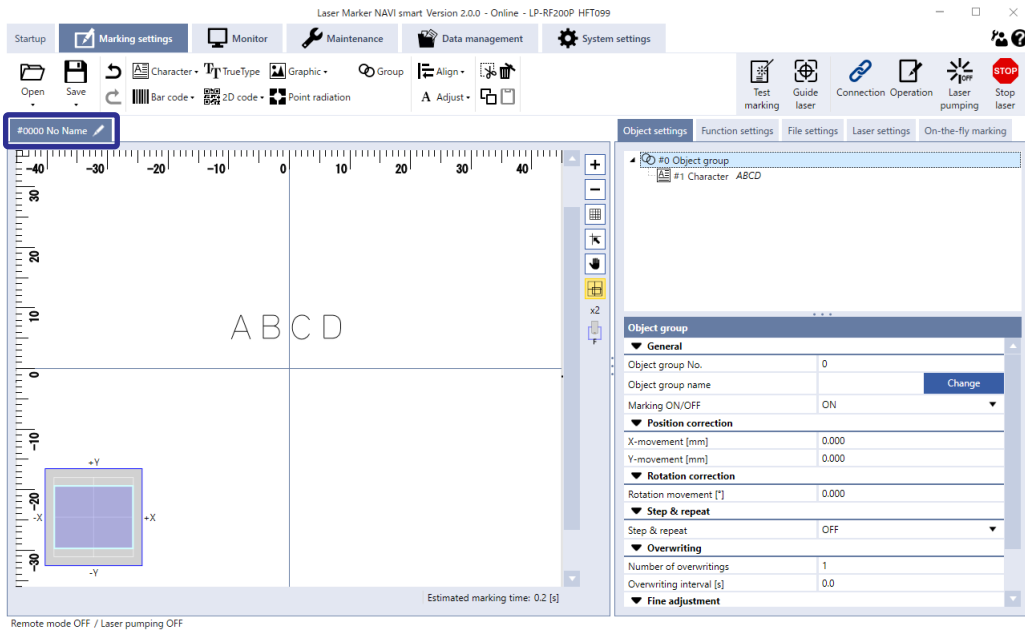
2. In the dialog, choose a marking file (.lms) from your local or network drive and select “Open”. A dialog opens and shows a list of all marking files saved on the laser marking system.



3. Select a table row to assign the marking file to a number on the laser marking system. Select “OK” to save the marking file on the laser marking system.



The marking file is opened in the “Marking settings” screen.



2-8 Start laser radiation for marking

2-8-1 Check the marking position using the guide laser

For LP-GS051, LP-GS051-L, LP-RC, LP-RF and LP-RV, you can use the guide laser to display the marking field, marking image, masked objects, or work distance. For LP-GS052, only the pointer is available as a guide laser function.

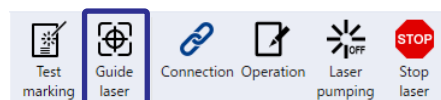
1. Set your workpiece on the marking position.

Set the appropriate work distance depending on your laser marking system.

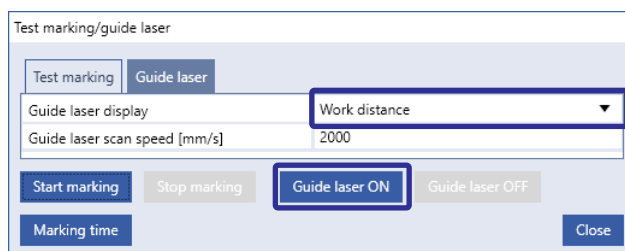
| Model | Work distance |
|--------------------|---------------|
| LP-GS501, LP-GS502 | 111 mm |
| LP-GS503 | 71 mm |
| LP-RC | 103 mm |
| LP-RF, LP-RV | 190 mm |

2. Select the "Guide laser" tool in the ribbon.

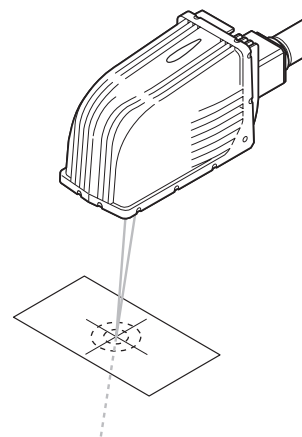
The "Test marking/guide laser" dialog appears.



3. Select "Work distance" for "Guide laser display" and select "Guide laser ON" to start radiating the guide laser.

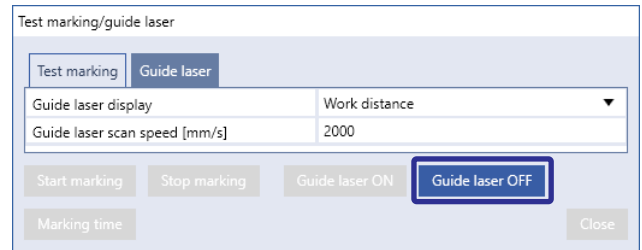


Adjust the work distance so that the dot overlaps with the center of the crosshairs.

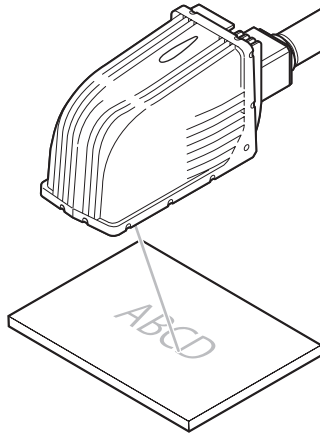


The guide laser indicates the work distance.

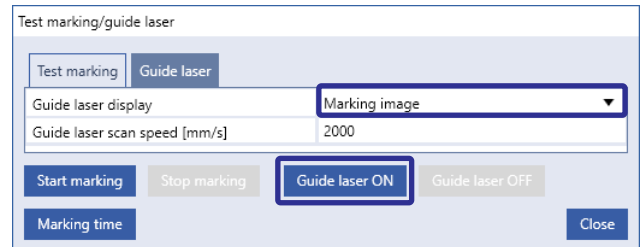
4. Select "Guide laser OFF" to stop the radiation of the guide laser.



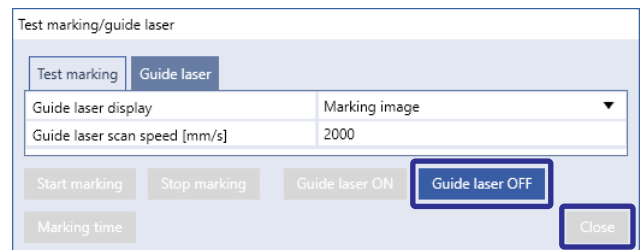
5. Select "Marking image" for "Guide laser display" and select "Guide laser ON" to start radiating the guide laser.
Move the workpiece to the desired marking position.



The guide laser indicates the marking image.



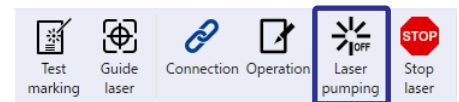
6. Select "Guide laser OFF" to stop the radiation of the guide laser.
7. To exit the dialog, select "Close".



2-8-2 Turn laser pumping on

Turn laser pumping on to enable the lasing process.

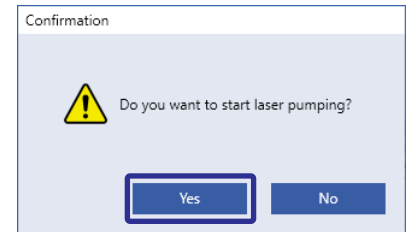
1. Select the “Laser pumping” tool in the ribbon.



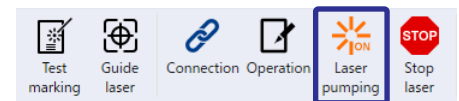
2. In the confirmation dialog, select “Yes” to start laser pumping.

A certain amount of time is required to complete laser pumping for the different laser marking systems:

- LP-GS: approx. 8-15s
- LP-RC: approx. 10s
- LP-RF: approx. 7s
- LP-RV: approx. 1s

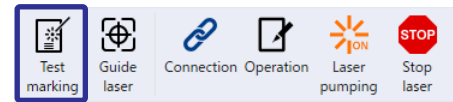


3. After a few seconds, laser pumping is completed and the status icon of the “Laser pumping” tool changes.



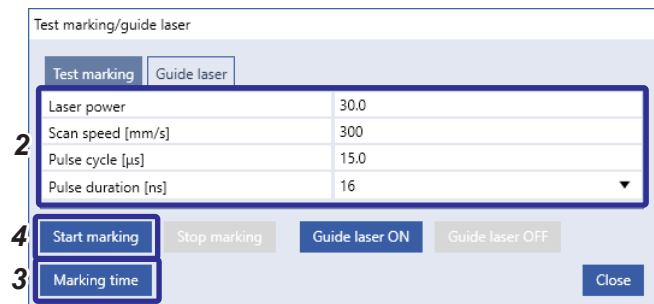
2-8-3 Perform test marking

1. Select "Test marking" in the ribbon.



2. In the dialog, check the values for the laser settings and change them if required.

The available parameters depend on the model of your laser marking system.



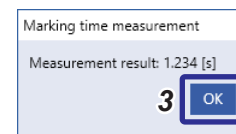
3. Select "Marking time" to perform the measurement.

The marking time is displayed in the dialog.

To exit the dialog, select "OK".

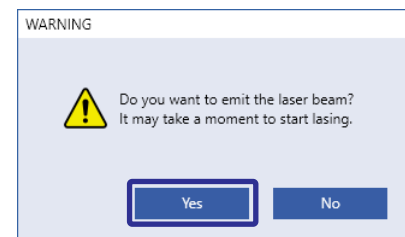
4. Select "Start marking" to trigger the laser radiation.

A confirmation dialog appears.



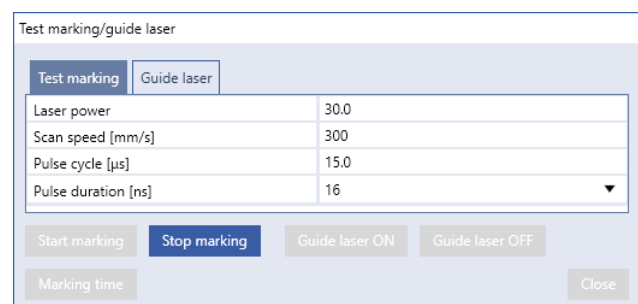
5. Select "Yes" to start laser radiation.

The shutter opens automatically and marking starts.

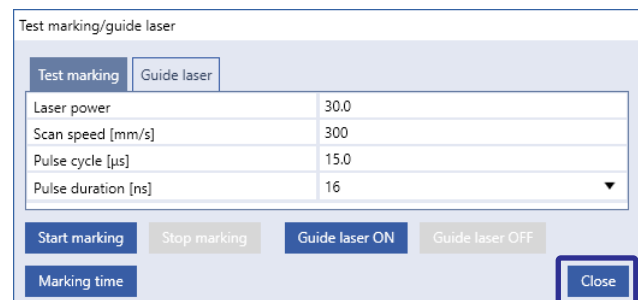


- Take appropriate protective measures during laser radiation such as wearing laser protective goggles or using a protective enclosure.

During a marking process, you can select "Stop marking" to terminate the test marking.



6. To close the dialog, select "Close".



2-9 Terminate the operation

1. To turn laser pumping off, select the “Laser pumping” tool in the ribbon.

“Laser pumping” tool



Laser pumping on



Laser pumping off

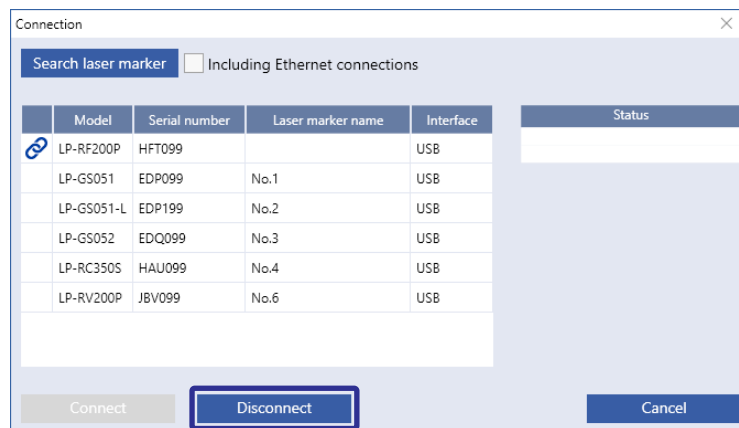
2. Select “Online” in the ribbon. Alternatively, go to the “Startup” screen and select “Online”.
The “Connection” dialog appears.



“Online” tool

3. Select “Disconnect”.

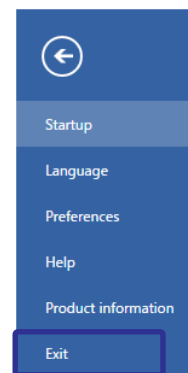
The online connection with the laser marking system is now disconnected.



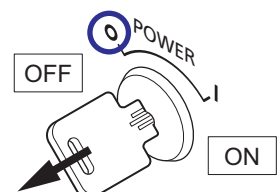
Notice

- Do not turn off the power supply during an online connection with your PC. Otherwise a data loss or system failure may occur.

4. Go to the “Startup” screen and select “Exit” from the menu.
Alternatively, select “X” in the upper right corner of the screen.



5. Turn off the power of the laser marking system and remove the key from the controller.
The laser safety officer must keep the key.



3 Create Various Marking Data

3-1 Mark date and time

Set the functional characters to mark the automatically updated date and time. The procedures to set the current time are given below.

■ Example

13 29
hour minute

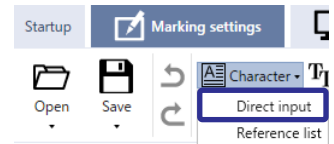
| Item | Setting |
|----------------------|-------------------|
| Number of characters | 2 |
| Date/time type | Hour (24), Minute |
| Zero indication | Zero fill |

Notice

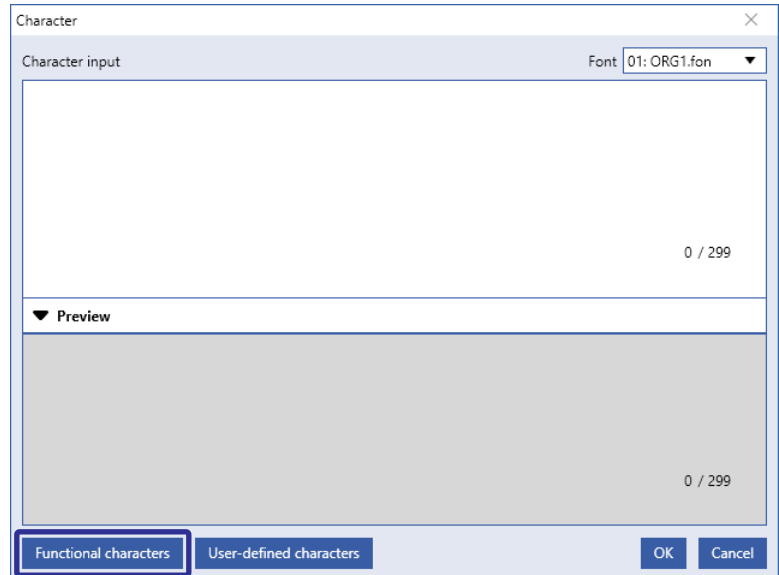
- Functional characters such as current date and time or lot are based on the system clock of the laser marking system. It may happen that the system clock deviates from the accurate time due to errors of internal parts or low battery level. Therefore, check the system clock in the laser marking system regularly to ensure that the date and time are correct.

■ Setting procedures

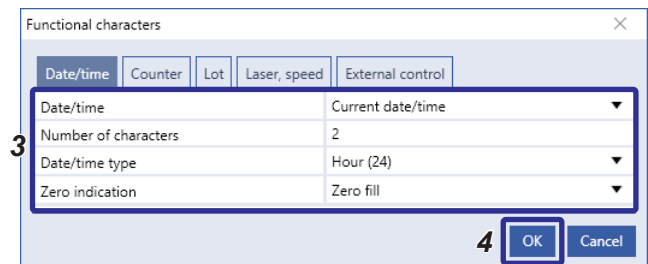
1. In the "Marking settings" screen, select "Character" > "Direct input" in the ribbon.
The "Character" dialog opens.



2. Select "Functional characters".
The "Functional characters" dialog opens.

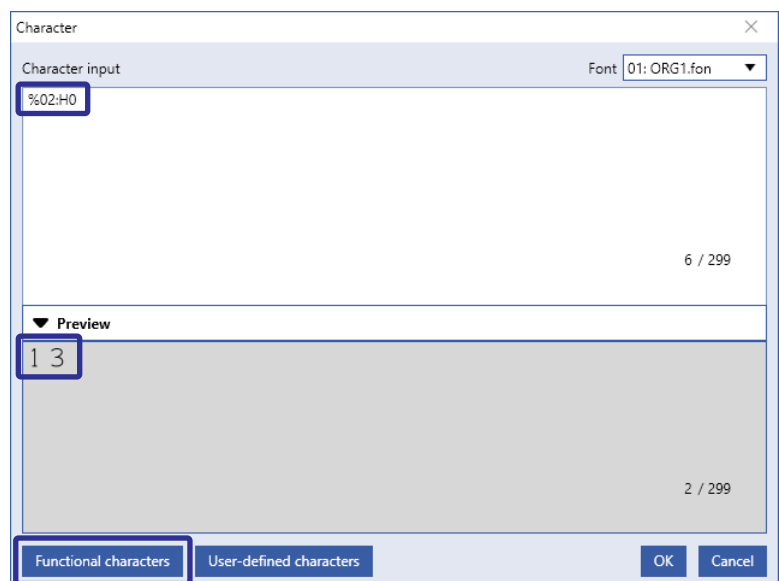


3. Select the "Date/time" tab and specify the parameters of the functional character.
 - Date/time: Current date/time
 - Number of characters: 2
 - Date/time type: Hour (24)
 - Zero indication: Zero fill



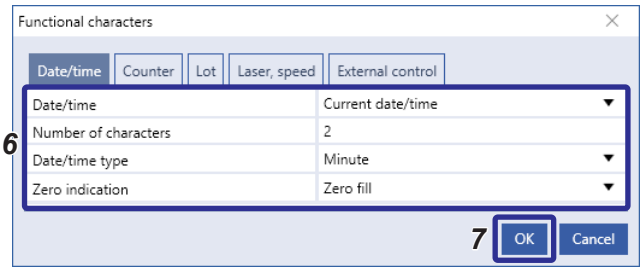
4. Select "OK".
In the input window, "%02:H0" is displayed.
Check the functional characters in the "Preview" window.

5. Select "Functional characters".
The "Functional characters" dialog opens.



6. Select the "Date/time" tab and specify the parameters of the functional character.

- Date/time: Current date/time
- Number of characters: 2
- Date/time type: Minute
- Zero indication: Zero fill

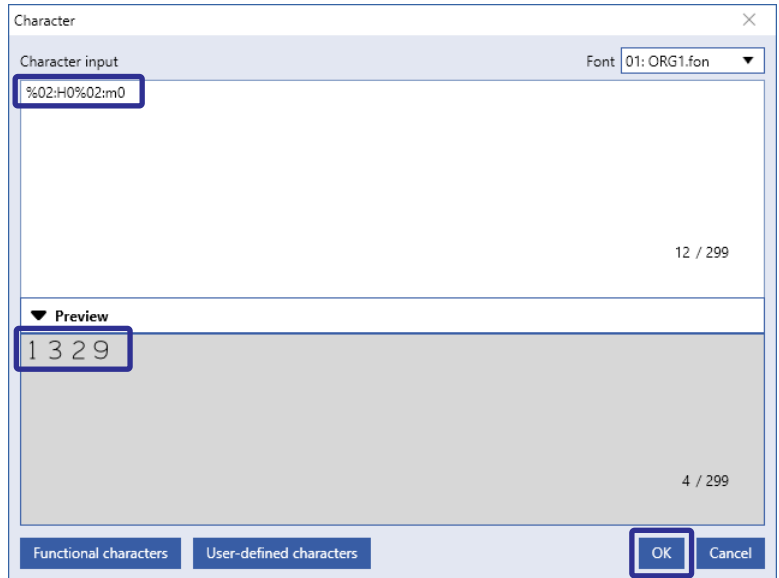


7. Select "OK".

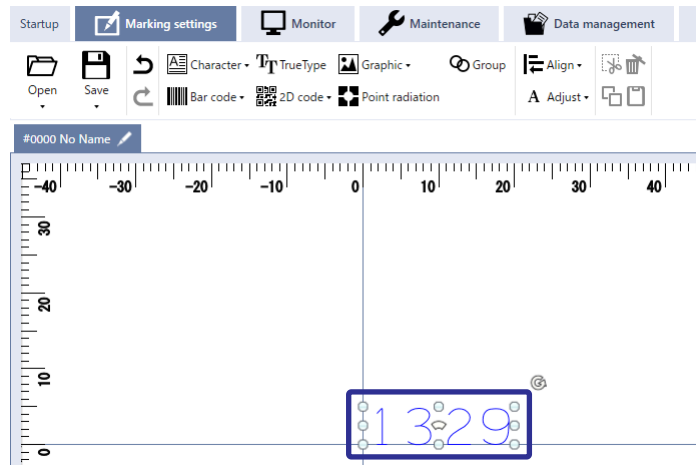
In the input window, "%02:H0%02:m0" is displayed.

Check the functional characters in the "Preview" window.

8. Select "OK" to close the dialog and return to the "Marking settings" screen.



9. Confirm that the current time is displayed in the marking image editor as the marking characters.



10. If required, change the parameters in the character object settings and laser settings.

Refer to "2-2 Create a marking file (offline mode)" (P.23).

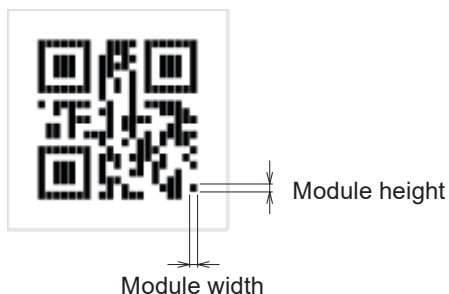
11. Perform the test marking.

Refer to "2-8 Start laser radiation for marking" (P.32).

3-2 Mark 2D code

The procedures to set a QR Code are given below.

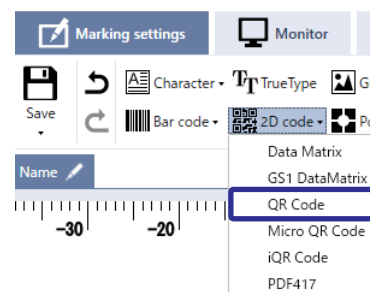
■ Example



| Item | Setting |
|------------------------|---------------------|
| Code type | QR Code, Model 2 |
| Code data | ABCDEFGHIJKLMN12345 |
| Error correction level | M |
| Module height | 0.500 mm |
| Module width | 0.500 mm |
| Human readable text | Disabled |

■ Setting procedures

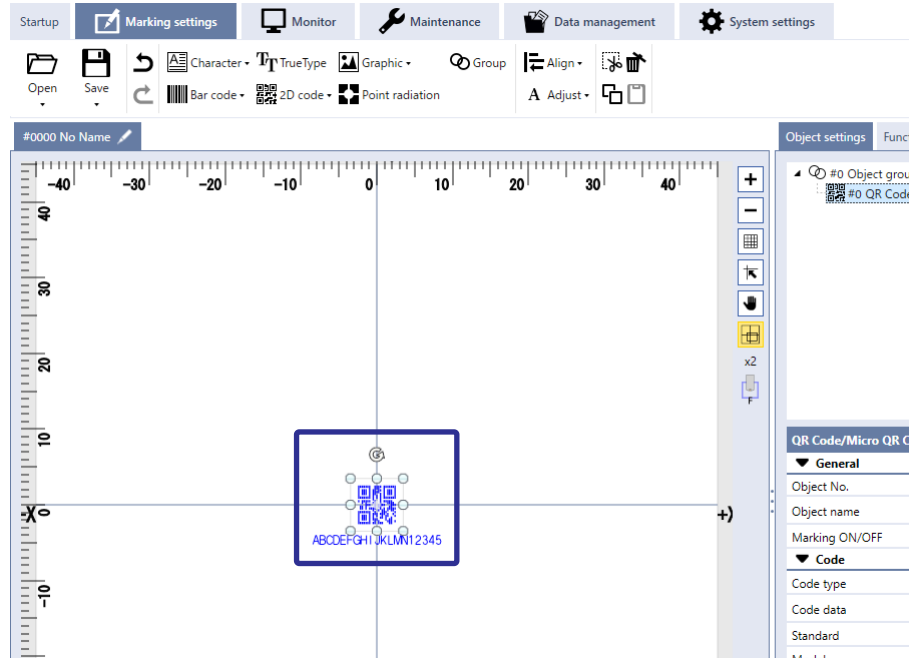
1. In the “Marking settings” screen, select “2D code” > “QR Code” in the ribbon. The “Code data” dialog opens.



2. Input the characters that you want to encode. In this example, “ABCDEFGHIJKLMN12345” is entered. Select “OK” to close the dialog and return to the “Marking settings” screen.



3. Confirm that the QR code is displayed in the marking image editor.



4. Depending on your code data, specify any of the following parameters:

- Standard: If the code data contains Simplified Chinese characters, select “GB/T 18284”. If you select “ISO/IEC 18004”, you can set Japanese characters.
- Mode (QR): Select the mode depending on the character type. If “Auto” is set, the mode is selected automatically depending on the code data.

5. Depending on your desired code specification, specify any of the following parameters:

- Model: In most cases, “Model2” is used.
- Error correction level
- Version: The allowed number of input characters depends on the selected version. If “Auto” is set, the version is selected automatically depending on the code data.
- Number of quiet modules: If “Auto” is selected, the quiet zone width is set according to the code's requirements for the minimum width.

| QR Code/Micro QR Code/QR Code | |
|-------------------------------|---|
| ▼ General | |
| Object No. | 0 |
| Object name | Change |
| Marking ON/OFF | ON |
| ▼ Code | |
| Code type | QR Code |
| Code data | ABCDEFGHIJKLNM12345 Change |
| 4 Standard | ISO/IEC 18004 |
| 5 Model | Model 2 |
| 4 Mode (QR) | Alphanumeric |
| Error correction level | M |
| 5 Version | Auto |
| Number of quiet modules | Auto (4) |
| 6 Module height [mm] | 0.500 |
| 6 Module width [mm] | 0.500 |
| Total height [mm] | 14.500 |
| Total width [mm] | 14.500 |

6. Specify the module size to enter the value of the following parameters:

- Module height [mm]
- Module width [mm]

In this example, 0.5mm is set for the both values.

The entire width and height of the code, including the quiet zone are displayed in “Total width [mm]” and “Total height [mm]”.

Reference

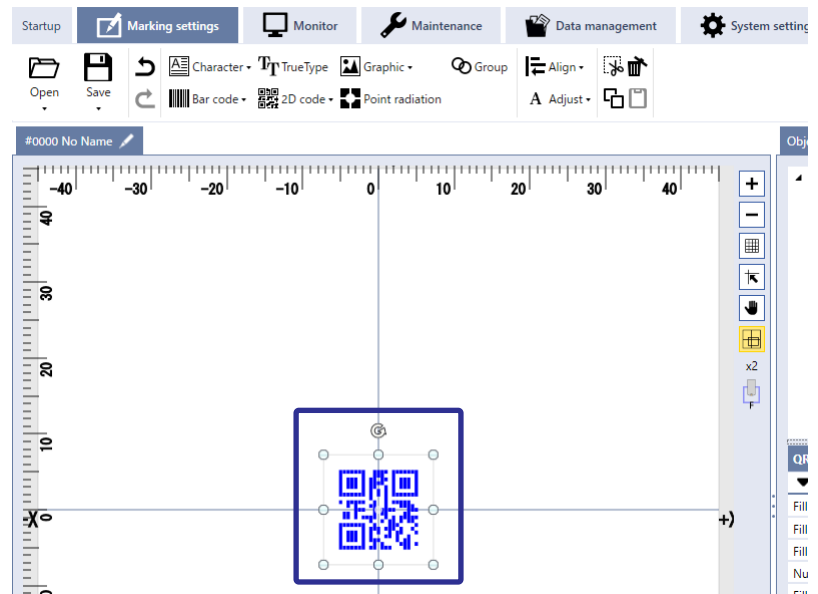
- For details of the QR code settings, refer to the “Laser Marker NAVI smart Operation Manual”.

7. Set the filling pattern parameters for QR Code.
- Filling pattern: Horizontal line
 - Filling width per module [mm]: 0.500
 - Filling height per module [mm]: 0.500

| QR Code/Micro QR Code/iQR Code | |
|---------------------------------------|-----------------|
| ▼ Module | |
| Filling pattern | Horizontal line |
| 7 Filling width per module [mm] | 0.500 |
| Filling height per module [mm] | 0.500 |
| Number of filling lines | 4 |
| Filling line spacing [mm] | 0.125 |
| Module marking direction (horizontal) | Left to right |
| Code marking direction | One direction |
| Module marking order | Skip none |
| ▶ Quiet zone outline | |
| ▶ Dark module | |
| ▶ Light module | |
| ▼ Position, rotation | |
| X-position [mm] | 0.000 |
| Y-position [mm] | 0.000 |
| Rotation angle [°] | 0.000 |
| ▼ Human readable text | |
| 8 Human readable text | OFF |

8. If you do not mark the human readable text, set as follows:
- Human readable text: OFF

9. Confirm that the QR code is displayed in the marking image editor.



10. If required, change the parameters in the 2D code object settings and laser settings.
Refer to “2-2 Create a marking file (offline mode)” (P.23).

11. Perform the test marking.
Refer to “2-8 Start laser radiation for marking” (P.32).

3-3 Mark a graphic

You can add graphic files created with AutoCAD or the Logo Data Editing software to use them in your marking file. The procedures to set a graphic are given below.

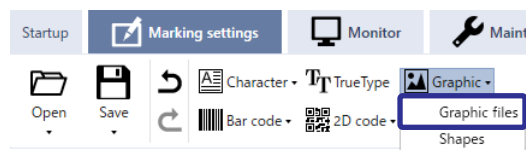
■ Example



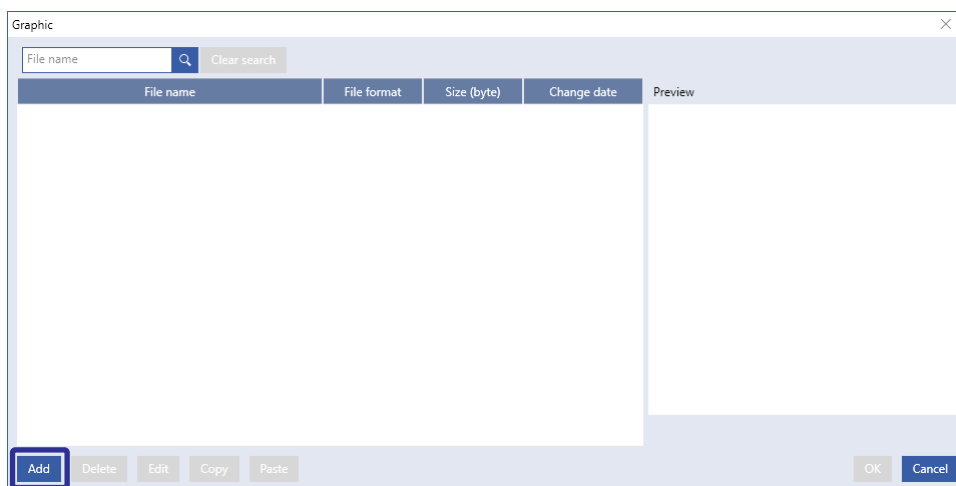
■ Setting procedures

1. In the “Marking settings” screen, select “Graphic” > “Graphic files” in the ribbon.

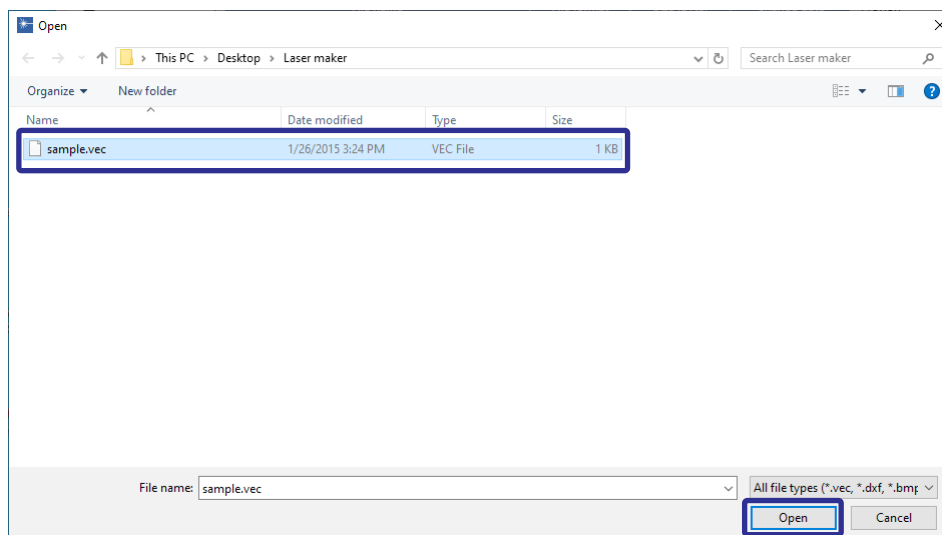
The “Graphic” dialog opens.



2. In the dialog, select “Add”.

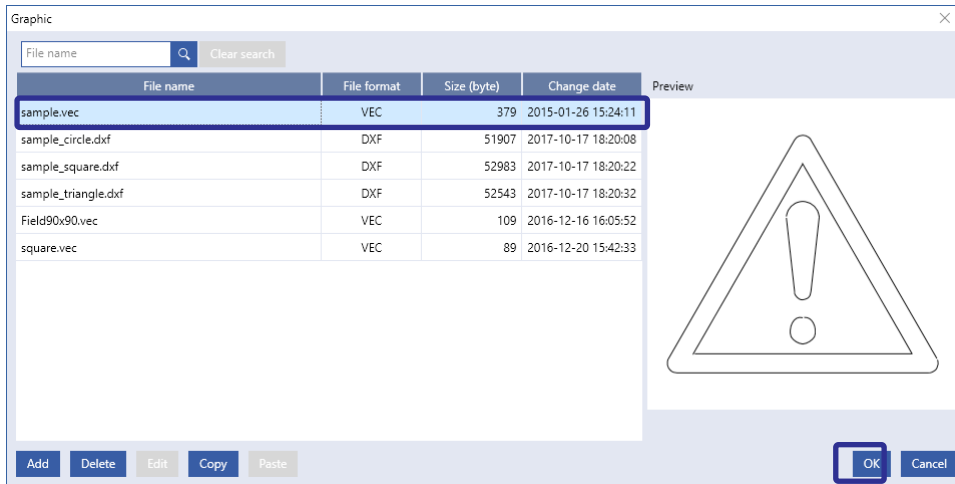


3. Choose a graphic file from your local or network drive and select “Open”.

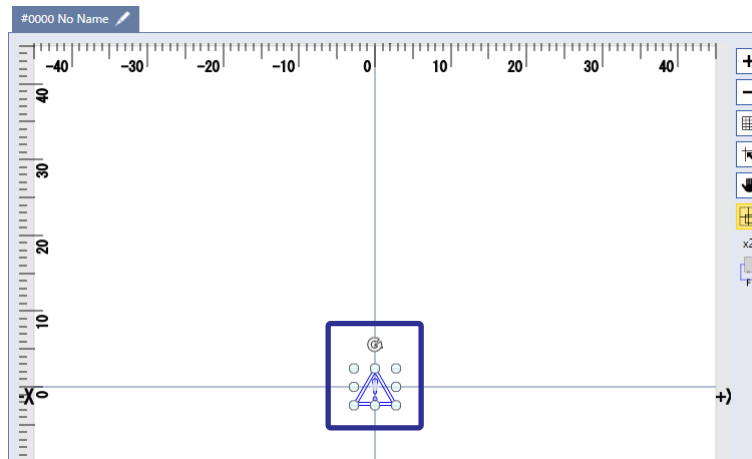


In this example, “sample.vec” is selected.

4. Select the graphic to be inserted into the marking file and confirm with "OK".



5. The graphic is added and displayed in the marking image editor.



6. If required, change the parameters in the graphic object settings and laser settings.

Refer to "2-2 Create a marking file (offline mode)" (P.23).

7. Perform the test marking.

Refer to "2-8 Start laser radiation for marking" (P.32).

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