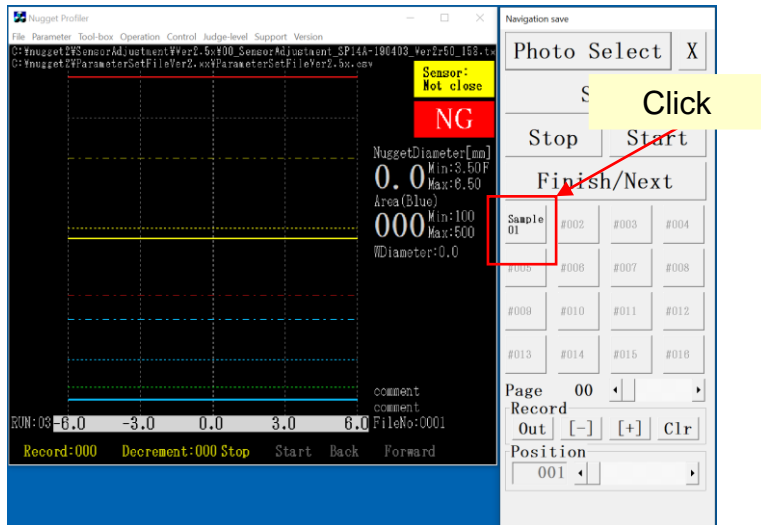


# Nugget Profiler Operation Manual

## Navigation Mode Settings

Created on June 3, 2019  
Revised on Feb 4, 2021

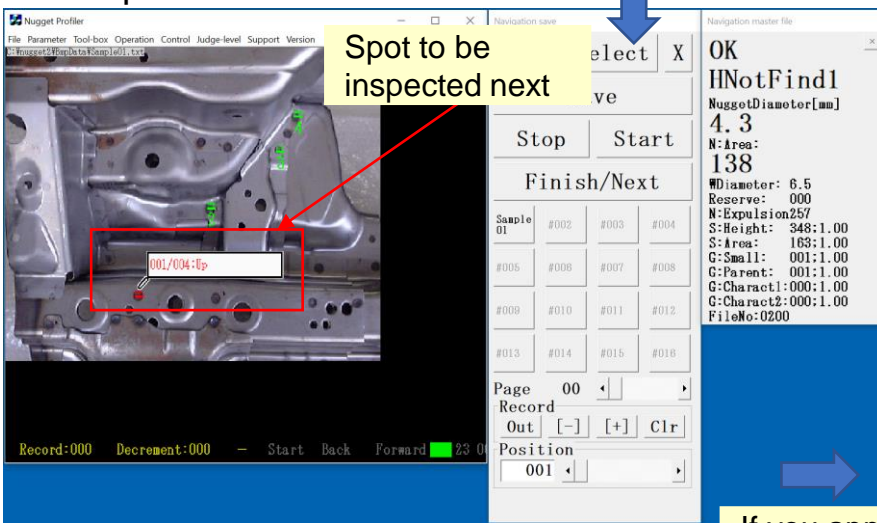
# What is the navigation mode?



Startup screen of NP

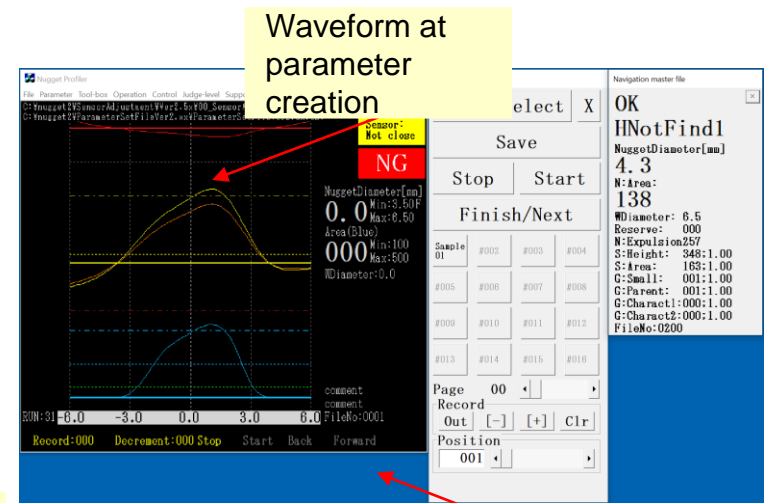
Starting [Nugget.exe], the inspection software for Nugget Profiler (NP), displays the inspection screen and the [Navigation Record] dialog box.

By clicking the button in the [Navigation Record] dialog box, you can display the photograph of the inspection object and specify the inspection spots. This mode is called the navigation mode.



Navigation mode screen of NP

If you apply the sensor to the inspection spot, the screen will change from the photograph to the inspection screen. Also, the waveform data, nugget diameter, and nugget area at parameter creation are displayed.



Inspection screen of NP

Switches over to the inspection screen

If you apply the sensor to the spot...

## Operation up to navigation mode setting

Step 0. Determine the folder name and file name

Step 1. Take a photograph and process it

Software to be used: Paint

Step 2. Register the inspection spots and parameter file to the photograph processed

Software to be used: BmplImage (inspection spot registration software)

Step 3. Set parameters for each inspection spot and record the inspection results to the photograph processed

Software to be used: Nugget (inspection software)

## Operation up to navigation mode setting

**Step 0. Determine the folder name and file name**

Step 1. Take a photograph and process it

Software to be used: Paint

Step 2. Register the inspection spots and parameter file to the photograph processed

Software to be used: BmImage (inspection spot registration software)

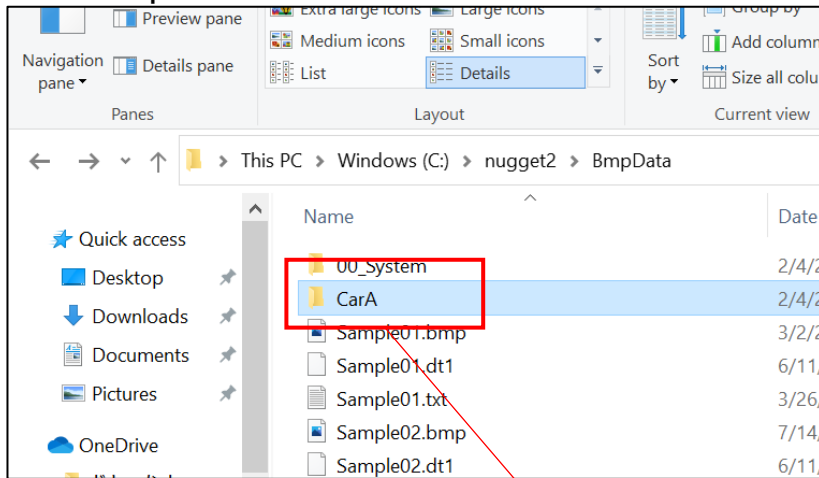
Step 3. Set parameters for each inspection spot and record the inspection results to the photograph processed

Software to be used: Nugget (inspection software)

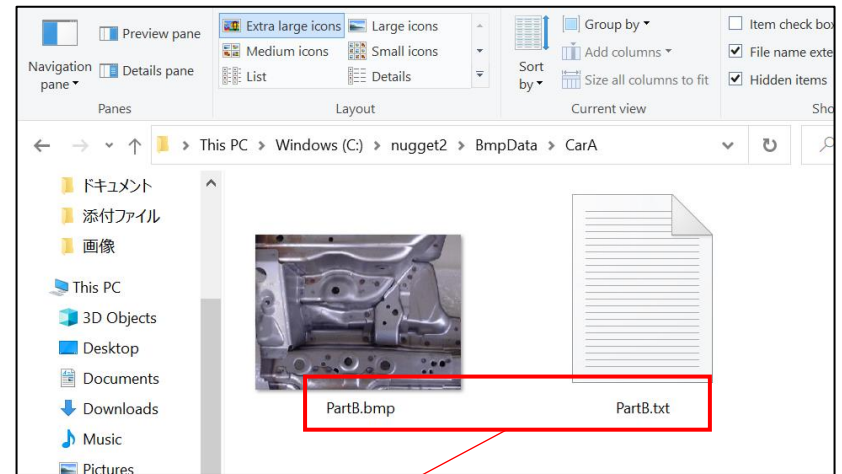
## Step 0. Determine the folder name and file name

After inspection in the navigation mode, the inspection data is output as shown below (in the Data folder).

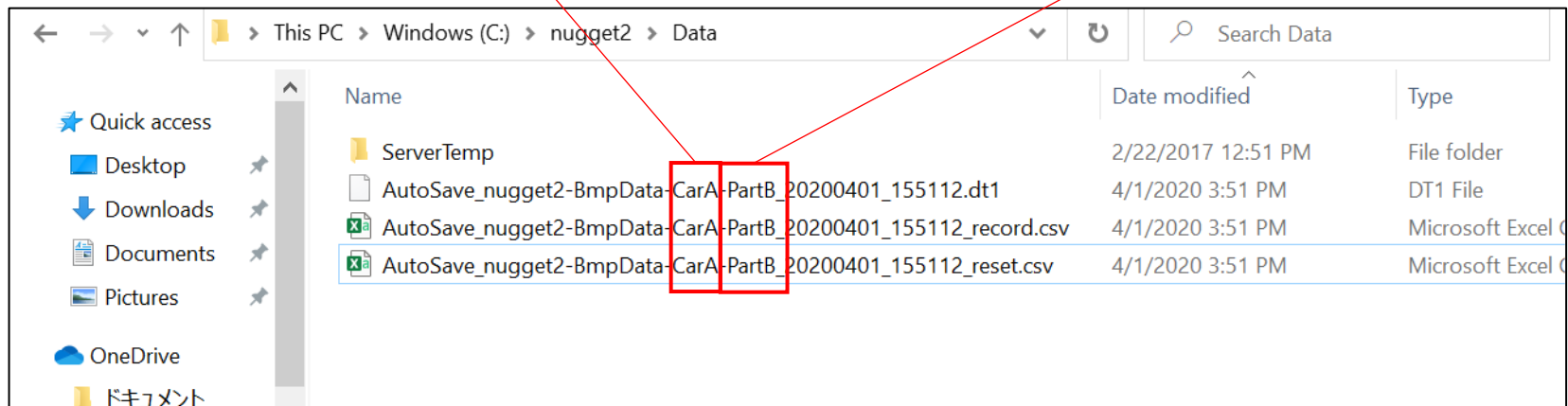
Name the folder and photograph created in the BmpData folder properly so that you can easily manage the inspection data.



In the BmpData folder

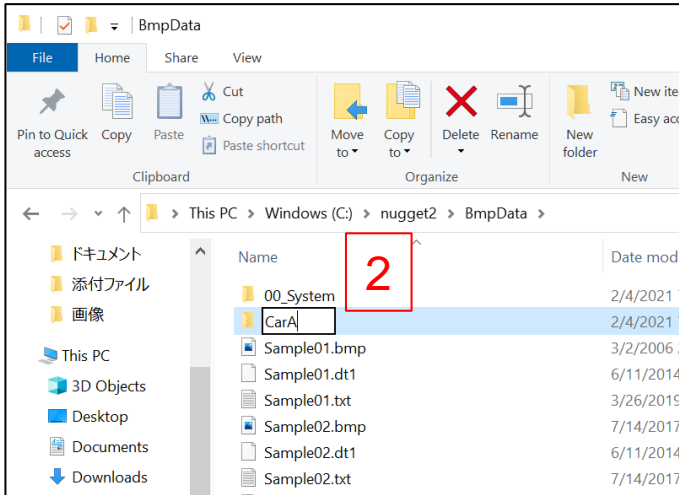


Dentro de la carpeta del nombre del producto (nombre del modelo del vehículo)



In the Data folder (where inspection data is output)

## Step 0-1. Create a new folder in the BmpData folder and rename it



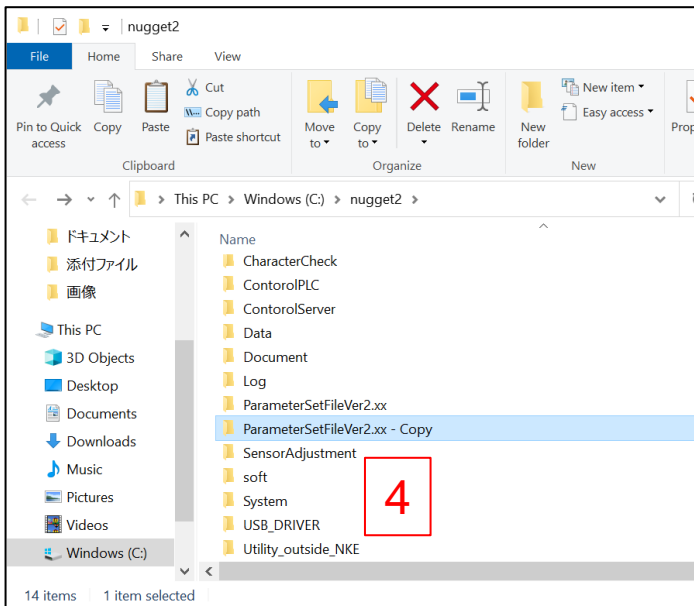
1. Click the [nugget2 - Shortcut] icon on the desktop to open the BmpData folder.

2. Create a new folder and rename it.

`C:¥nugget2¥BmpData`

Click this to open the BmpData folder.

## Step 0-2. Copy the parameter file folder and rename it



3. Click the [nugget2 - Shortcut] icon on the desktop to open the nugget2 folder.

4. Copy the [ParameterSetFileVer2.xx] folder as a whole.

5. Delete the characters after “ParameterSetFileVer2.xx,” enter an underscore “\_,” and enter the name.

# Supplement: What are parameters?

Parameters: Inspection environment factors (conditions such as the upper and lower limits of the inspection diameter and the sensor sensitivity) which are set for each inspection spot

The screenshot shows an Excel spreadsheet titled "ParameterSetFileVer2.5x.csv". The table has columns A through X. Row 1 is labeled "Parameter" and contains the value "2.51". Row 2 is highlighted with a red border and contains a long string of parameter names: "パラメータ番号コメント1(全角コメント2(全角ホールド値AS:設定\_@AS:判定\_@AS:判定\_@AS:設定\_@AS:判定\_@AS:判定\_@AS:判定\_@AS:判定\_@AS:設定\_@AS:設定\_@AS:磁界設 AS:磁界設 AS:磁界設 解析結果道 PLC出力値 PLCタイム 表示言語( デバイスタセンサータ制御(行". Rows 3 through 36 contain numerical values for these parameters, with many cells containing "0".

One row describes a set of parameters. Basically, parameters should be specified for respective spots.

## Operation up to navigation mode setting

Step 0. Determine the folder name and file name

**Step 1. Take a photograph and process it**

Software to be used: Paint

Step 2. Register the inspection spots and parameter file to the photograph processed

Software to be used: BmpImage (inspection spot registration software)

Step 3. Set parameters for each inspection spot and record the inspection results to the photograph processed

Software to be used: Nugget (inspection software)



## Step 1. Take a photograph and process it

NP reads image files of “**640 x 480 pixels or less**” in the “**24-bit bitmap**” format.

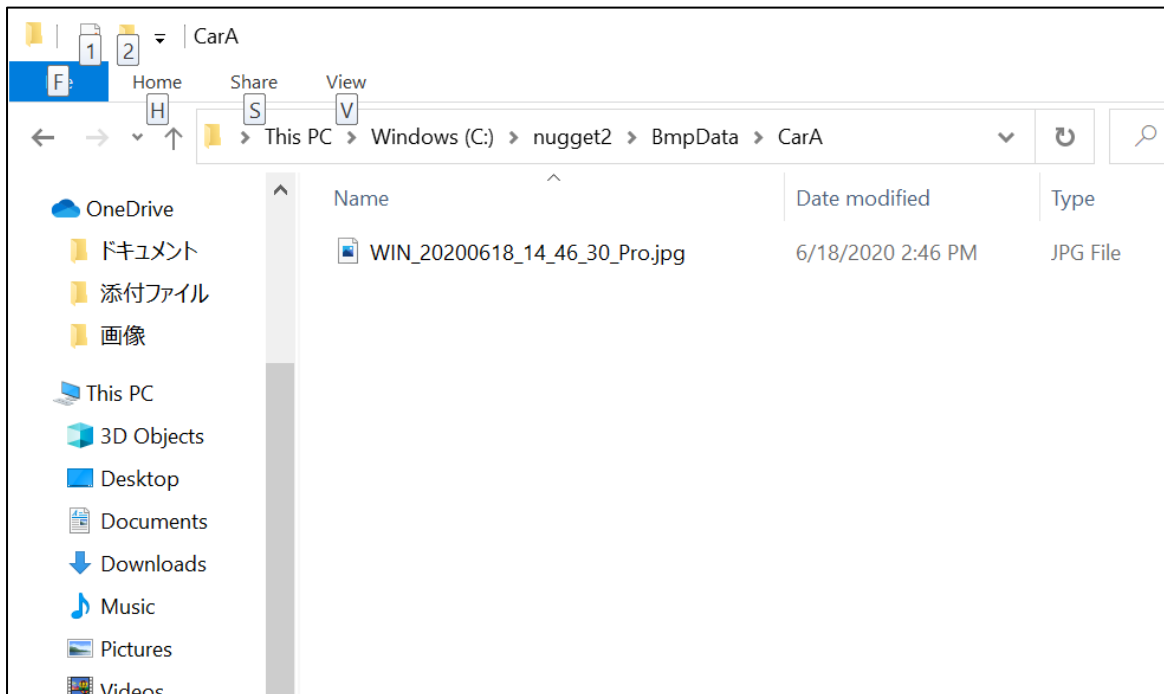
Therefore, JPEG images taken with digital cameras or the like need to be processed.

On the other hand, as long as files are of “640 x 480 pixels or less” and in the “24-color bitmap” format, images other than photographs, such as drawings, can be registered.

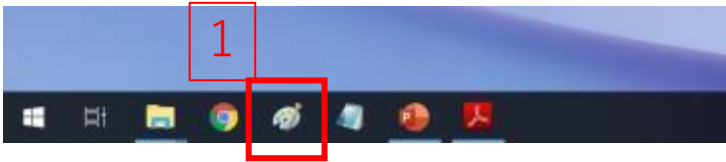
\* This section describes the operation procedure using a tablet PC, but there is no problem even if you use your own PC to process images.

### Step 1-1. Take a photograph and save it in the BmpData folder

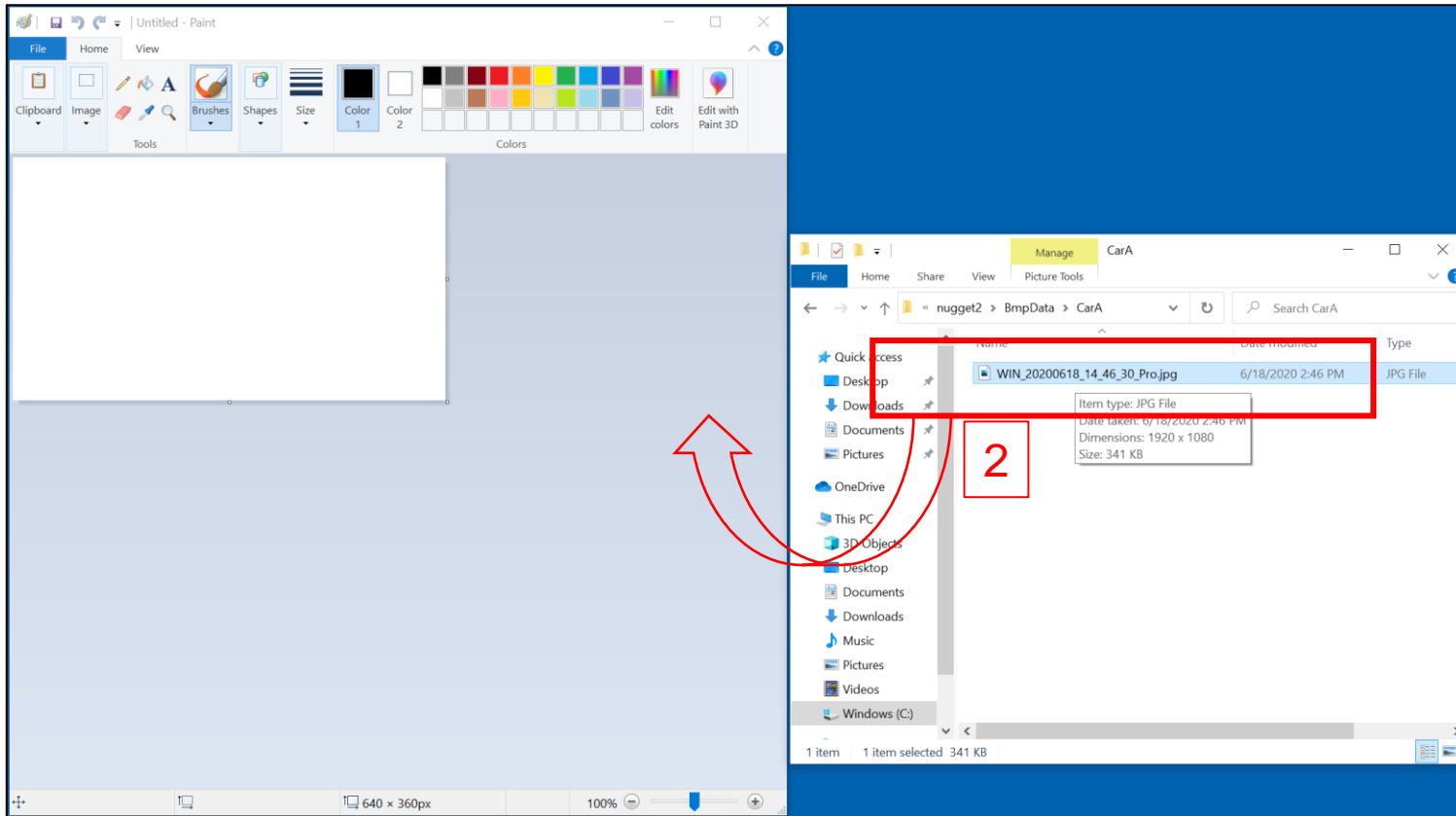
Move the photograph taken with a digital camera into the BmpData folder created in step 0.



## Step 1-2. Open the photograph in Paint

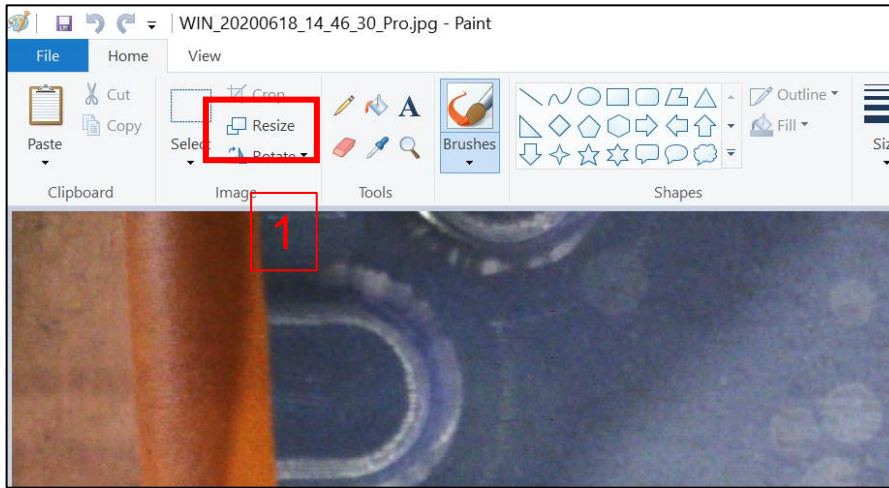


1. Open Paint from the taskbar at the bottom of the desktop.

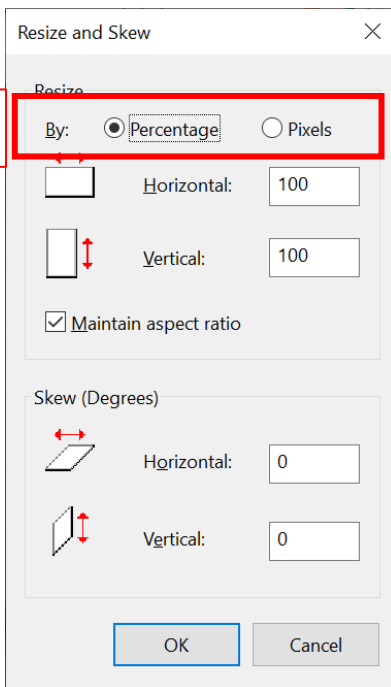


2. Drag and drop the photograph saved in the BmpData folder onto the Paint window.

## Step 1-3. Resize the photograph



1. Click [Image] on the toolbar, then [Resize].

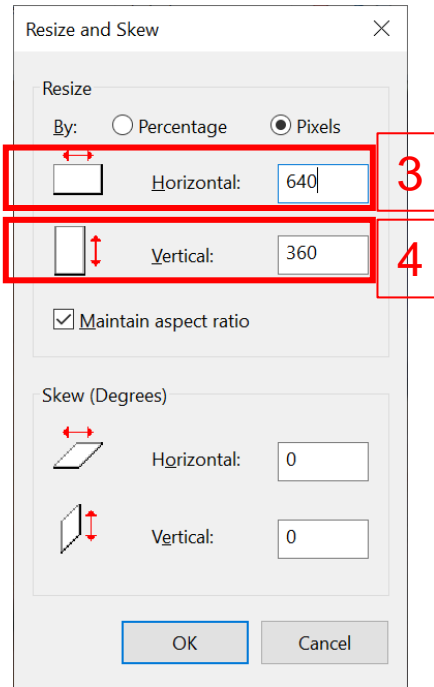


2. Select [Pixel] for the unit.

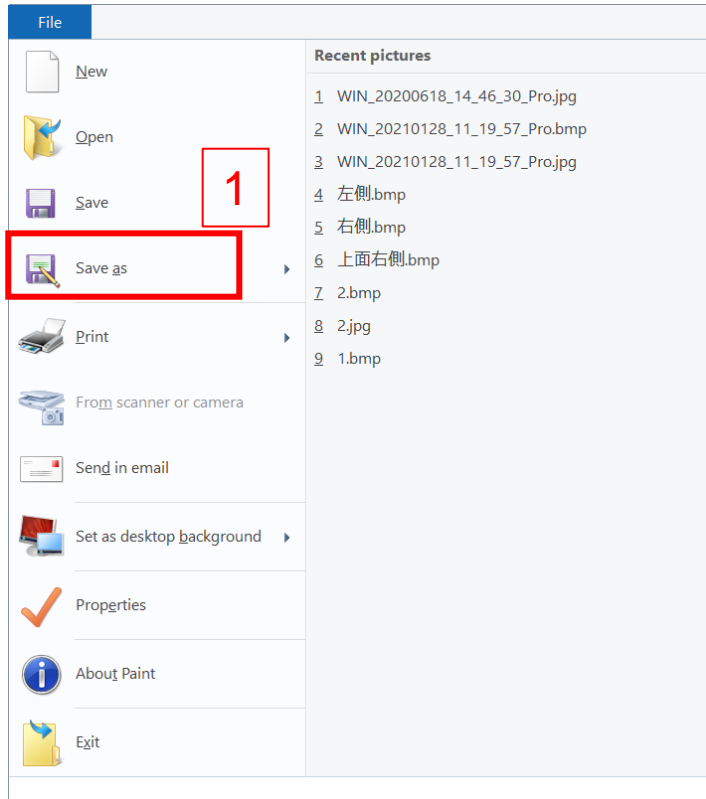
3. Set the horizontal size to 640 pixels or less.

4. Set the vertical size to 480 pixels or less.

\* You do not necessarily have to keep the aspect ratio.



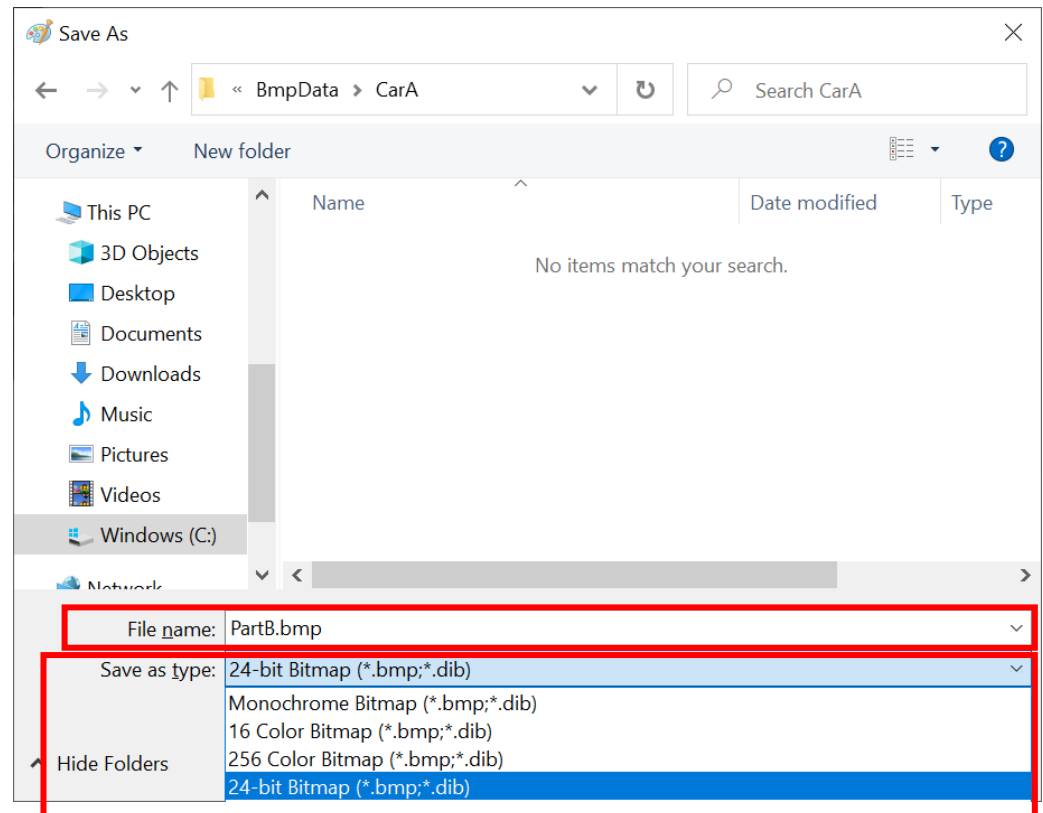
## Step 1-3. Save as a new file



1. Click [File] on the toolbar, then [Save As (A)].

2. Rename the file as decided in step 0.

3. Select [24-Bit Bitmap] for [Save as type] and save the file.



## Operation up to navigation mode setting

Step 0. Determine the folder name and file name

Step 1. Take a photograph and process it

Software to be used: Paint

**Step 2. Register the inspection spots and parameter file to the photograph processed**

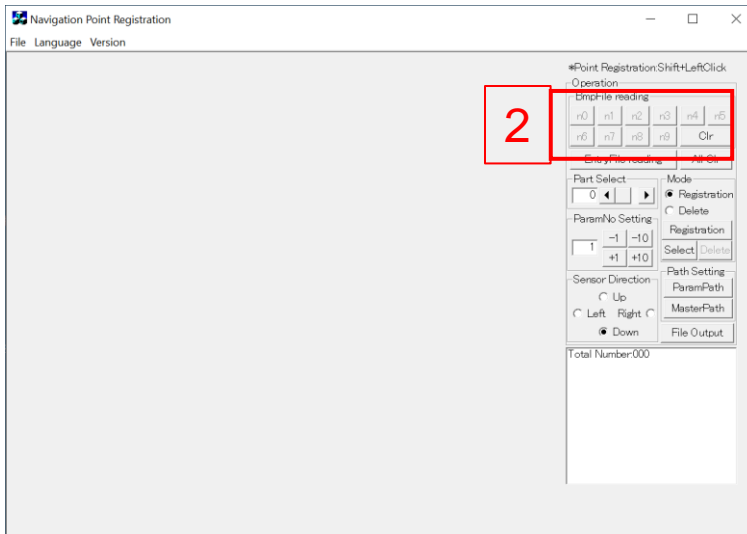
Software to be used: BmplImage (inspection spot registration software)

Step 3. Set parameters for each inspection spot and record the inspection results to the photograph processed

Software to be used: Nugget (inspection software)

## Step 2. Register the inspection spots and parameter file to the photograph process

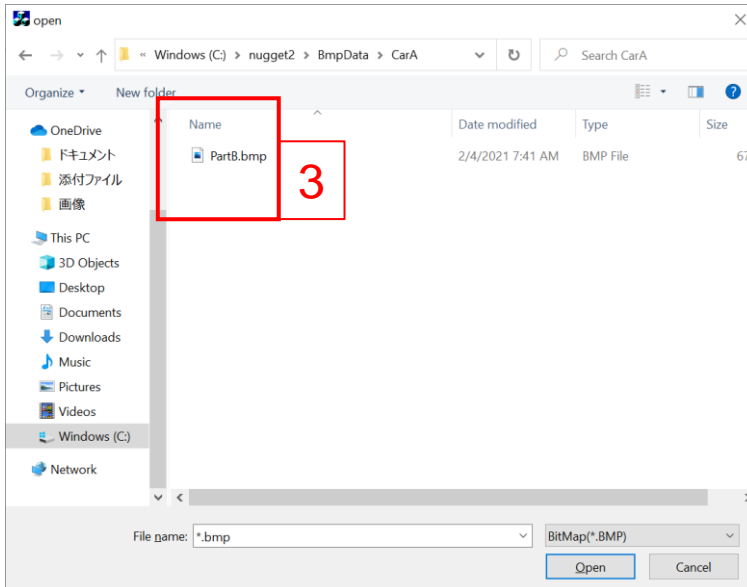
### Step 2-1. Register the inspection spots to the photograph processed



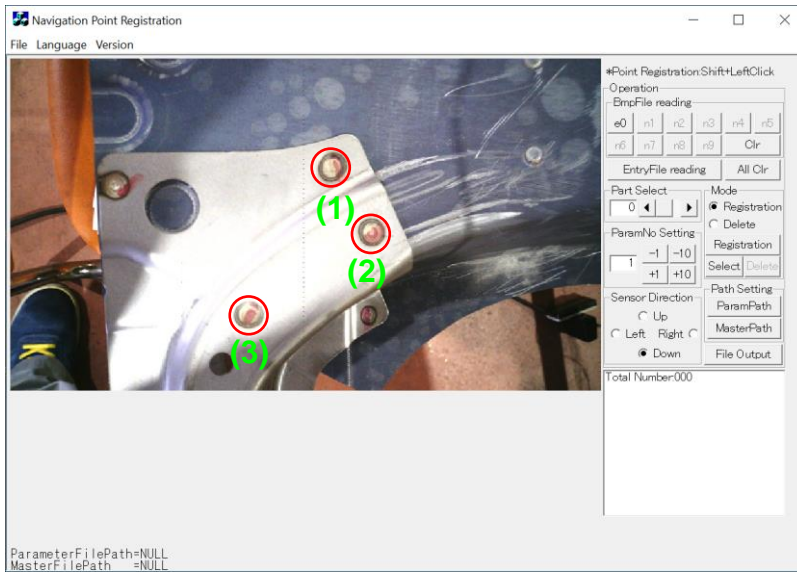
1. Click the [BmpImage.exe - Shortcut] icon on the desktop to start the inspection spot registration software.

2. Click [n0] to read BMP files.

3. Select and open the BMP file created in step 1.



## Step 2-1. Register the inspection spots to the photograph processed (continued)

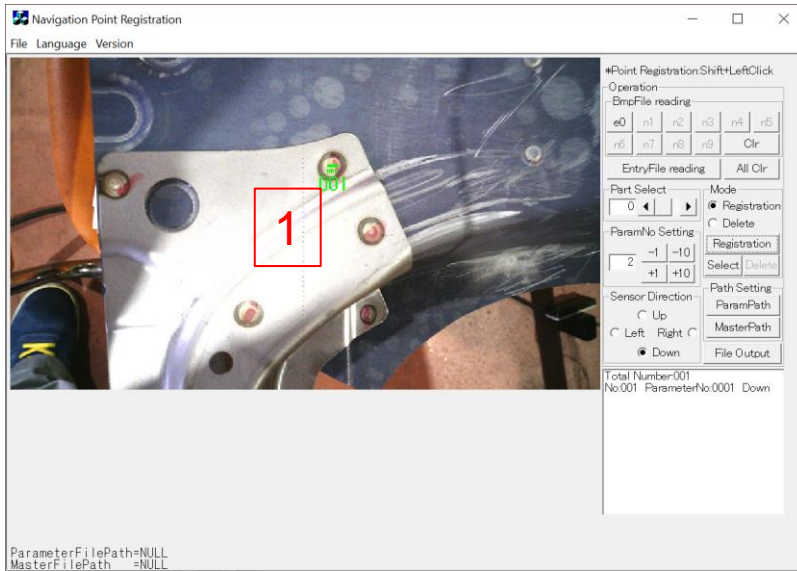


This section describes how to register the three inspection spots enclosed by the red circles, as an example.

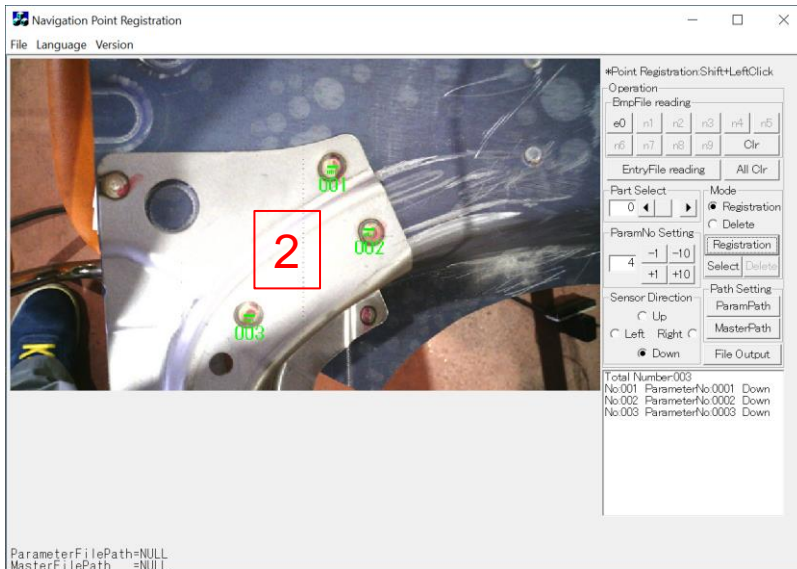


1. Move the pointer onto the first inspection spot and left-click the mouse while pressing the shift key.
  - \* You can change the inspection spot by left-clicking the mouse while pressing the shift key.

## Step 2-1. Register the inspection spots to the photograph processed (continued)



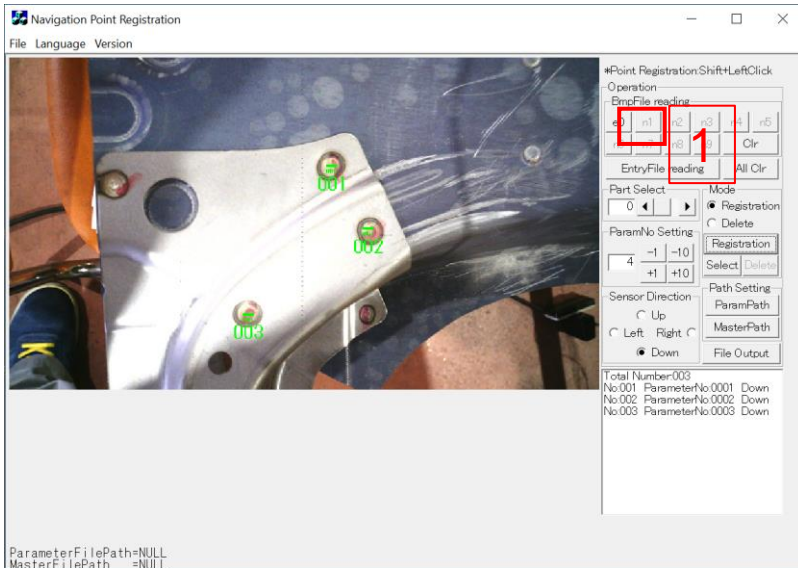
1. Once the inspection spot is determined, click the [Register] button. Then the inspection mark will change from blue to green.



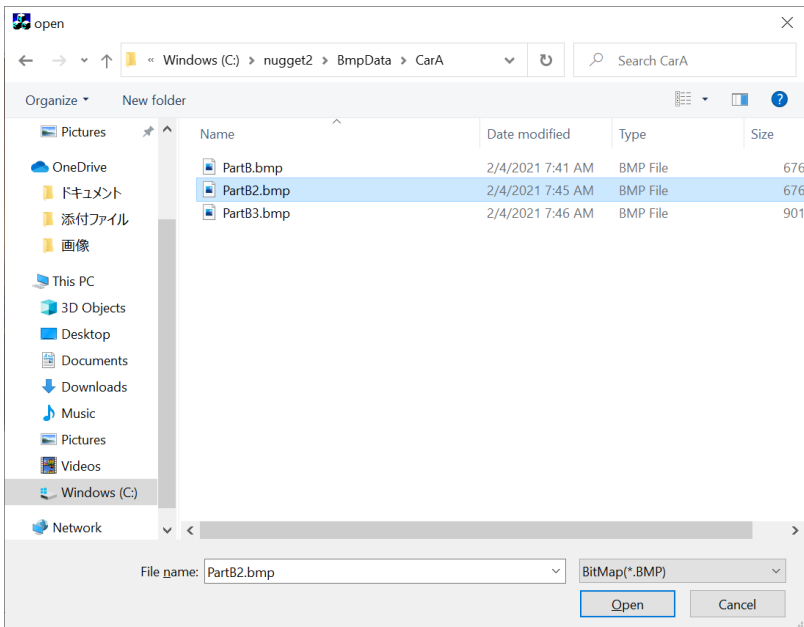
2. Register the second and third inspection spots in the same way.



## Step 2-2. Register multiple photographs

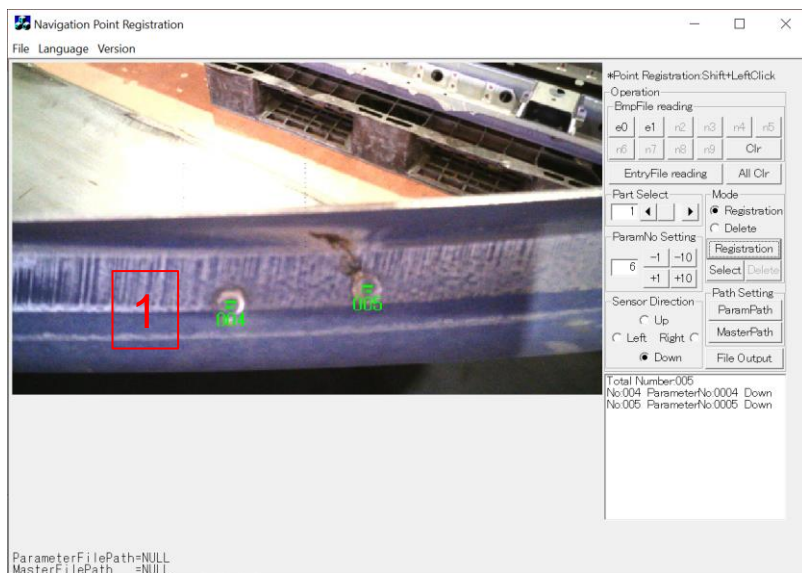


1. After the inspection spots are registered in the first photograph, click [n1] to select the next photograph to be registered.



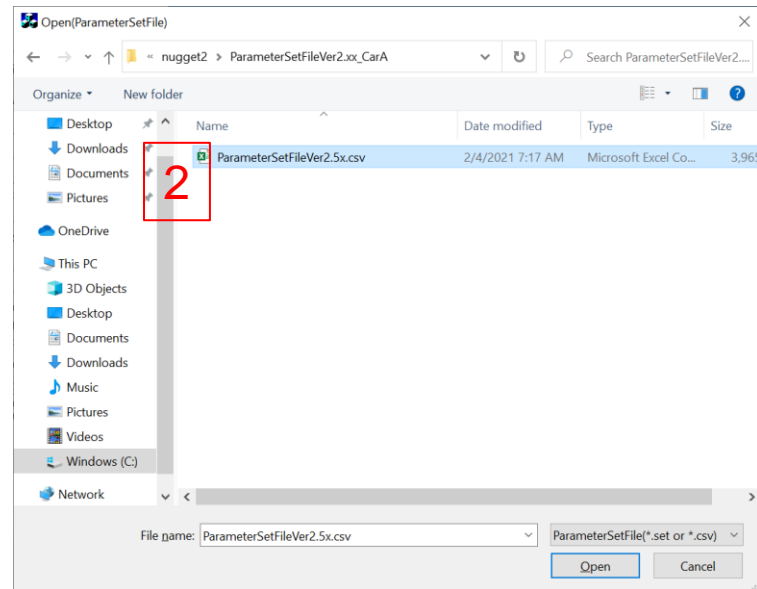
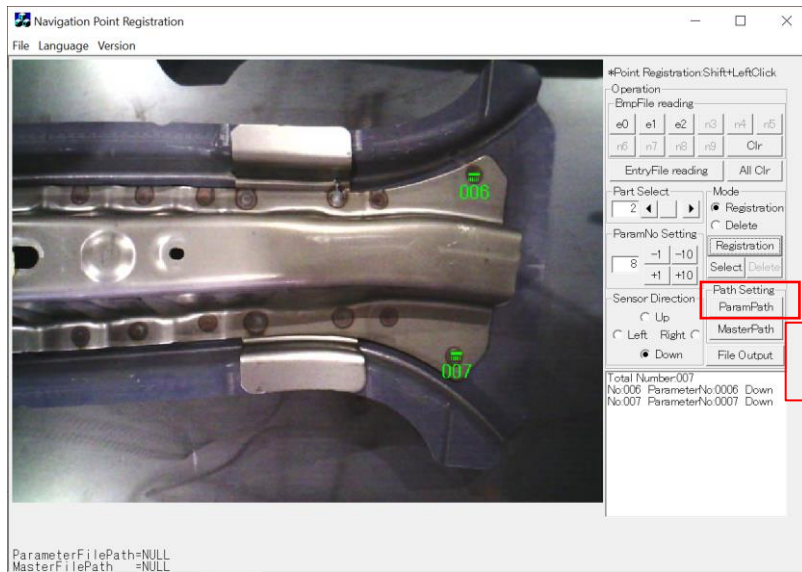
## Step 2-3. Register inspection spots to multiple photographs

1. Register inspection spots as in step 2-1.



## Step 2-4. Link the parameter file

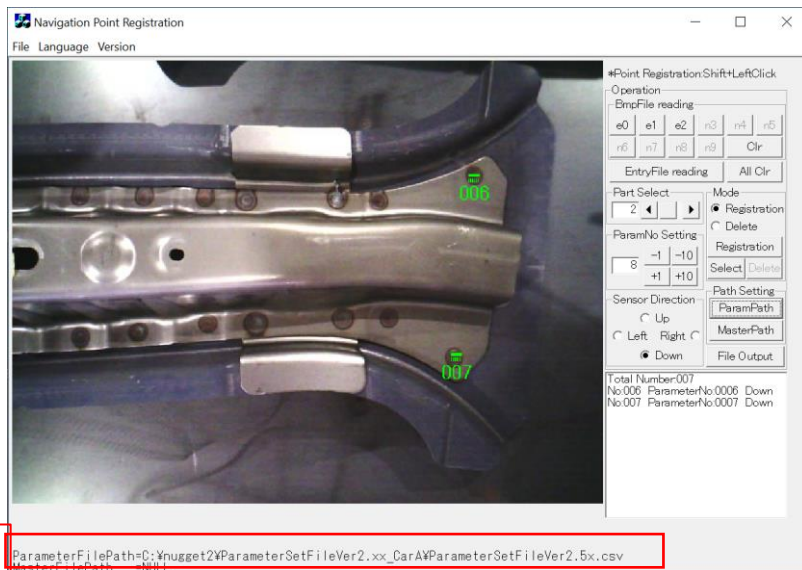
After the photographs and inspection spots are registered, link the parameter file.



1. Click [Param Path].

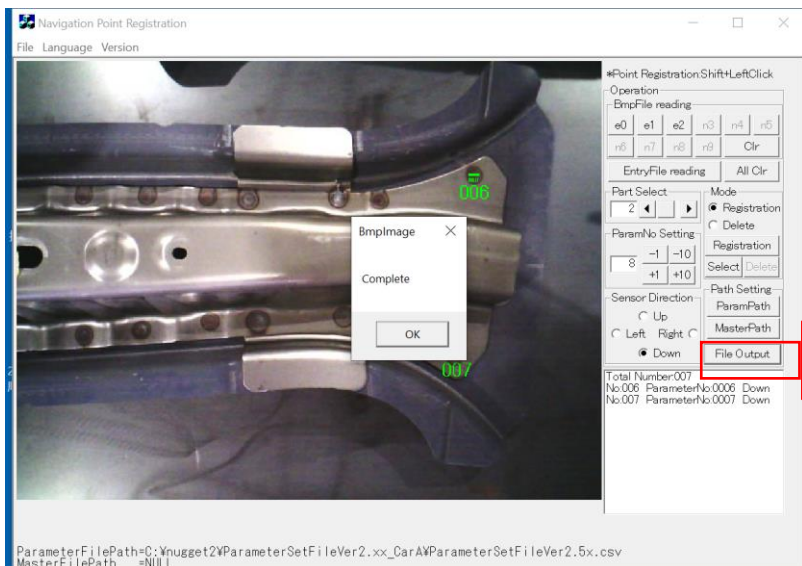
2. Select the parameter file created in step 0.

3. Confirm that [ParameterFilePath] in the bottom of the screen has changed from NULL to the parameter file you selected.



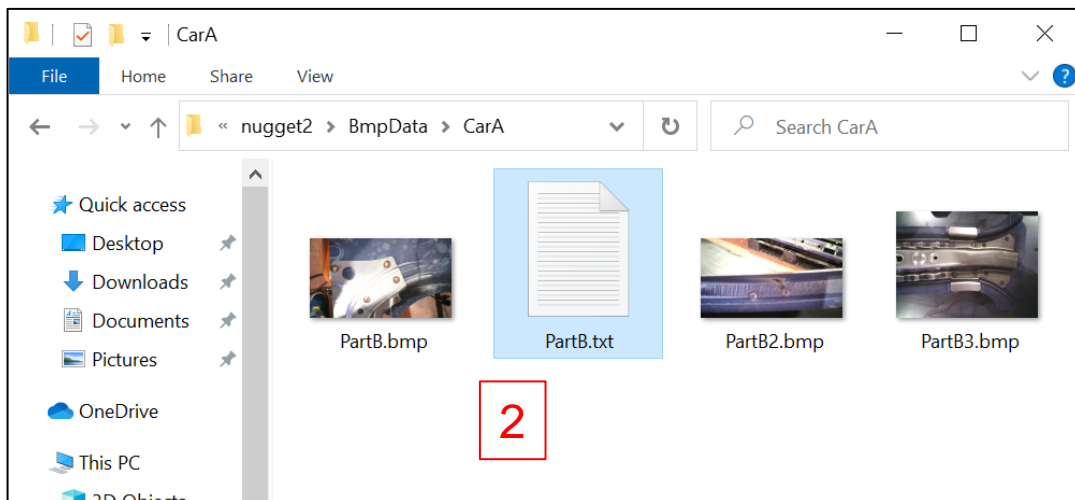
3

## Step 2-4. Link the parameter file

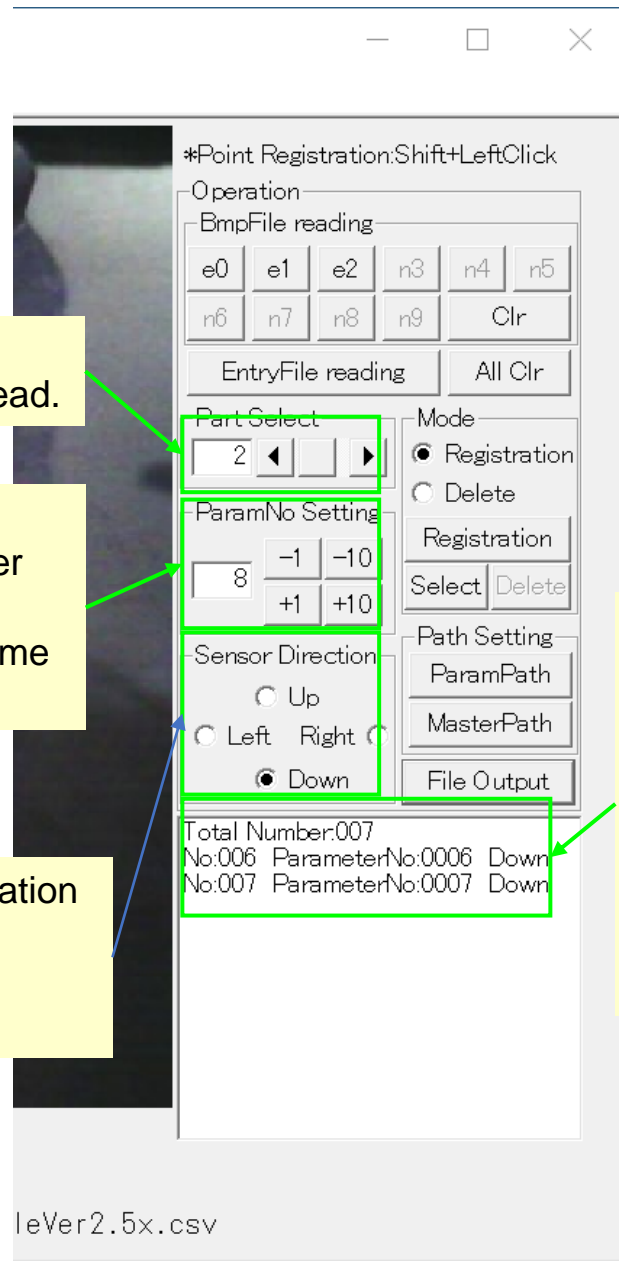


1. Click [File Output].

2. Then a text file will be created in the BmpData folder.



## Step 2-Supplement. Inspection spot registration software



You can select the BMP file from among the files already read.

You can designate which row of the parameter file is to be used to register the next spot.  
This automatically counts up every time an inspection spot is registered.

You can change the orientation of the sensor.  
You can also change it when setting parameters.

Shows the number of registered inspection spots and which row of the parameter file is to be used to register each spot.

\* If you register multiple photographs, in particular, make sure that the parameter numbers do not overlap.

## Operation up to navigation mode setting

Step 0. Determine the folder name and file name

Step 1. Take a photograph and process it

Software to be used: Paint

Step 2. Register the inspection spots and parameter file to the photograph processed

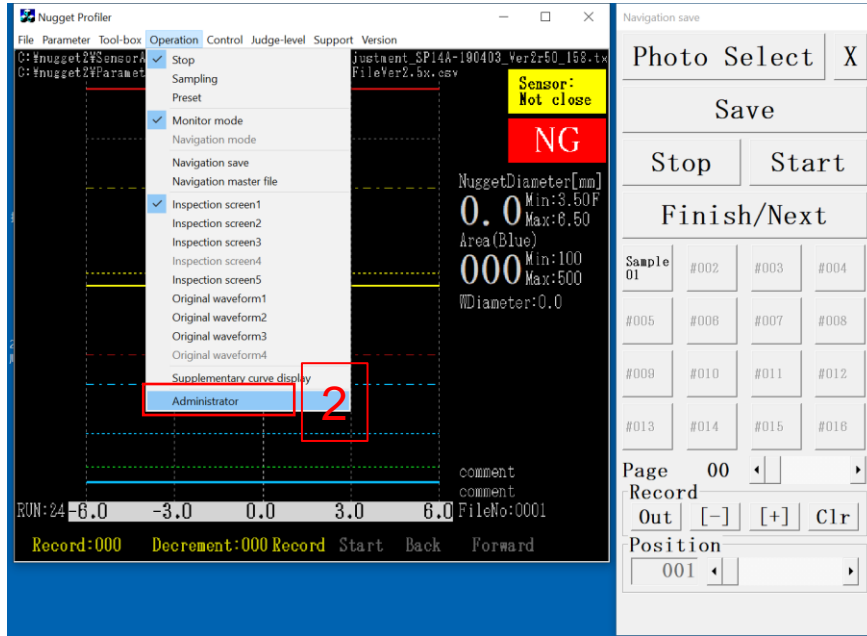
Software to be used: BmplImage (inspection spot registration software)

**Step 3. Set parameters for each inspection spot and record the inspection results to the photograph processed**

Software to be used: Nugget (inspection software)

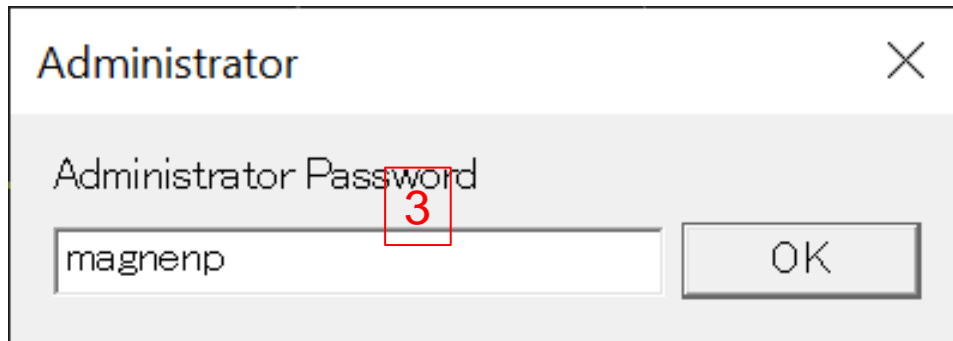
## Step 3. Set parameters for each inspection spot and record the inspection results

### Step 3-1. Set parameters for the inspection spots created in step 2



1. Click the [Nugget.exe - Shortcut] icon on the desktop to start the inspection software.
2. Click [Operation], then [Administrator].
3. Enter the password.

Password: magnenp

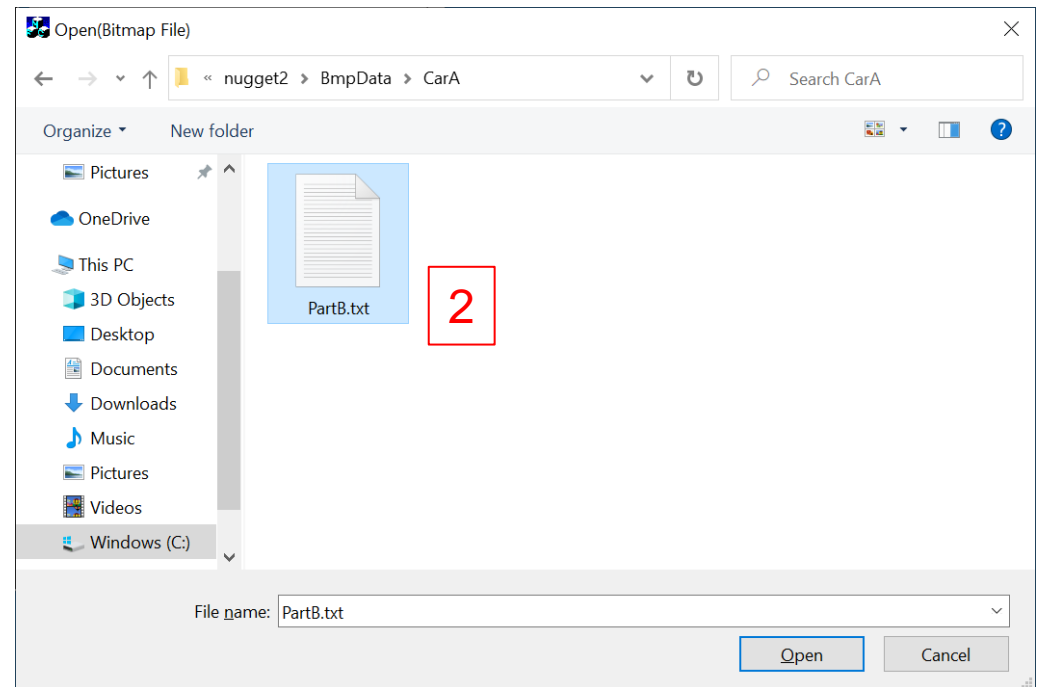




## Step 3-1. Register the photograph to the button in the [Navigation Record] dialog

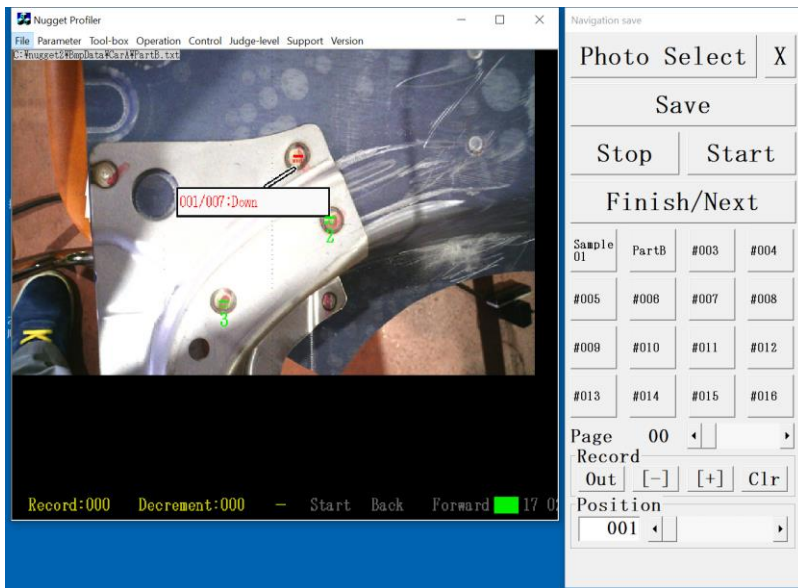


1. Click any button in the [Navigation Record] dialog box.
  - \* The photograph and inspection spots will be registered to the button you clicked.
2. Select the text file created in step 2.





## Step 3-2. Set parameters for inspection spots

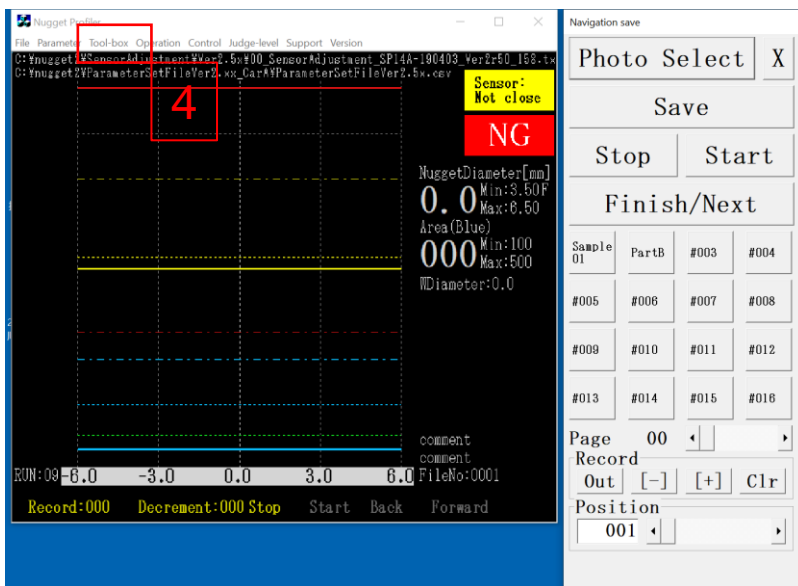


1. The screen changes to the first photograph registered in step 2.

2. If you apply the sensor to the designated inspection spot, the screen will change to the inspection screen.

3. Remove the sensor from the inspection spot.

4. Click [Toolbox].



## Step 3-2. Set parameters for inspection spots (continued)

The screenshot shows the 'Point initialization' dialog box with the following sections and settings:

- 1** (Title bar): Point initialization
- 2** (Steel kind setting):
  - Level:Weld:  Standred,  Higher,  Lower
  - Level:Setting:  Standred,  Severe,  Rough
  - Steel kind setting:
    - <=ver2.23,  Customized1
    - <500MPa,  Customized2
    - >500MPa,  Customized3
  - Flat electrode,  Yellow\_W
  - Invalid:center,  SideRange
- 3** (Sensor direction setting):
  - Left,  Upward,  Right
  - Downward
- 4** (Analysis setting):
  - Auto setting: Diam:Specified 4.5
  - Manual setting:
    - Effect
    - Sensitivity: 28.00
    - Coefficient:W: 0.90
    - Diam:Threshok: 10.0
    - Diam:Gain: 1.00
- 5** (Judgement setting):
  - Thickness: EXEC, 3.50 - 6.50
  - Judge: OK/NG[%]: 75.0 - 150.0
  - Correction: Inspection[%]: 80.0 - 120.0
  - EXEC buttons
- Comment1(14char): comment
- Comment2(14char): comment
- Reference
- Parameter save

1. Click [Initialize Inspection Spots].

2. Select the steel grade.

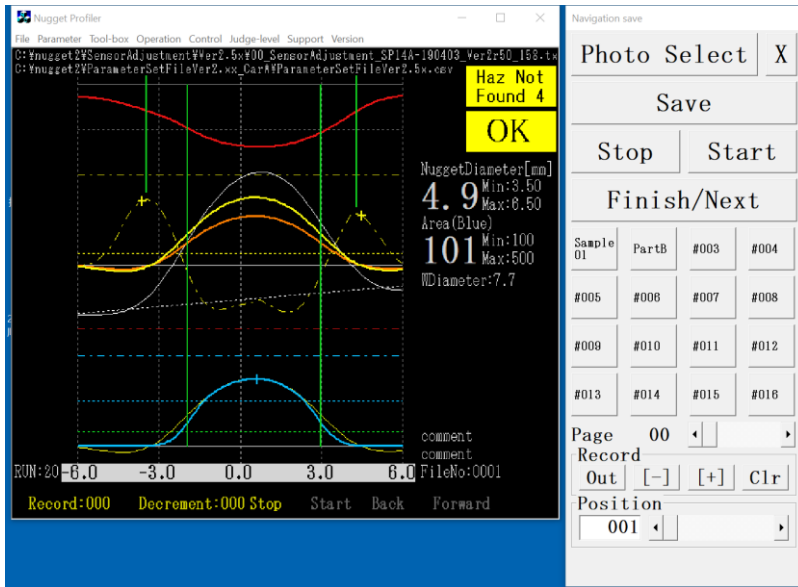
3. Designate in which orientation the sensor is to be applied to the inspection spot.

\* You can decide it for your ease of use.

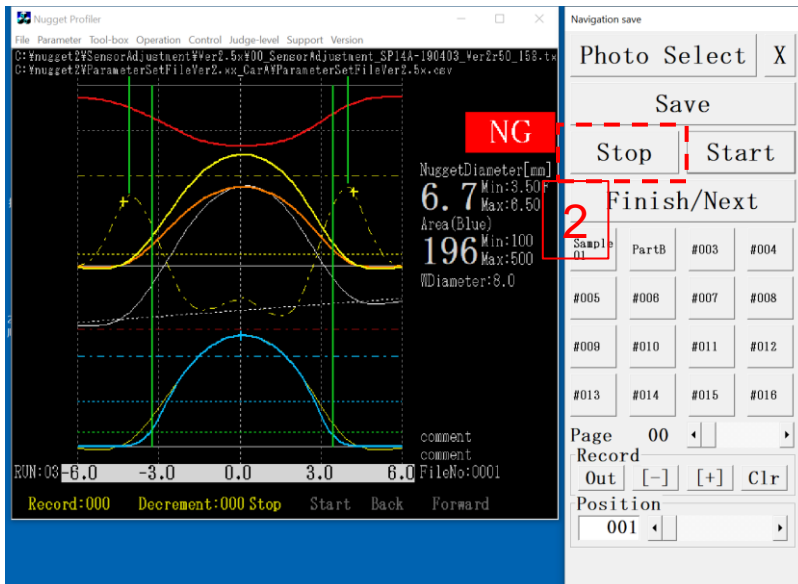
4. Enter the standard fracture diameter.

5. Enter the upper and lower limits of the nugget diameter.

## Step 3-2. Set parameters for inspection spots (continued)



1. Apply the sensor to the inspection spot.



2. Stop the waveform at the position where the nugget diameter and area (waveform) become the largest.

How to stop the waveform

- Press the hand switch.
  - Click [Stop] in the [Navigation Record] dialog box (by using the mouse, or touch the button on the screen with a stylus or finger).
  - Press the switch on the back of the main unit.
- \* For the 7-inch toughpad specification shipped in April 2019

## Step 3-2. Set parameters for inspection spots (continued)

Nugget Profiler  
File: Parameter Tool-box Operation Control Judge-level Support Version  
C:\Nugget2\SensorAdjustment\Ver2.5x#00\_SensorAdjustment\_SP14A-190403\_Ver2.50\_158.tx  
C:\Nugget2\ParameterSetFile\Ver2.5x\_Dar\ParameterSetFile\Ver2.5x.csv

NG  
NuggetDiameter[mm]  
6.7 Min:3.50F  
Area(Blue)  
196 Min:100  
Max:500  
WDiameter:8.0  
comment  
comment  
FileNo:0001  
RUN:03-6.0 -3.0 0.0 3.0 6.0  
Record:000 Decrement:000 Stop Start Back Forward

Navigation save  
Photo Select X  
Save  
Stop Start  
Finish/Next  
Sample PartB #003 #004  
#005 #006 #007 #008  
#009 #010 #011 #012  
#013 #014 #015 #016  
Page 00  
Record  
Out [-] [+] Clr  
Position  
001

Tool box  
SelectSettingfile Read BeforePointSetting Point initialization X  
LevelWeld Level Setting Steel kind setting  
Level Setting: Standed Standed <Ver2.23 Customize1  
Higher Severe <500MPa Customize2  
Lower Rough >500MPa Customize3  
Sensor direction setting: Flat electrode Yellow,W  
Invalid center SideRange  
Magnetic field Setting: Invalid center SideRange  
Judgement setting: Diameter  
Surface t[mm]Specified: 000  
Thickness EXEC  
< > 350 - 650  
-Judge: OK/NG[%]  
< > 75.0 - 150.0  
Correction: Inspection[N]  
< > 80.0 - 120.0  
EXEC  
Manual setting: EXEC  
Effect  
Sensitivity: 2800  
Coefficient W: 0.90  
Diam.Threshold: 10.0  
Diam.Gain: 1.00  
Comment(1:4char) comment  
Comment2(1:4char) comment  
Reference Parameter save

1. Click [EXEC] for [Analysis Settings] in the [Toolbox] dialog box.

Nugget Profiler  
File: Parameter Tool-box Operation Control Judge-level Support Version  
C:\Nugget2\SensorAdjustment\Ver2.5x#00\_SensorAdjustment\_SP14A-190403\_Ver2.50\_158.tx  
C:\Nugget2\ParameterSetFile\Ver2.5x\_Dar\ParameterSetFile\Ver2.5x.csv

OK  
Nugget  
Complete  
OK  
NuggetDiameter[mm]  
4.5 Min:3.50  
Area(Blue)  
164 Min:100  
Max:500  
WDiameter:5.0  
comment  
comment  
FileNo:0001  
RUN:27-4.3 -2.1 0.0 2.1 4.3  
Record:000 Decrement:000 Record Start Back Forward

Navigation save  
Photo Select X  
Save  
Stop Start  
Finish/Next  
Sample PartB #003 #004  
#005 #006 #007 #008  
#009 #010 #011 #012  
#013 #014 #015 #016  
Page 00  
Record  
Out [-] [+] Clr  
Position  
001

Tool box  
SelectSettingfile Read BeforePointSetting Point initialization X  
LevelWeld Level Setting Steel kind setting  
Level Setting: Standed Standed <Ver2.23 Customize1  
Higher Severe <500MPa Customize2  
Lower Rough >500MPa Customize3  
Sensor direction setting: Flat electrode Yellow,W  
Invalid center SideRange  
Magnetic field Setting: Invalid center SideRange  
Judgement setting: Diameter  
Surface t[mm]Specified: 000  
Thickness EXEC  
< > 350 - 650  
-Judge: OK/NG[%]  
< > 75.0 - 150.0  
Correction: Inspection[N]  
< > 80.0 - 120.0  
EXEC  
Manual setting: EXEC  
Effect  
Sensitivity: 26.75  
Coefficient W: 0.97  
Diam.Threshold: 10.0  
Diam.Gain: 0.70  
Comment(1:4char) comment  
Comment2(1:4char) comment  
Reference Parameter save

2. The inspected nugget diameter (waveform) will be set to 4.5 mm.

## Step 3-2. Set parameters for inspection spots (continued)

The screenshot shows the Nugget Profiler interface. On the left, a graph displays inspection results with a red 'OK' box. The graph shows a blue curve for 'Area (Blue)' and a red curve for 'Nugget Diameter [mm]'. The 'Nugget Diameter [mm]' is 4.5, with a minimum of 3.50 and a maximum of 6.50. The 'Area (Blue)' is 164, with a minimum of 100 and a maximum of 500. The 'WDiameter' is 5.7. The graph also shows 'Record:000', 'Decrement:000', and 'Record Start Back Forward' buttons. On the right, the 'Tool box' panel is open, showing various settings. A red box highlights the 'EXEC' button in the 'Judgment setting' section, with a red '1' next to it. The 'Analysis setting' section shows 'Diam Specified' set to 45.

**1. Click [EXEC] for [Analysis Settings] in the [Judgment Settings] pane.**

1. Click [EXEC] for [Analysis Settings] in the [Judgment Settings] pane.

The screenshot shows the Nugget Profiler interface. On the left, a graph displays inspection results with a red 'OK' box. The graph shows a blue curve for 'Area (Blue)' and a red curve for 'Nugget Diameter [mm]'. The 'Nugget Diameter [mm]' is 4.5, with a minimum of 4.00 and a maximum of 8.90. The 'Area (Blue)' is 164, with a minimum of 123 and a maximum of 248. The 'WDiameter' is 5.7. The graph also shows 'Record:000', 'Decrement:000', and 'Record Start Back Forward' buttons. On the right, the 'Tool box' panel is open, showing various settings. A red box highlights the 'EXEC' button in the 'Judgment setting' section, with a red '2' next to it. The 'Analysis setting' section shows 'Diam Specified' set to 45.

**2. The upper and lower limits will be set.**

2. The upper and lower limits will be set.

## Step 3-2. Set parameters for inspection spots (continued)

The screenshot displays the Nugget Profiler software interface. On the left, a graph shows inspection results with a red curve at the top and a blue curve at the bottom. A green 'OK' button is visible in the top right of the graph area. Below the graph, a 'Nugget' dialog box is open, showing 'Complete' and an 'OK' button. To the right of the graph, the following data is displayed:

NuggetDiameter[mm]	4.5	Min:4.00	Max:9.90
Area(Blue)	164	Min:123	Max:246
WDiameter	5.7		

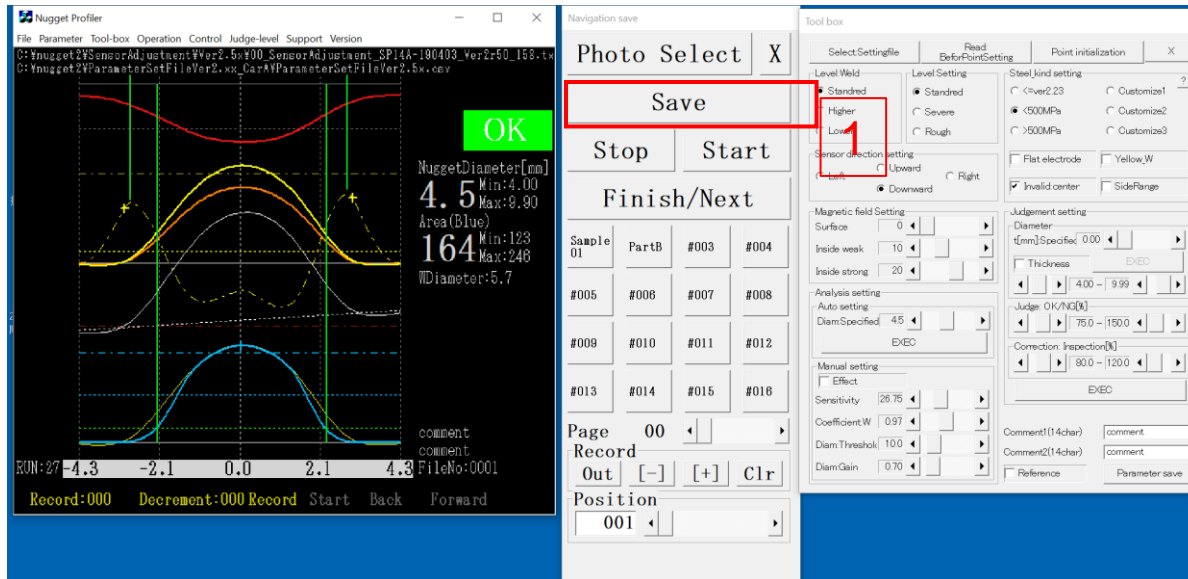
At the bottom of the graph area, the text 'RUN:27-4.3 -2.1 0.0 2.1 4.3 FileNo:0001' is visible. Below the graph, there are buttons for 'Record:000', 'Decrement:000', 'Record', 'Start', 'Back', and 'Forward'. On the right side of the interface, there is a 'Navigation save' panel with buttons for 'Photo Select', 'Save', 'Stop', 'Start', and 'Finish/Next'. Below these are sample selection buttons for Sample 01 to #018, a 'Page 00' indicator, and 'Record Out' buttons. A 'Position' dropdown menu is set to '001'. To the right of the navigation panel is a 'Tool box' with various settings for Level Weld, Level Setting, Steel Kind setting, Sensor direction setting, Magnetic field Setting, Analysis setting, and Manual setting. The 'Parameter save' button in the bottom right of the tool box is highlighted with a red box and a red '1' next to it.

1. Click [Save Parameters].

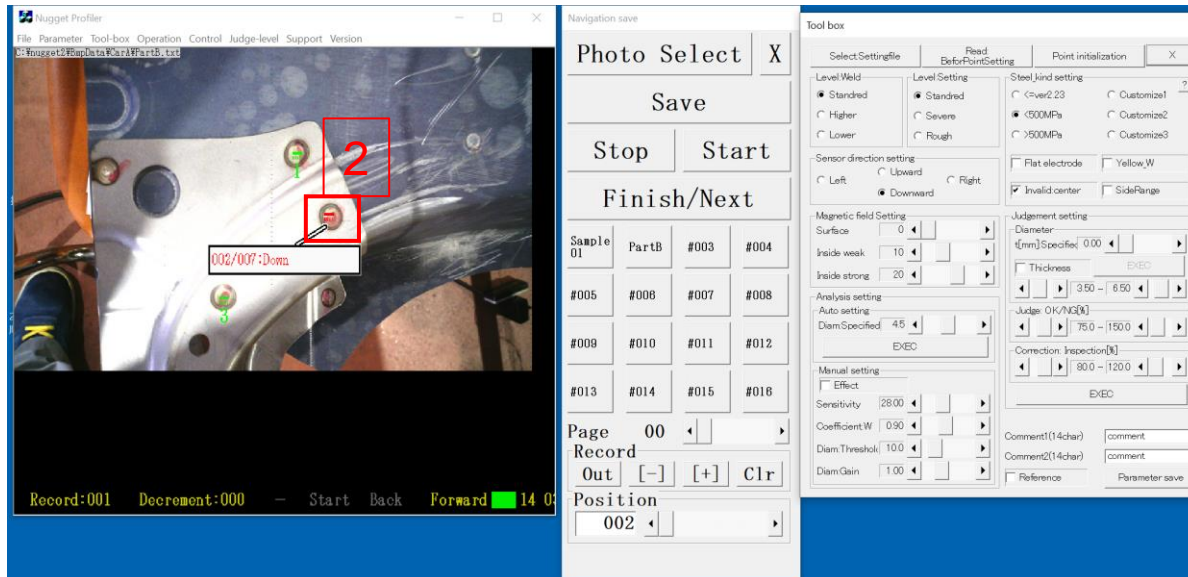
1

Now parameter settings are completed for the first inspection spot.

# Step 3-3. Record the results of inspection with the parameters set



1. Click [Record] in the [Navigation Record] dialog box.  
The inspection results at parameter setting will be recorded.



2. The screen changes.  
Configure settings for the second inspection spot.



# Step 3-3. Set parameters for the second and subsequent inspection spots and record the results

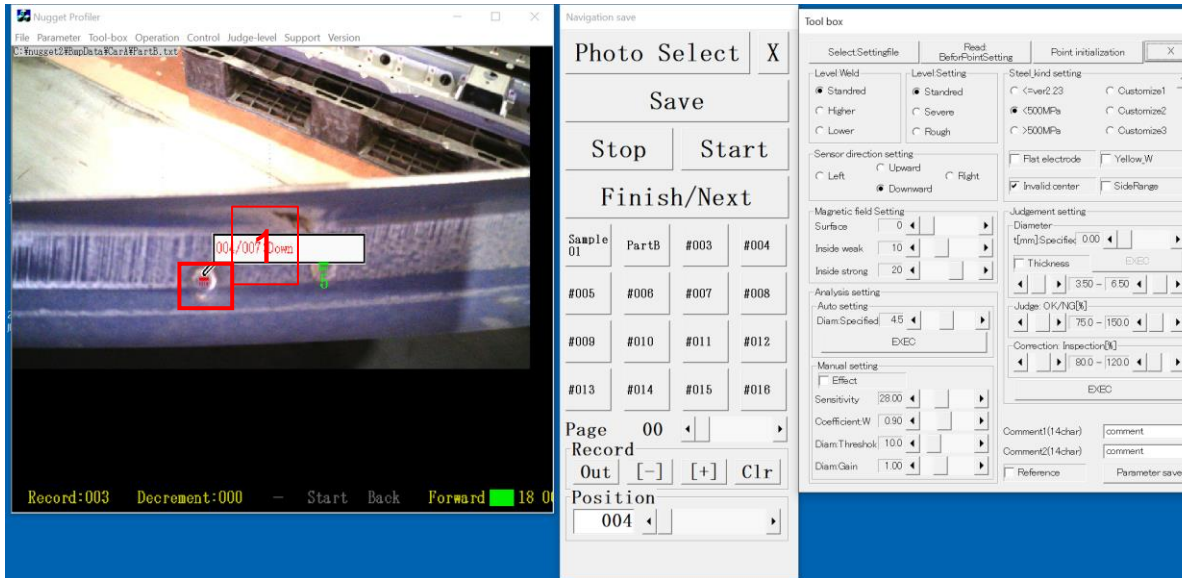
The screenshot shows the Nugget Profiler software interface. On the left, a video feed displays a metal component with two inspection spots marked by red boxes and numbered 1 and 2. A tooltip for spot 2 shows '003/007:Dom'. The central navigation panel includes buttons for 'Photo Select', 'Save', 'Stop', 'Start', and 'Finish/Next', along with a grid of sample numbers from #01 to #016. The status bar at the bottom indicates 'Record:002', 'Decrement:000', and 'Forward'.

1. Set parameters for up to the last inspection spot registered and record the inspection results.

The screenshot shows the Nugget Profiler software interface displaying a graph of inspection results. The graph plots Nugget Diameter [mm] and Area (Blue) against position. The graph shows a peak in diameter and area at position 0.0. The software interface includes a navigation panel with buttons for 'Photo Select', 'Save', 'Stop', 'Start', and 'Finish/Next', along with a grid of sample numbers from #01 to #016. The status bar at the bottom indicates 'Record:002', 'Decrement:000', and 'Forward'. A green 'OK' button is visible in the top right corner of the graph area.

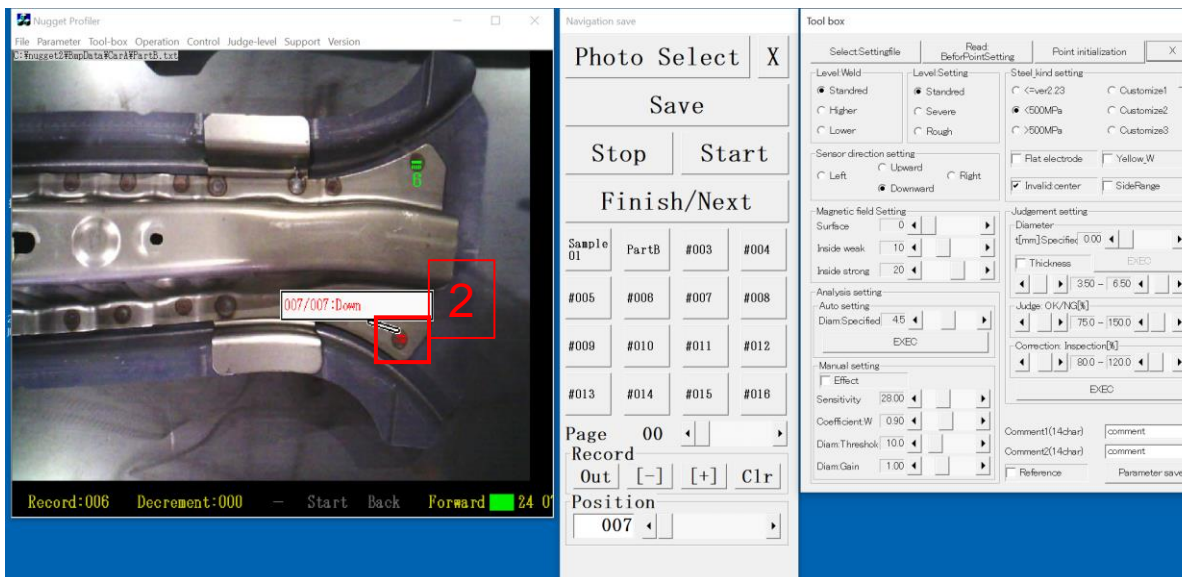


## Step 3-4. Set parameters for the inspection spots on the second and subsequent photographs and record the results



1. The screen changes to the second registered photograph.

Record the parameter settings and inspection results in the same way.



2. Record the parameter settings and inspection results also for the last inspection spot on the third registered photograph.

# Step 3-5. Register all waveform data as a master file

The screenshot shows the Nugget Profiler interface. The main window displays a waveform graph with a green 'OK' button. The 'Navigation save' dialog box is open, showing 'Photo Select' and 'Save' buttons. The 'Tool box' is also visible with various settings.

Navigation save dialog box:

Sample	PartB	#003	#004
#005	#006	#007	#008
#009	#010	#011	#012
#013	#014	#015	#016

Page 00  
Record Out [-] [+] Clr  
Position 007

1. When inspection results are recorded after parameter setting is completed for the last inspection spot, a message is displayed on the screen saying "Inspection completed."

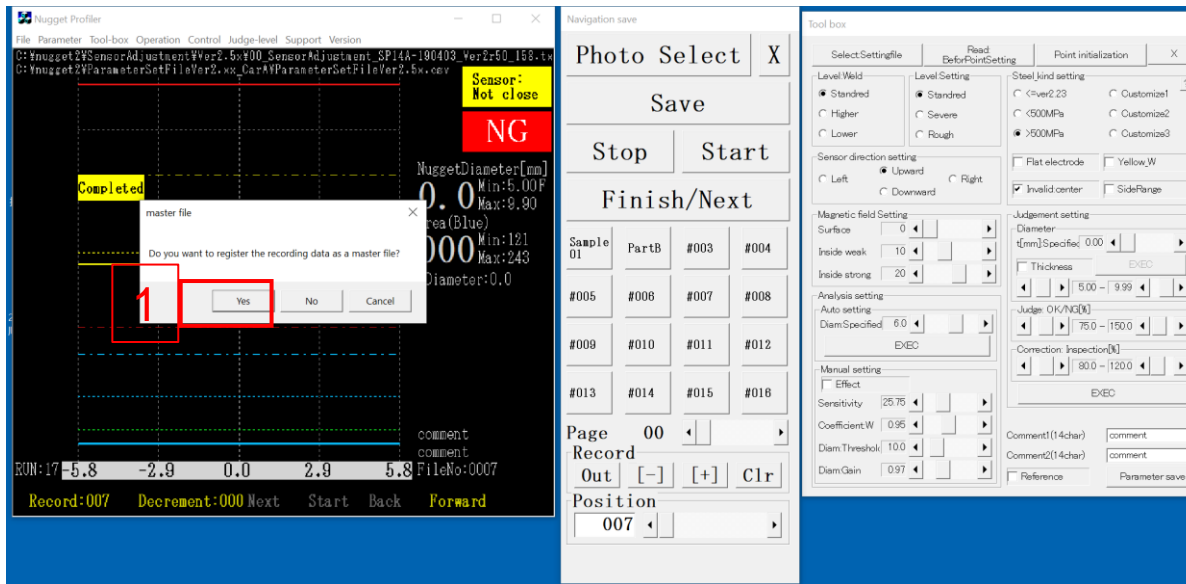
The screenshot shows the Nugget Profiler interface. The main window displays a flat waveform graph with a red 'NG' button. The 'Navigation Record' dialog box is open, showing 'Record Out' button highlighted with a red box and a '2' next to it.

Navigation Record dialog box:

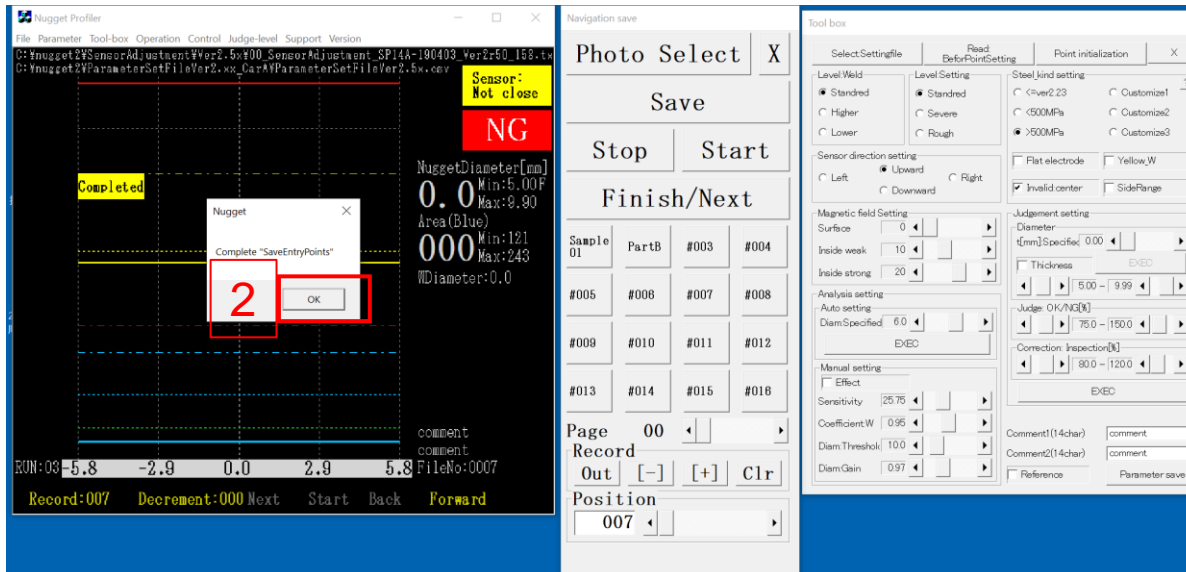
Page	00
Record	
Out	[-] [+] Clr
Position	007

2. Click the [Out] button in the [Navigation Record] dialog box.

# Step 3-5. Register all waveform data as a master file



1. Register inspection waveform as master file



2. It is automatically registered as a master file.

# Step 3-5. Register all waveform data as a master file

The screenshot displays the Nugget Profiler software interface. The main window shows a measurement result of 0.0 mm with a 'Sensor: Not close' warning and an 'NG' (Not Good) status. A 'Nugget' dialog box is open, with the 'OK' button highlighted by a red box and the number '1'. The interface includes a 'Photo Select' window, a 'Navigation save' window, and a 'Tool box' window with various settings for Level Weld, Sensor direction, Magnetic field, and Judgement.

**Navigation save**

Photo Select X

Save

Stop Start

Finish/Next

Sample	PartB	#003	#004
#005	#008	#007	#008
#009	#010	#011	#012
#013	#014	#015	#016

Page 00

Record

Out [-] [+] Clr

Position 007

**Tool box**

SelectSettingfile Read BeforePointSetting Point initialization X

Level Weld:  Standard  Higher  Lower

Level Setting:  Standard  Severe  Rough

Sensor direction setting:  Left  Upward  Downward  Right

Magnetic field Setting: Surface 0, Inside weak 10, Inside strong 20

Analysis setting: Auto setting, DiamSpecified 6.0

Manual setting: Effect, Sensitivity 25.75, Coefficient.W 0.95, Diam Threshold 10.0, Diam Gain 0.97

Judgement setting: Diameter [mm]Specified 0.00, Thickness EXEC, Judge OK/NG[N], Correction Inspector[N], EXEC

Comment(14char) comment, Comment2(14char) comment, Reference, Parameter save

1. completes all operations.

EOF