KSS-ImageNext
KEYSAFETYSYSTEMS

SVM User Manual: Installation & Calibration

April 2018

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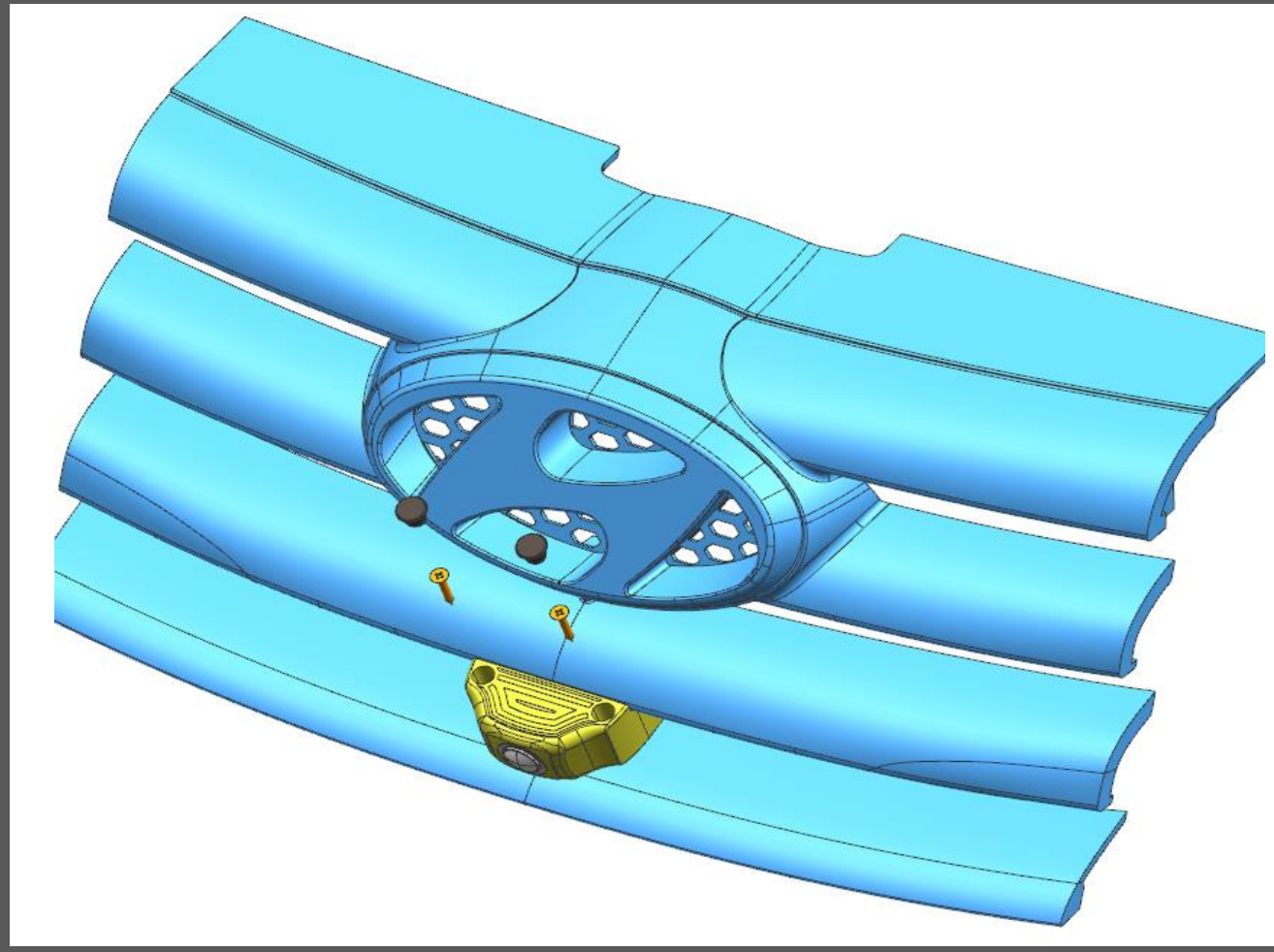
SVM (Surround View Monitoring) Installation

SVM Installation

Front Camera Installation – Front Garnish (Type A)

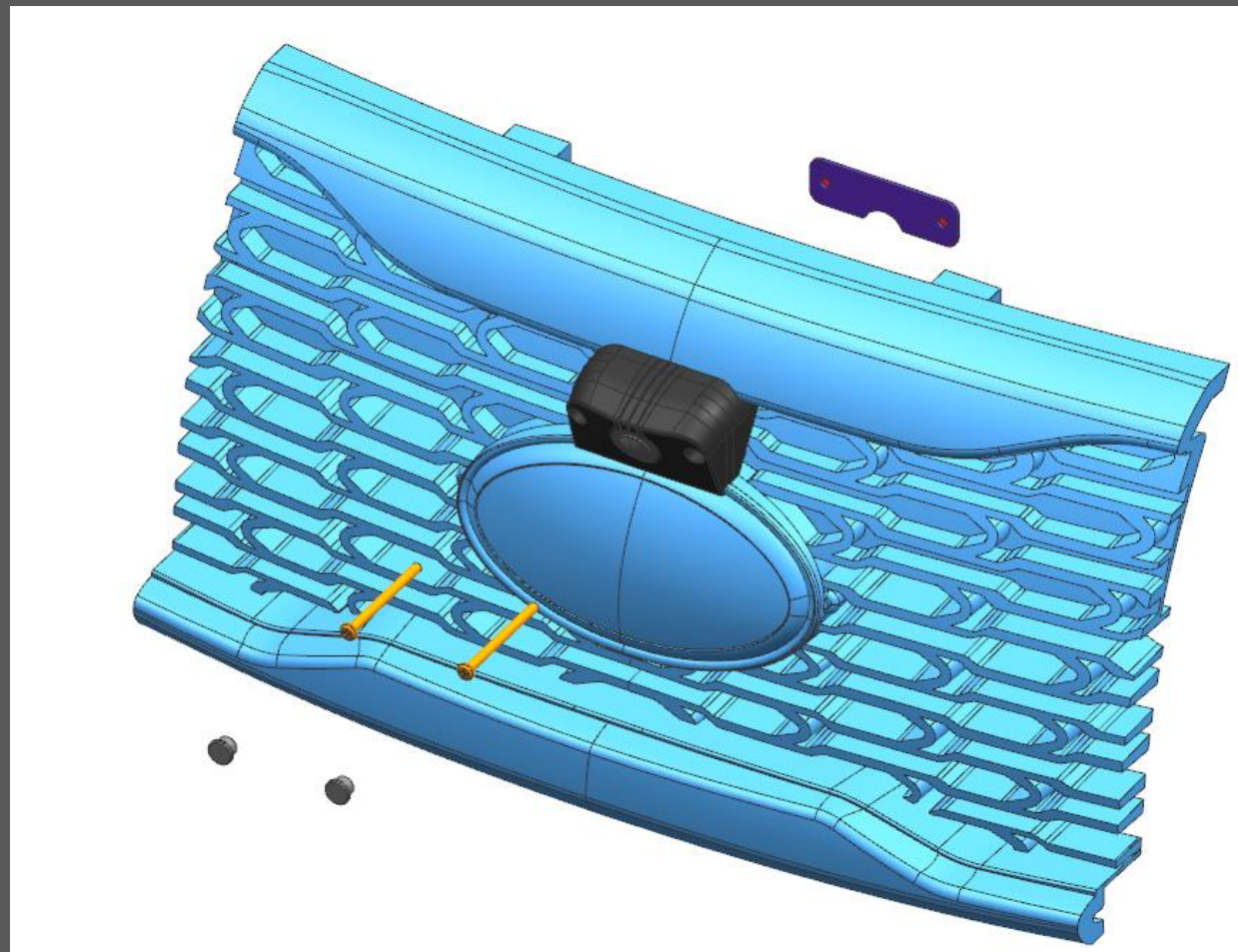
FRONT



SVM Installation

Front Camera Installation – Front Garnish (Type B)

FRONT



SVM Installation

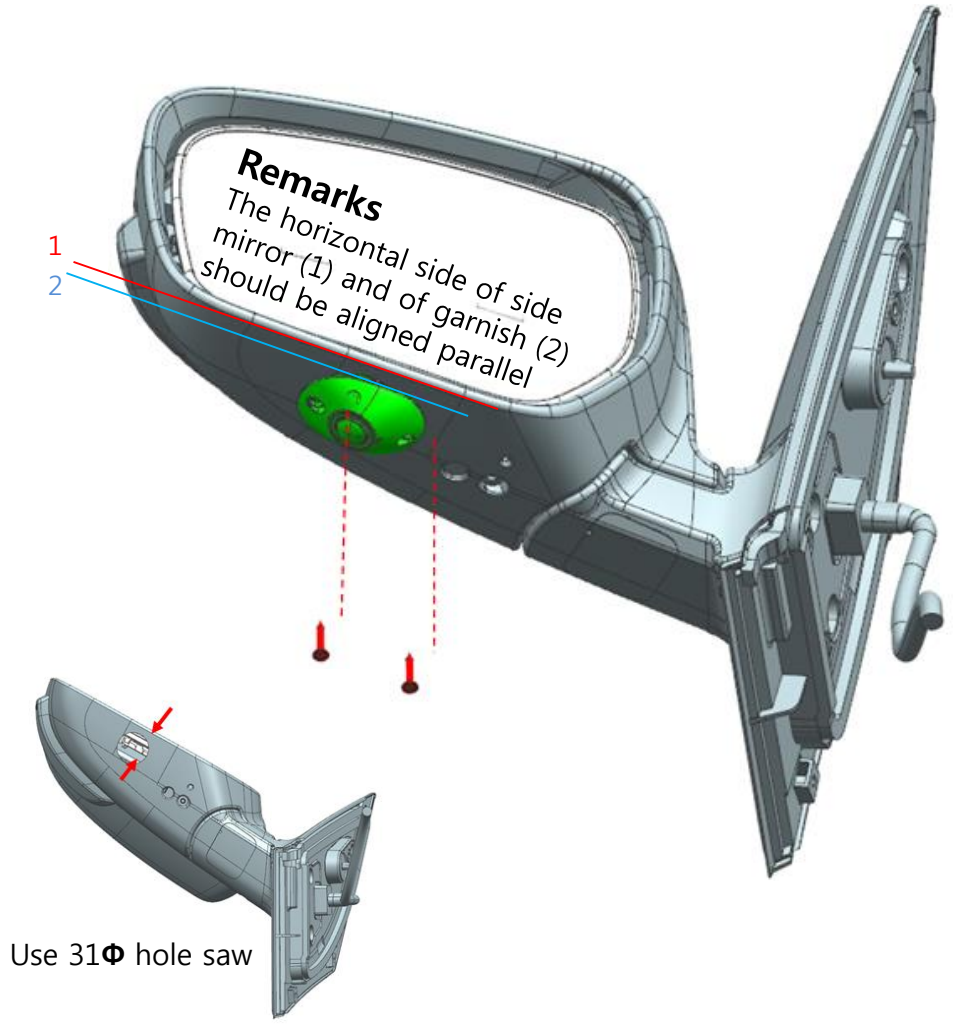
Front Camera Installation – Front Garnish (Type C)

FRONT

SVM Installation

Side Garnish

SIDE



SVM Installation

Rear Camera

REAR

In regards to rear camera installation, it is common to install the camera little to the left or right from the center as it is difficult to install the camera right in the center due to various reasons.

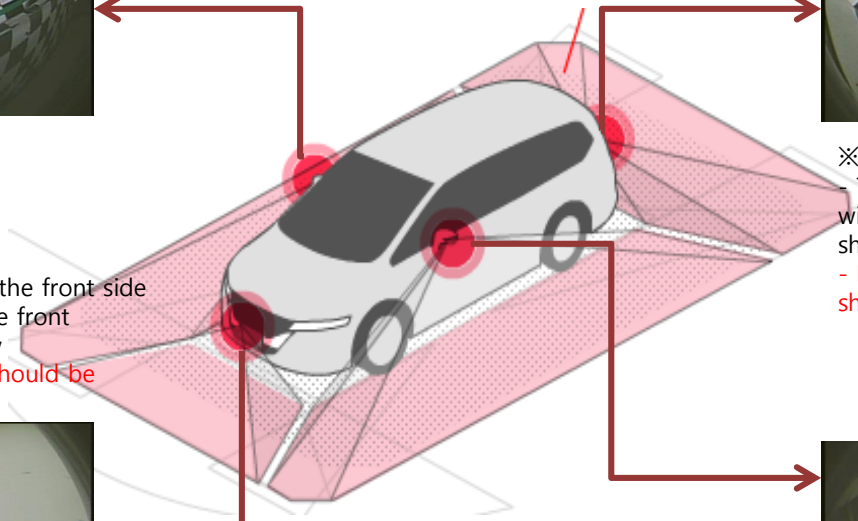
In this case, other types of rear cameras require adjusting the camera in order to point the center; however, OmniVue around view camera doesn't require any adjustment but to be installed parallel.

Camera Installation Guide – Passenger Vehicle

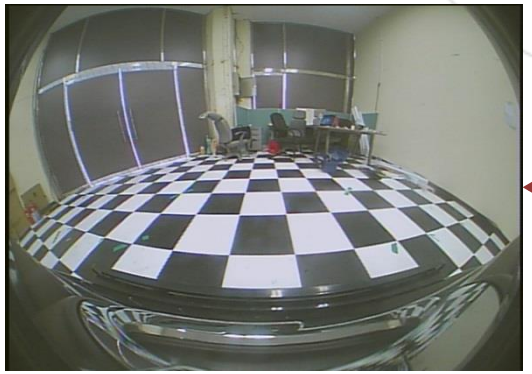
Camera Installation Guide

※ Right Side View
- The camera should be installed to face the floor surface but the view is required to show the side of the vehicle
- Tips of the front & back parts of the vehicle should be shown on the view in parellel
- No more than 40% of the vehicle should be shown in the view

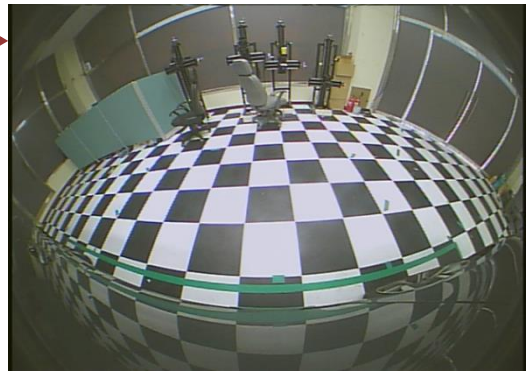
※ Rear Side View
- The camera should be installed on the rear side with 25~30° downward angle and the rear bumper should be shown in the view
- No more than 40% of the vehicle should be shown in the view



※ Front Side View
- The camera should be installed on the front side with 25~30° downward angle and the front bumper should be shown in the view
- No more than 40% of the vehicle should be shown in the view



※ Left Side View
- The camera should be installed to face the floor surface but the view is required to show the side of the vehicle
- Tips of the front & back parts of the vehicle should be shown on the view in parellel
- No more than 40% of the vehicle should be shown in the view



SVM Installation

Camera Installation Guide – Passenger Vehicle

Camera

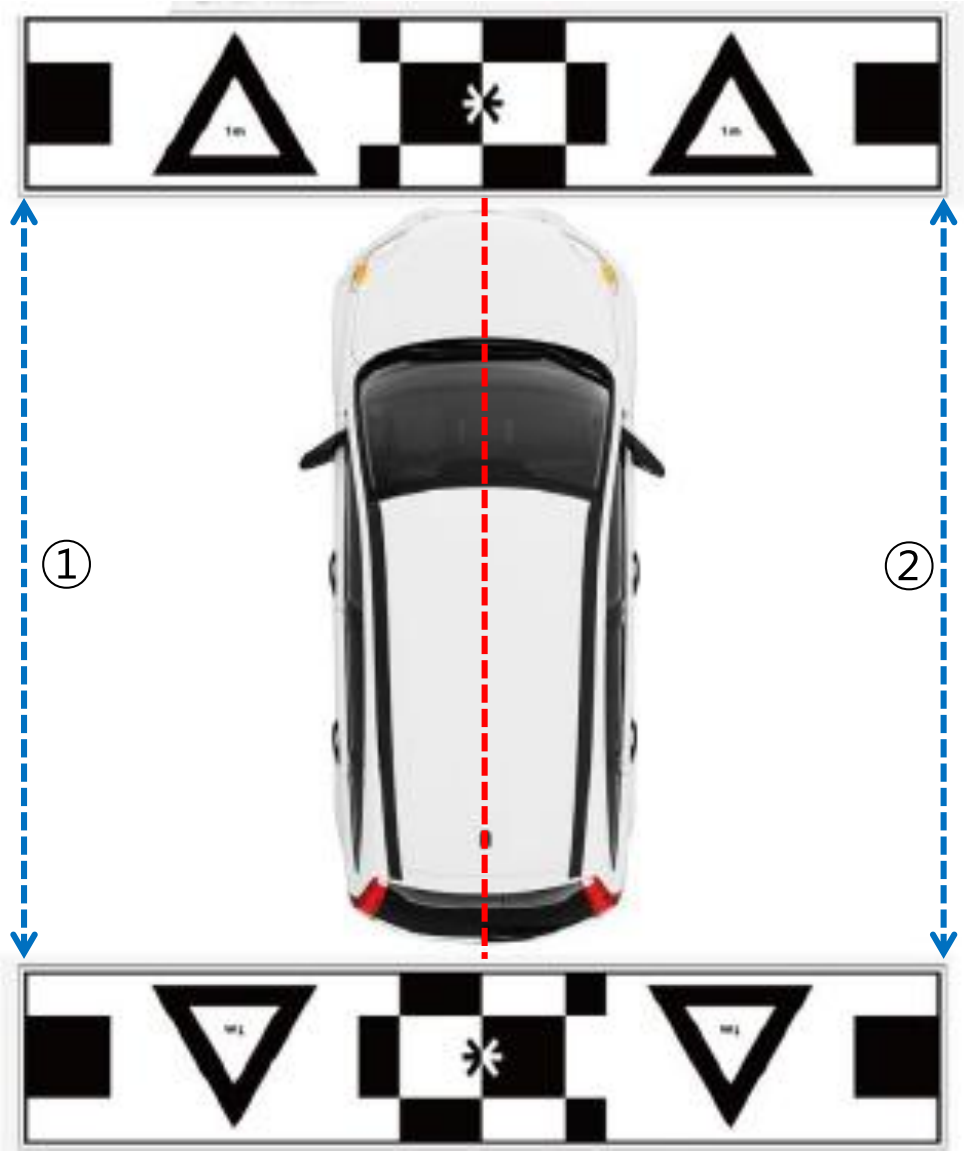
1. All four(4) cameras are identical, except for the front camera which includes waterproof connector.
2. It is highly recommended for the front camera to be installed on the front center of the car.
   (If not, calibration may not be possible)
3. Cameras have designated up/down/left/right sides and they cannot be modified with the software.
   (Refer the pictures below for the correct installation positions)
4. Because the left and right side garnishes are different, the correct side garnish requires to be installed on each side. (The side cameras themselves are identical)

Contents

Calibration Pattern Installation

Calibration Pattern Installation

OmniVue calibration is a synthesizing process of the four (4) 185° cameras based on the flat surface.
This process is required due to various vehicle sizes and installation positions.
(OmniVue calibration must utilize the pattern provided by KSS-ImageNext)



1. Calibration process must be conducted on FLAT surface. If not, the lanes on the road may look distorted and this can lead to a customer complaint.

2. **The center mark of the pattern and the center line of vehicle must match.** Rear camera may not be required to be installed in the center but the pattern must be based on the center line of vehicle. The lengths of ① and ② must be identical.

3. **The calibration pattern should align with the end line of the front bumper through the monitor** and all three (3) apexes of each triangle should be shown when installing. If the installing site does not have sufficient space, the rectangles on each side can be folded and does not have to be shown.

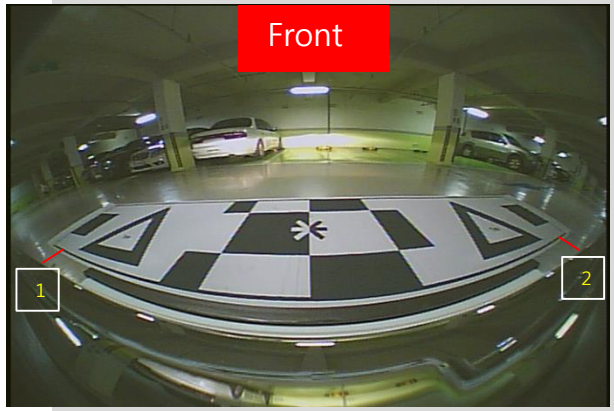
4. All four (4) views (Front, left, right, rear) should display both triangles and all three (3) apexes of each triangle should be shown clearly. If any of the apexes is unclear or covered, please contact KSS-ImageNext.

5. If there is a considerable difference in luminance, a part of a triangle might not be clear or distinguishable. Therefore, it is recommended to conduct the process in the environment with even luminance.

Calibration Pattern Installation

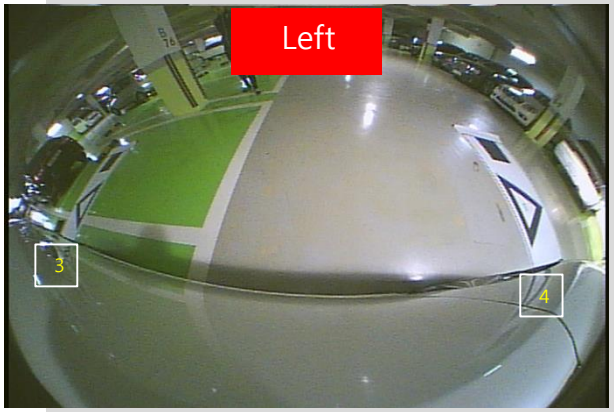
REMARKS

1. The calibration pattern must be installed on FLAT surface.
2. The calibration pattern should align with the front bumper through the monitor.
3. If the calibration pattern is not installed correctly, the result may not be reliable despite the correct camera installation.
4. If the floor has grid lines, it would certainly help the calibration process.
5. The distance of the pattern from the driver side must be identical with it is from the passenger side.



This image on the left is an ideal view image of the front pattern installation. The distance from both left (#1) and right (#2) side of the front bumper should look identical as shown in the image.

The pattern for the rear view should be installed aligning with the center of vehicle. It is rare to be able to install the rear camera right in the center of bumper; Therefore, using a tape measure is recommended for accuracy when installing the pattern.



For the left and the right side, the distance to the front & rear triangle from the vehicle should be identical. If not, the patterns need to be re-installed.

In result of perfect calibration, #4 on the left and #5 on the right should be the same distance from the vehicle as well as #3 on the left and #6 on the right. Use the key button/mode button to switch and confirm each view.

Contents

Capturing Calibration Views: SB/NS/OmniDrive

Capturing Calibration View & Update

The OmniVue calibration kit is required for capturing calibration views and installing updates.
Insert the SD card, which has the captured view files saved, to the calibration kit and connect the kit to the ECU for the updates as shown below.

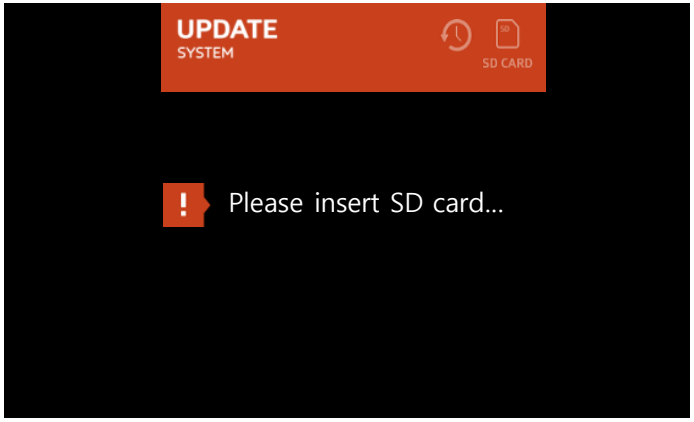
Capturing Calibration View & Update

	SB		HDNS	NS
Type	Standard	Smart Display Version	Standard	Standard
# of View Modes	5	7	8	8
Usage of the Calibration Kit	Use the Calibration Kit	Use the Calibration Kit	Use the Provided USB	Use the Calibration Kit
Location of: Captured View File	N/A	N/A	ovod Folder	ovns Folder
How to: Capture Views	Hold Key Button/Mode Button for 2sec	Hold Key Button/Mode Button for 2sec	Hold Key Button/Mode Button for 3sec	Hold Key Button/Mode Button for 3sec
Location of: Updates Files (Top Level of the SD Card)	Config / Logo / Lut / Osd / Param	Config / Logo / Lut / Osd / Param	ovod (Top Level Folder)	ovns (Top Level Folder)
How to: Install Updates	Press Key Button/Power Button	Press Key Button/Power Button	Update Automatically when the SD Card is Inserted	Update Automatically when the SD Card is Inserted

NS: Capturing Calibration View

1

When the calibration kit is connected to the ECU, the following screen will appear. (If not, please contact KSS-ImageNext)



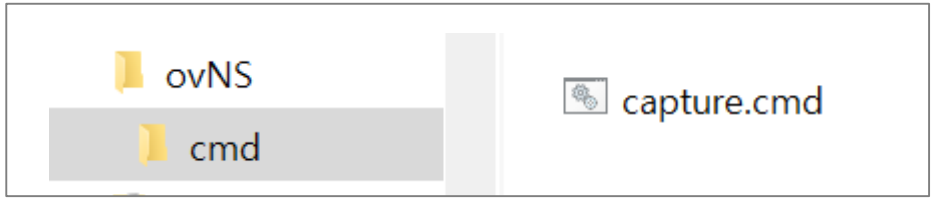
< Initial Updating Screen>

2

When the captured image files (ovNS/cmd/capture.cmd), downloaded via OVC website or E-mail (ovNS/cmd/capture.cmd), is inserted, the front camera view will appear. (If not, the files might be damaged)

< Front Camera View >

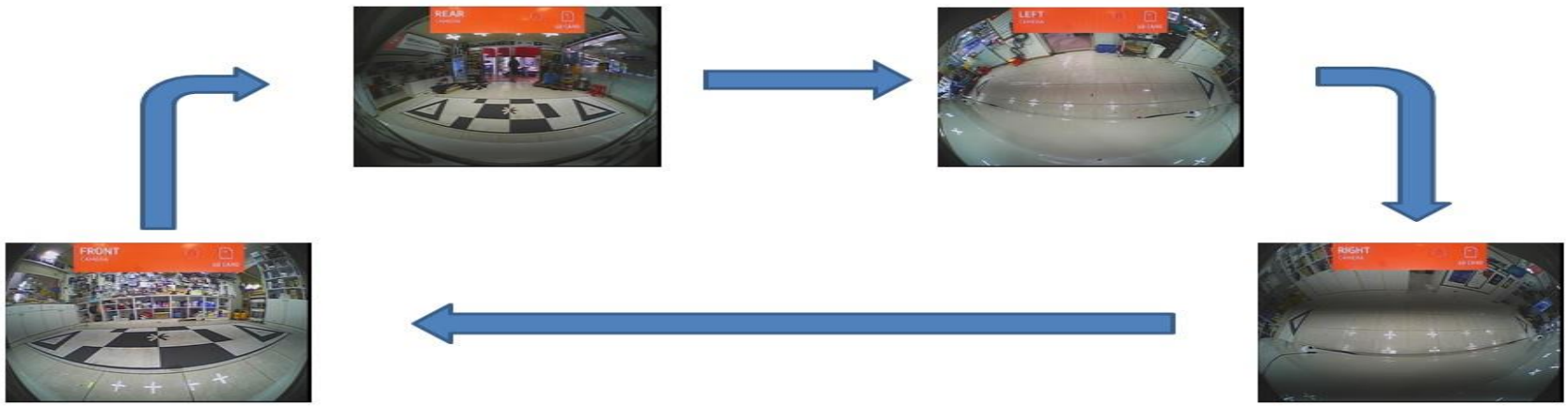
< SD Card Folder when Capturing the View>



NS: Capturing Calibration View

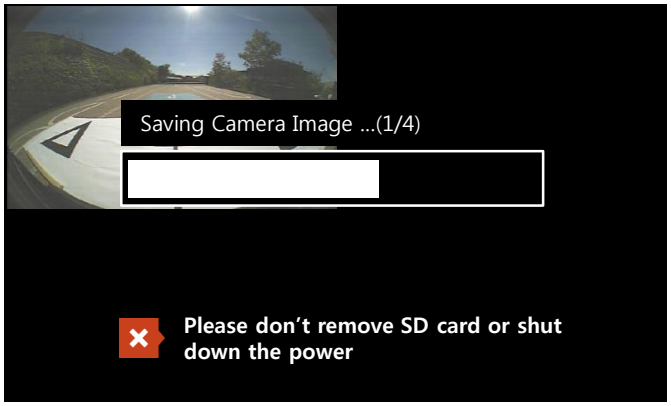
3

Check each view and confirm that the patterns are installed correctly. (Refer to the photos below)
The mode button changes the view in order of Front → Rear→ Left → Right.

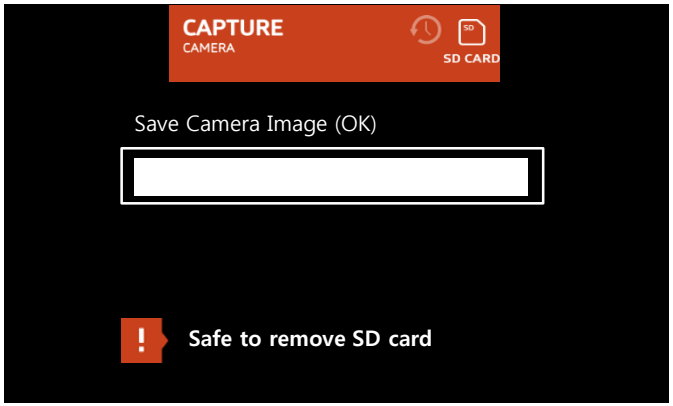


4

After checking the views completely, hold the mode button for 3 seconds to save the images on the SD Card (./ovNS/image).



< Capturing View >



< Capturing Completed>

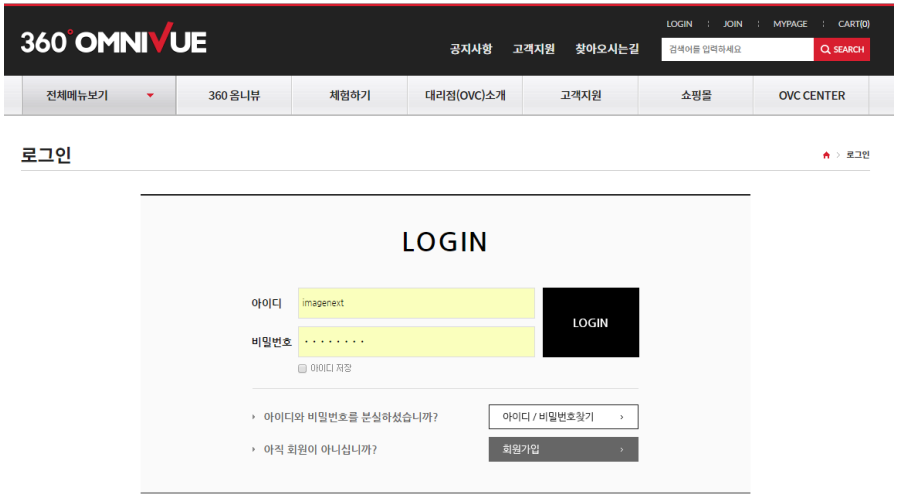
Contents

How to Download Calibration Program

Download Calibration Program

1

Log in to www.omnivue.co.kr
(You need to be approved upon the registration)

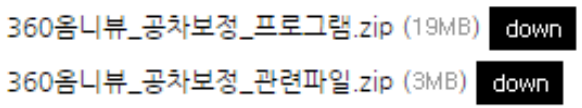


2

Click "OVC CENTER" / "360 OmniVue Calibration Program and Manual"

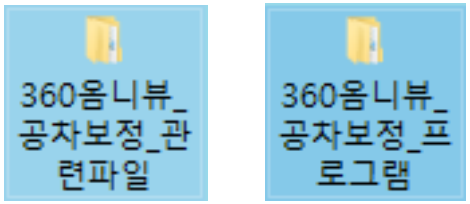
3

Download all the attachments



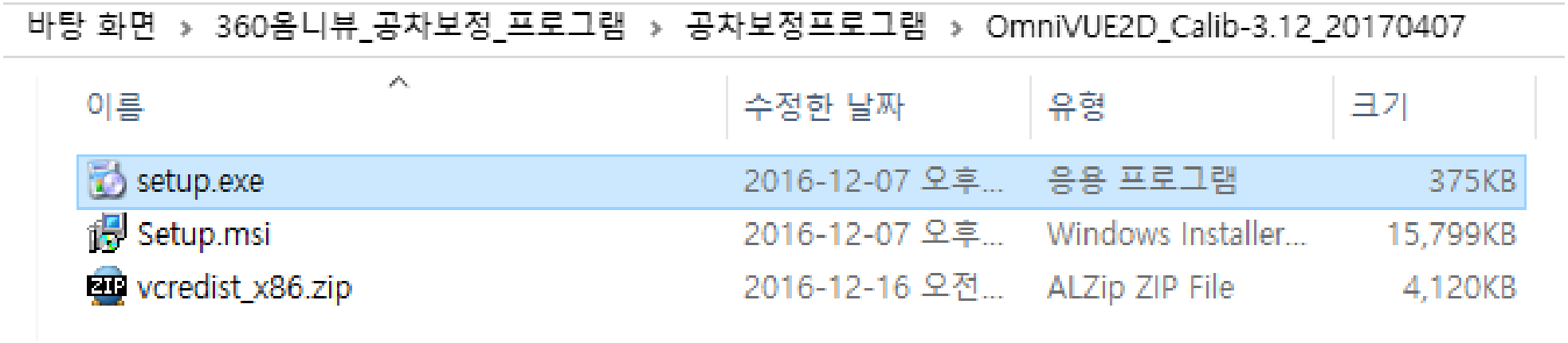
4

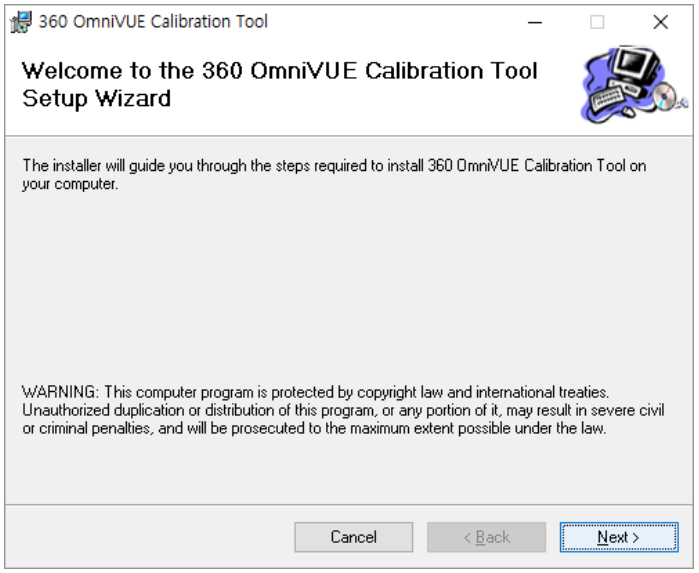
Unzip the attachments



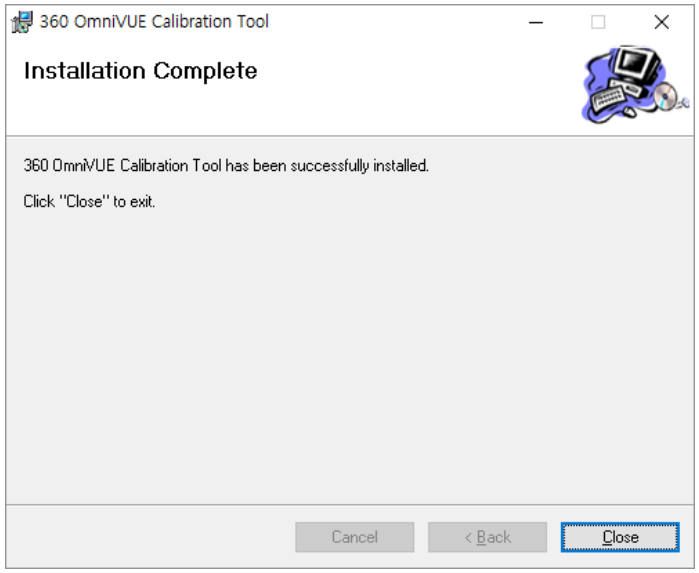
Download Calibration Program

5 Click "360OmniVue_Calibration_Program" folder and execute "setup.exe" file



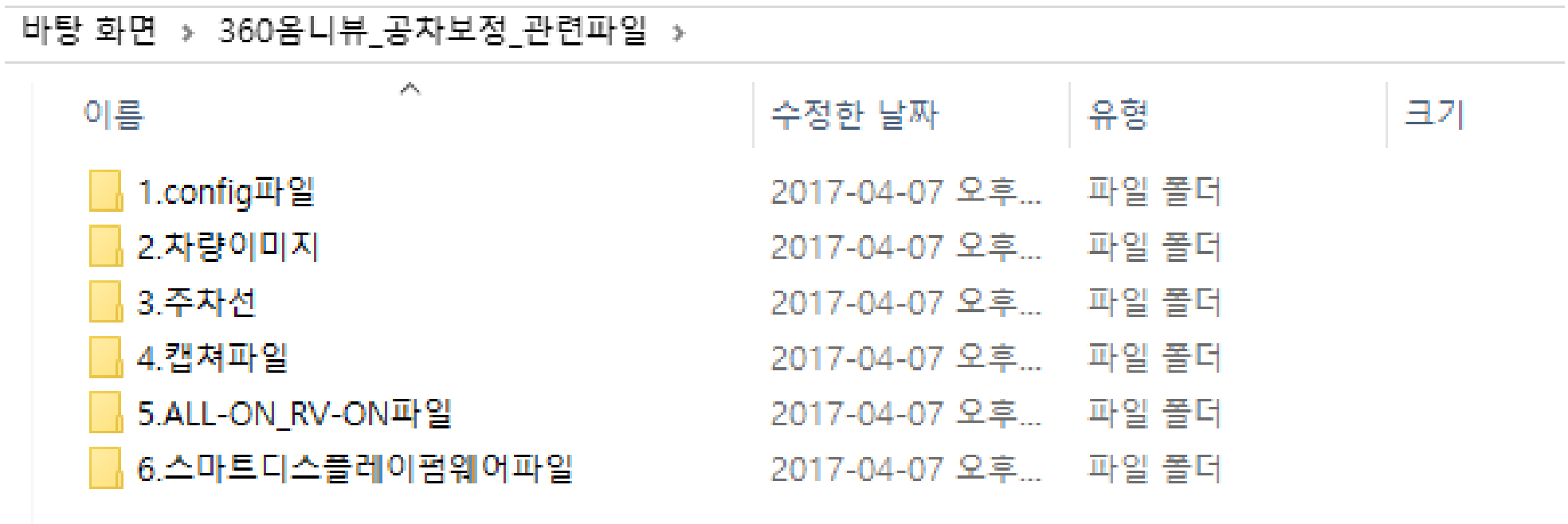


Once the installation is completed, the following icon will appear on your Desktop.



Download Calibration Program

6 Copy "360 OmniVue_Calibration_AssociatedFiles" folder from your Desktop.



There are following files for calibration in "360OmniVue_Calibration_AssociatedFiles" folder:

1. Config File : Initial set up files for calibration for all OmniVue models (SB/NS/Drive)
2. Vehicle Image : "TOP VIEW" image and "NS FULL TOP VIEW" image file for calibration
3. Parking Guidance Lines : OmniVue "Parking Guidance Lines" image file (There is also a file to delete the lines if not required)
4. Captured File : For the captured calibration images for every model
5. ALL-ON_RV-ON File : File to decide whether both of video outputs should be always on, or CVBS-RV only
6. Smart Display Firmware File : Required file for Hyundai & Kia's Smart display interface platforms

Contents

Calibration Tool Instructions

Calibration Tool

1

Double click 

on your Desktop

< Initial Screen >

This calibration tool should be used by the authorized users only. Copying, reproduction, modification, distribution, display or transmission of any of the contents of this program for any purpose without the prior written consent of KSS-ImageNext is strictly prohibited.

Please follow the instruction carefully. If the calibration pattern and the cameras are installed impeccably, the calibration should be accurate.

- Editing Order: 1. Config Load → 2. Image Load → 3.Apply AVM → 4.Save LUT → 5.Exit
- This calibration tool is for all OmniVue models. (Each model has its own config file)
- This calibration tool comes with the specified Config file/ vehicle image/ parking guidance land image.

Calibration Tool

Calibration Tool - Main Menu

Displaying Calibration Tool Version (Latest Ver. 3.11)

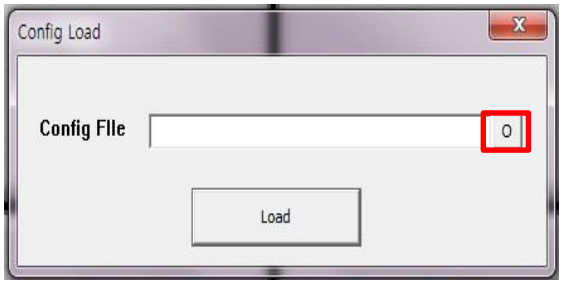
	To load the necessary calibration file based on the correct model(NS/SB/Drive)/ vehicle type (Passenger/RV/Heavy)
	To load the captured view images from all four (4) cameras for calibration
	To edit all the views including the TOP VIEW
	To save the edited file
	To exit the program

Calibration Tool

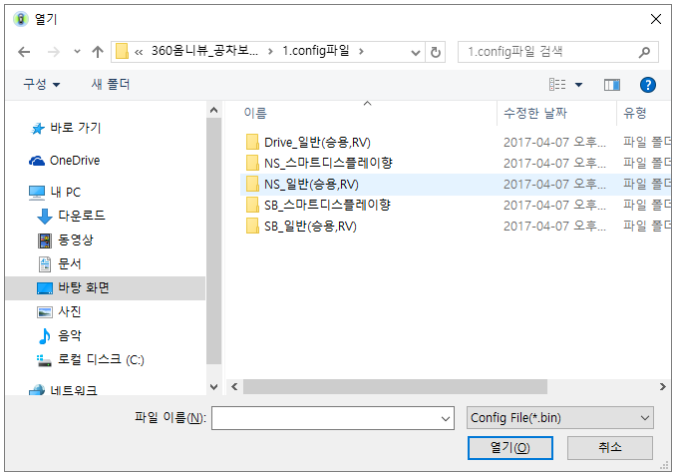
2

Double click 

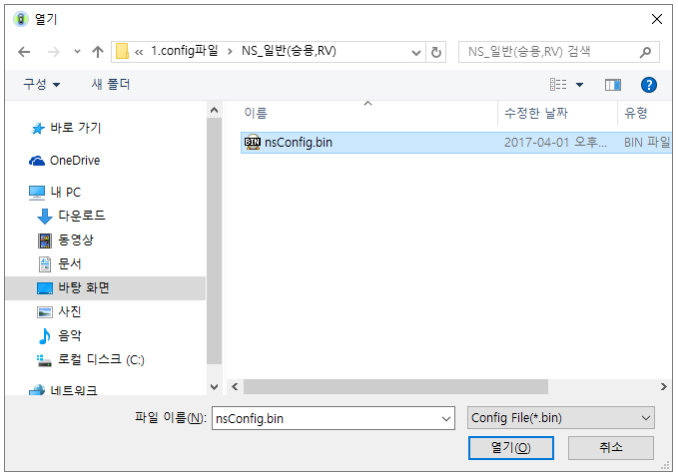
button



[Image #1]



[Image #2]



[Image #3]

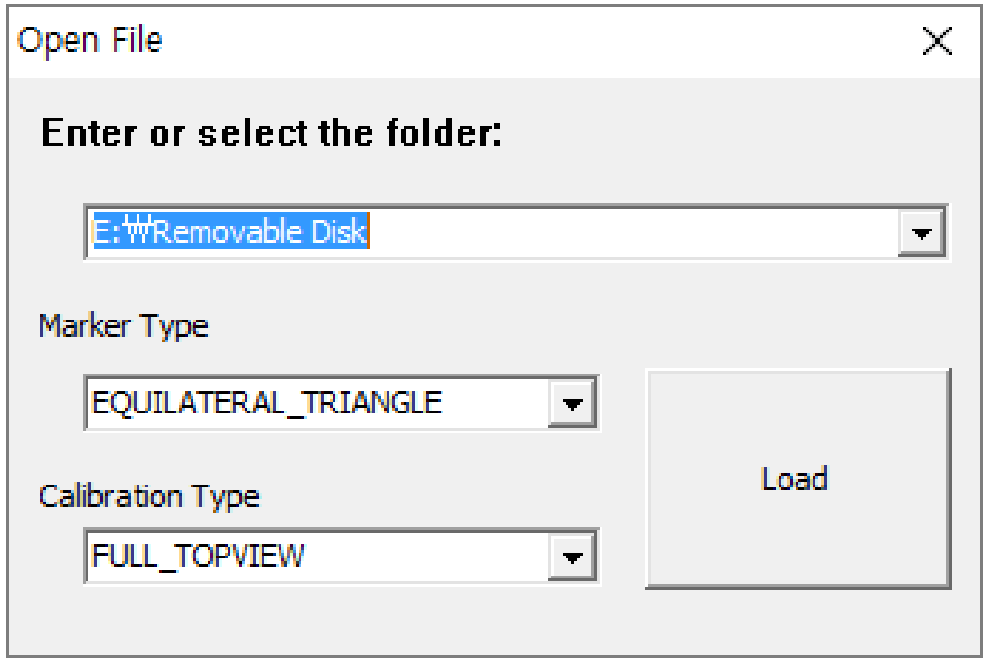
1. Click “Config Load” button on the menu
2. When a new window opens, click “browse” button on the right (Image #1)
3. Go to: Desktop → 360OmniVUE_Calibration_AssociatedFiles (Image #2)
4. Select the correct model folder and open “config” file (Image #3)

Calibration Tool

3

Once you load “Config” file, click 

and load the captured view images.



1. Insert the SD card to your PC
2. Click “Image Load” button
3. When “Open File” window opens, select the SD card drive then click “Load” button
4. The captured view images will appear as shown above

Calibration Tool

4

Mark the accurate positions of all the apexes.
For the information, apex #1 from the front view is as same as apex #4 from the left view.
Through this process, the program will be able to synthesize the four (4) images.

It is required to mark the accurate position of all the apexes on every view – front, rear, left, and right.
If inaccurate positions are marked, it could be possible for the view or the line to look distorted.

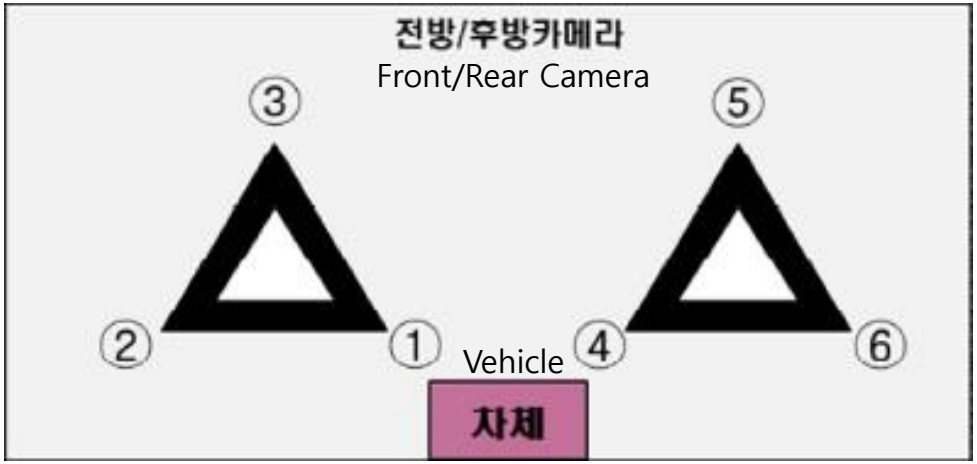
Each apex has an assigned number based on its location; From the vehicle, the closest apex of a triangle is marked as #1 and the rest of the apexes are numbered clockwise.

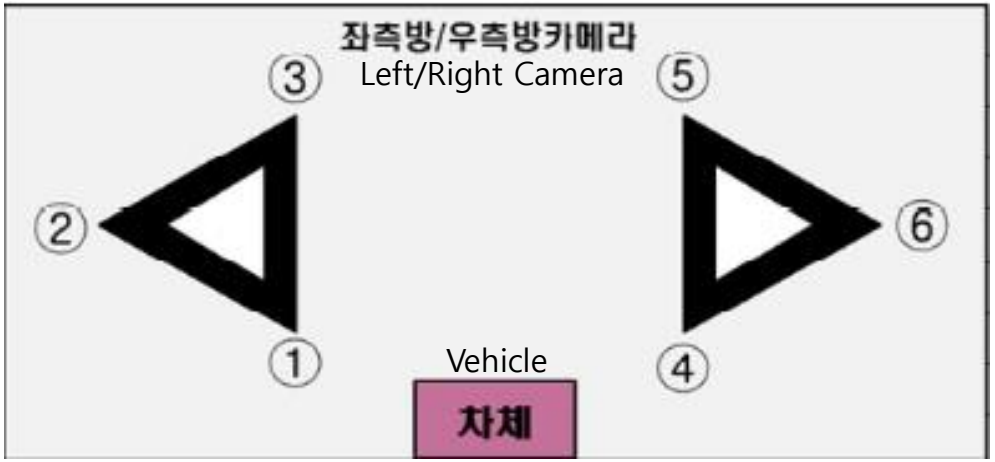
If a mark is too off from the triangles, an error message will appear when selecting "Apply AVM" button.

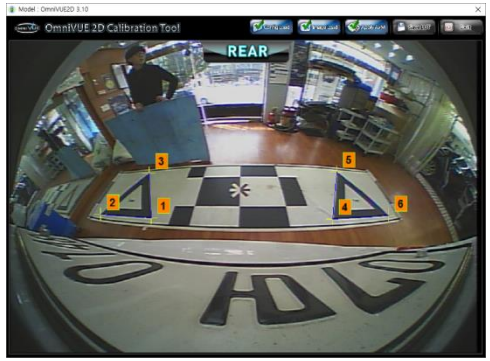
Calibration Tool

4

The numbering order must be followed when marking the apexes.
To mark the apex, click the left button on the mouse whereas click the right button on the mouse to tune.
The arrows on the keyboard can be used to tune in detail.



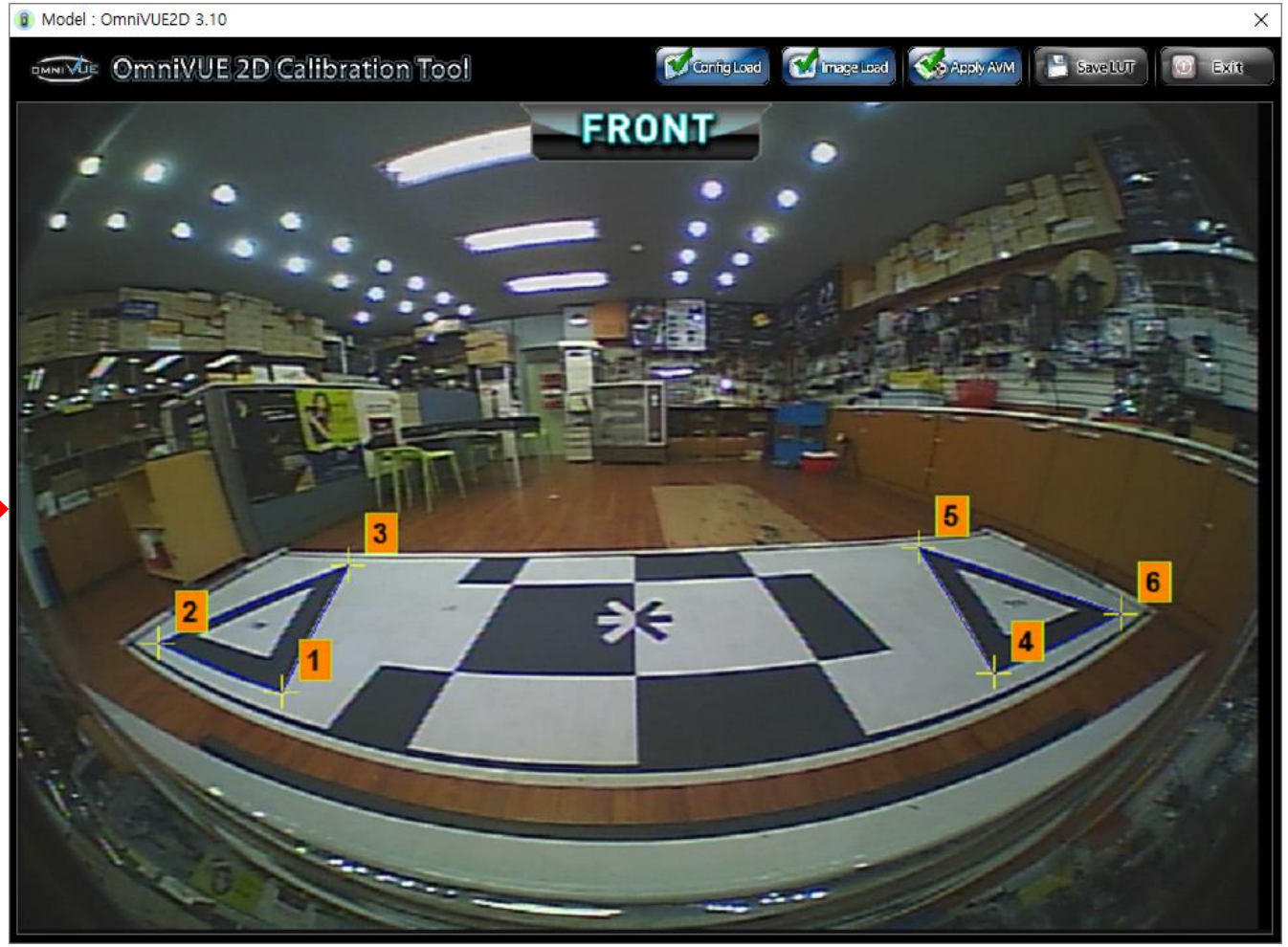




Calibration Tool

4

Double click on the view in case of a zoomed-in view is needed for accuracy.
To return to the previous view, double click again.



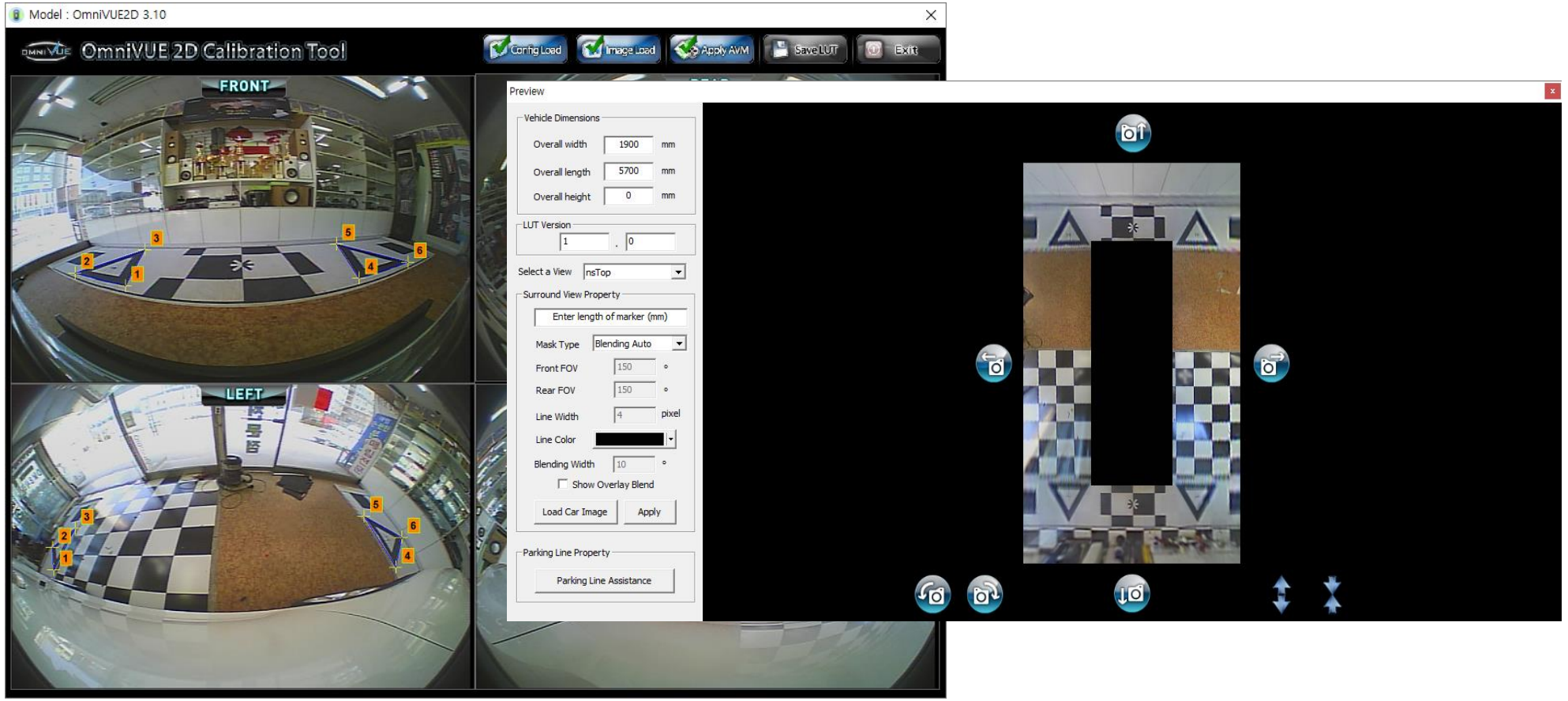
For instance, when "FRONT" view is double clicked, a zoomed-in view will appear in order to mark the accurate position of the apexes more easily.

Calibration Tool

5

After marking the apexes, select 

button for “Preview” window.
You will be able to set up each view on the “Preview” window.

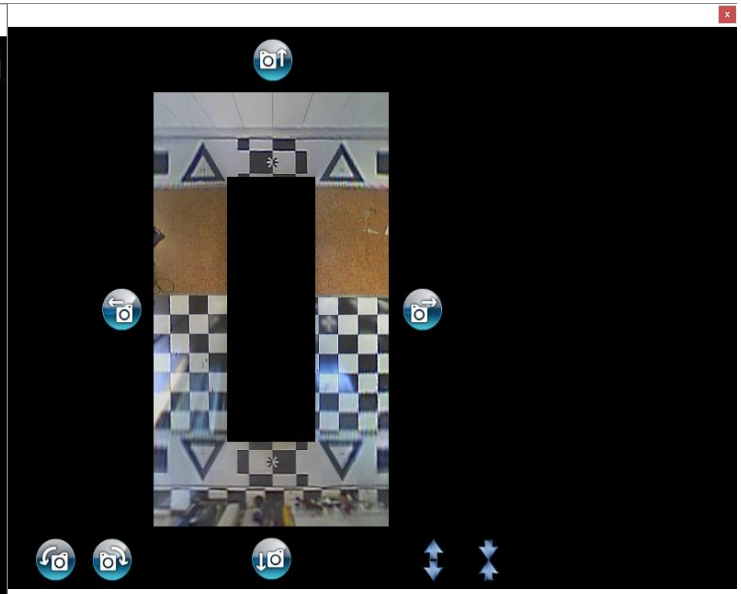


Calibration Tool

5

If you adjust any apex on the default screen, click 

for the updated "Preview" window.
(It will be easier to have both default screen and "Preview" window on when editing on the "Preview" window - refer to the pictures below)



When "TOP VIEW" seems distorted, move the marks on the apexes a bit in all ways and check if the "Preview" window is updated without the distorted look.

5

Set Up Instruction for “Preview” Window

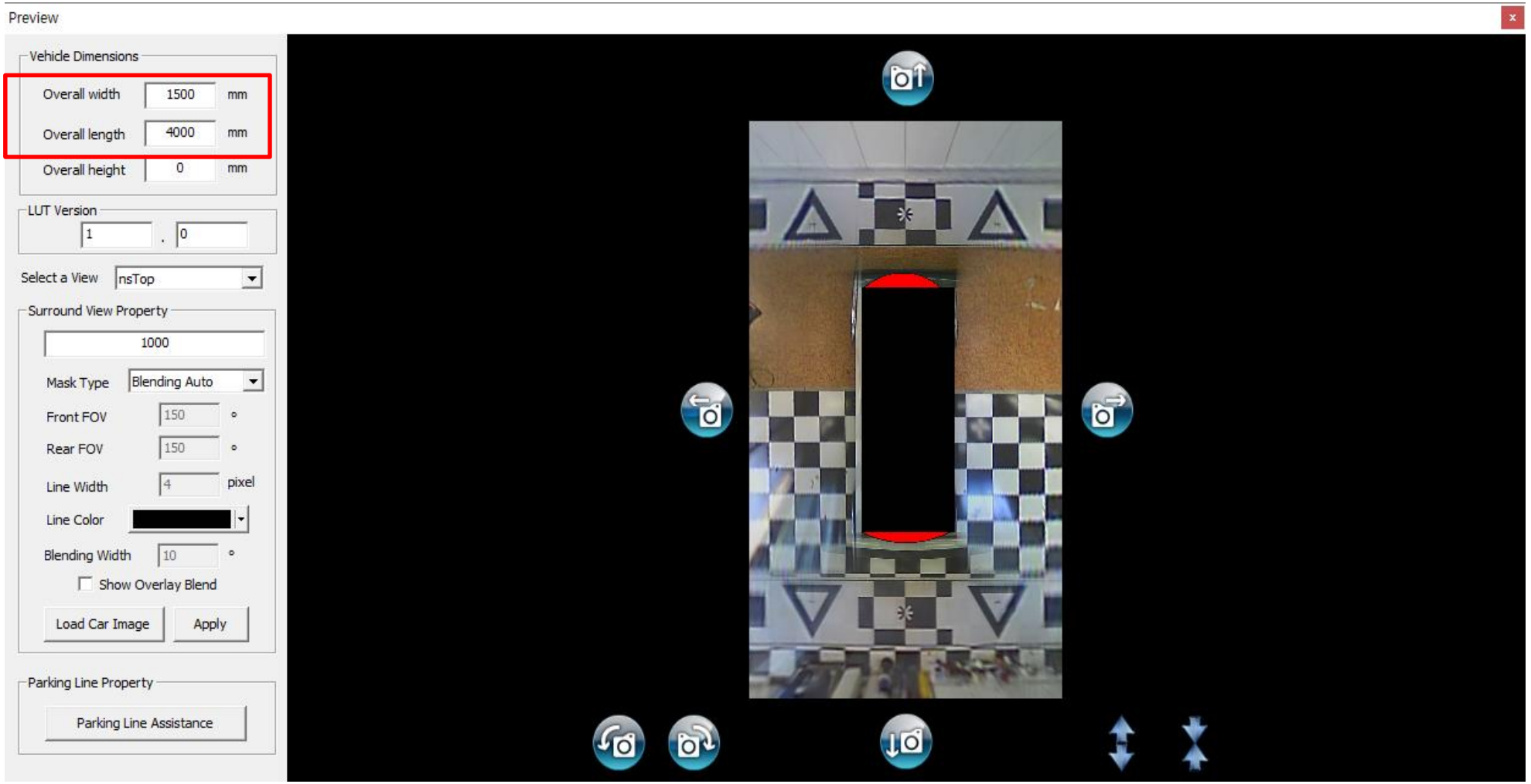
1. In “TOP VIEW”, cover the vehicle with a black mask.
2. In “TOP VIEW”, insert a vehicle image (vertical) then select “Apply” button.
3. Select “nsFTop” view, insert a vehicle image (vertical).
4. Select “nsRTop” view, insert a vehicle image (vertical).
5. Select “nsLSTop” view, insert a vehicle image (horizontal).
6. Select “VIEW_FRONT” view, adjust the view for the best look.
7. Select “VIEW_FRONT_FULL” view, adjust the view for the best look.
8. Select “VIEW_REAR” view, adjust the view for the best look.
9. Select “VIEW_REAR” view, create a parking guidance line by clicking “Parking Line Assistance”.
10. Select “VIEW_REAR_FULL” view, adjust the view for the best look.
11. Select “VIEW_LEFT” view, adjust the view for the best look. (This view should be a mirrored view of “VIEW_RIGHT” view)
12. Select “VIEW_RIGHT”, adjust the view for the best look. (This view should be a mirrored view of “VIEW_LEFT” view)
13. Click “Save LUT” button to save.

REMARKS:
-It is not required to follow the exact order above but it is highly recommended.
-Unless required, using other functions that aren’t reviewed in this instruction is not recommended.
-Adjusting “TOP VIEW” is the most important step of the process. It is recommended to adjust “TOP VIEW” first then to edit the rest of the views.

Calibration Tool

“Preview” Screen Set Up - 1. Adjust the Mask Area

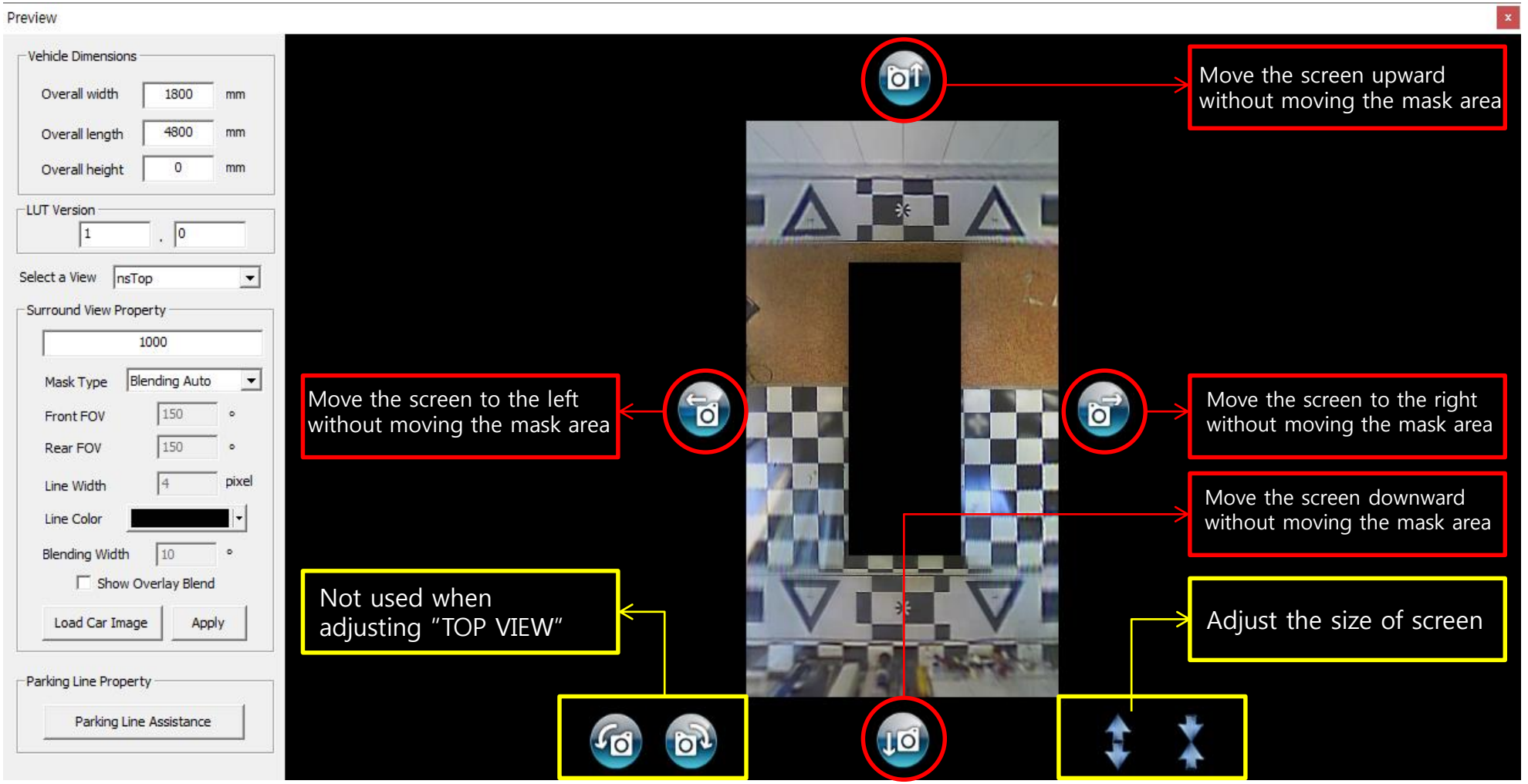
Adjust the size of mask area in order to cover the vehicle on the screen by editing the values on “Overall width” and “Overall length” fields.



Calibration Tool

“Preview” Screen Set Up - 1. Adjust the mask area (complete)

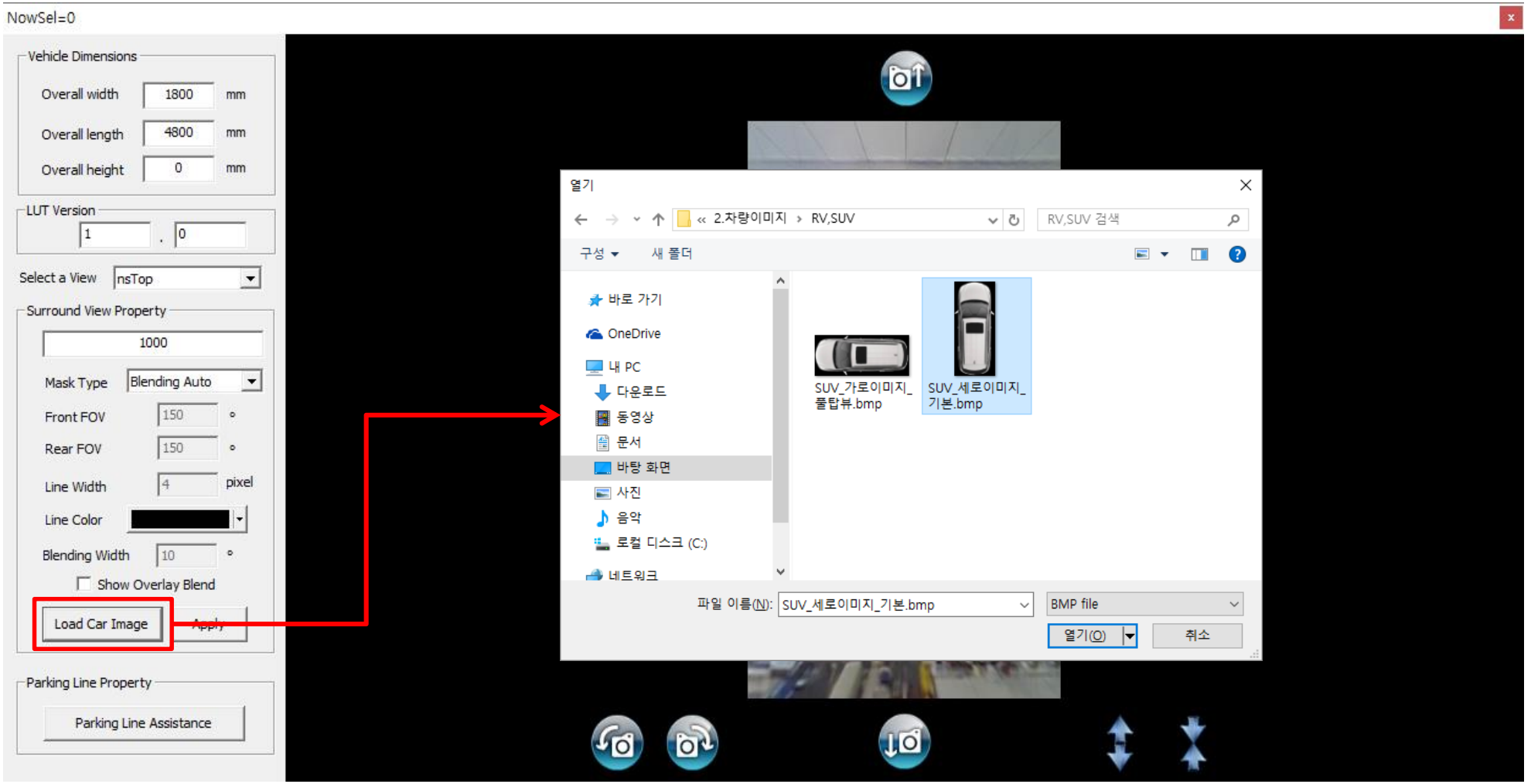
Adjust the size of mask area in order to cover the vehicle on the screen by editing the values on “Overall width” and “Overall length” fields. (Refer to the notes below)



Calibration Tool

“Preview” Screen Set Up - 2. Upload the Vehicle Image

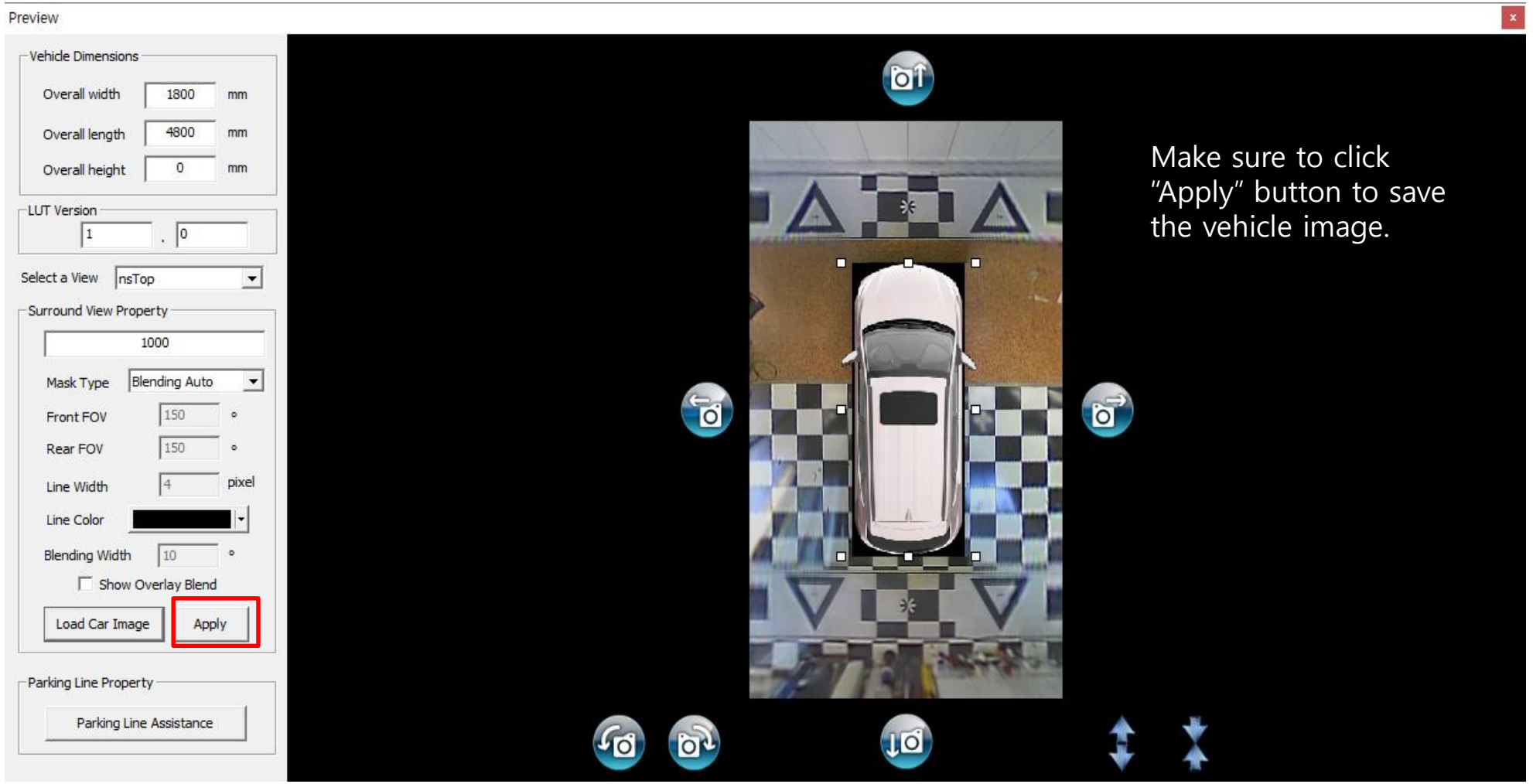
This step is to load the appropriate vehicle image, which is provided with the program, to cover the mask area.



Calibration Tool

“Preview” Screen Set Up - 2. Upload the Vehicle Image (complete)

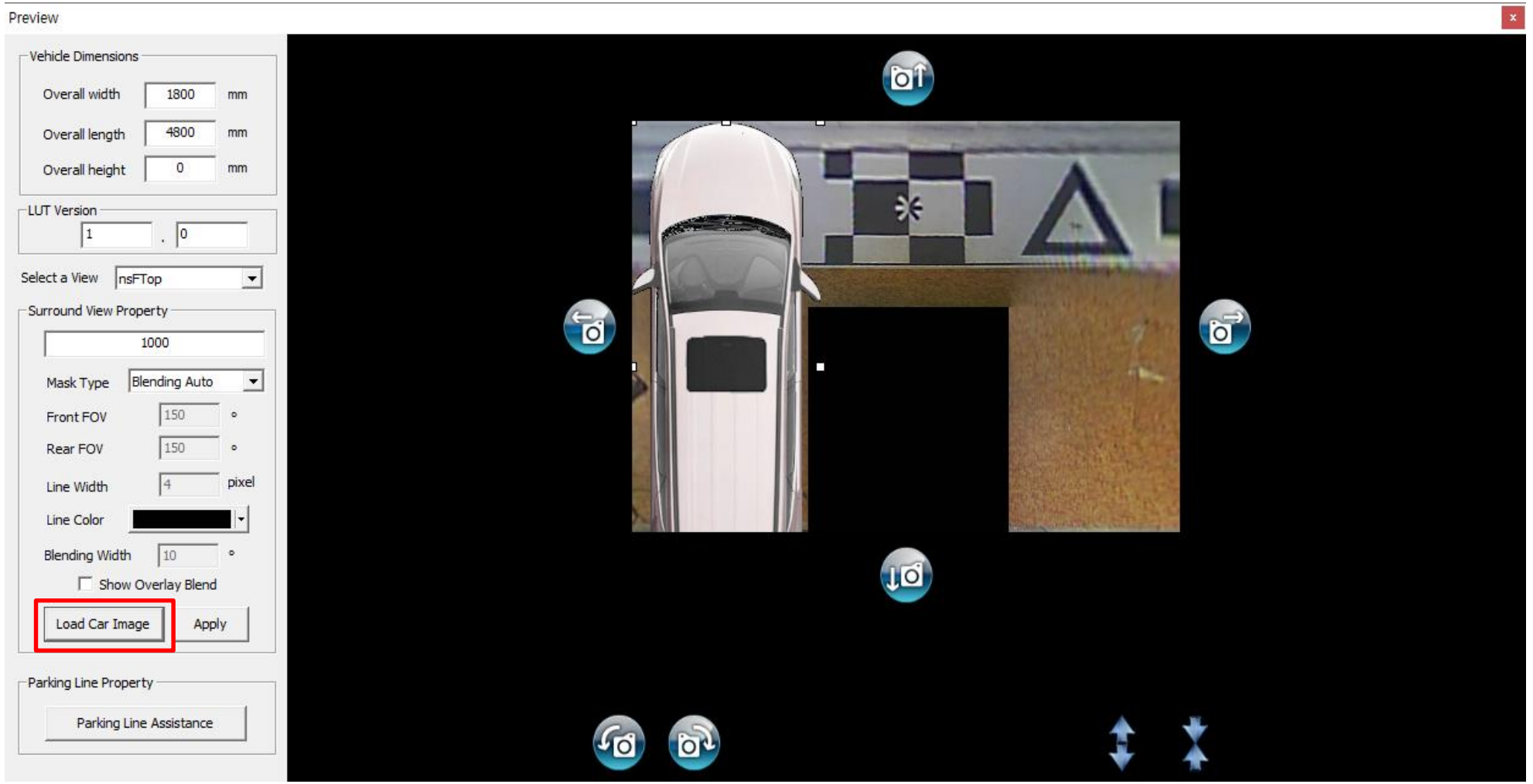
Adjust the size of vehicle image with your mouse to fit in the mask.
”Apply” button must be clicked when finished.
If another modification is needed, click “Load Car Image” and repeat the steps.



Calibration Tool

“Preview” Screen Set Up - 3. “nsFTop” View (Vertical Image)

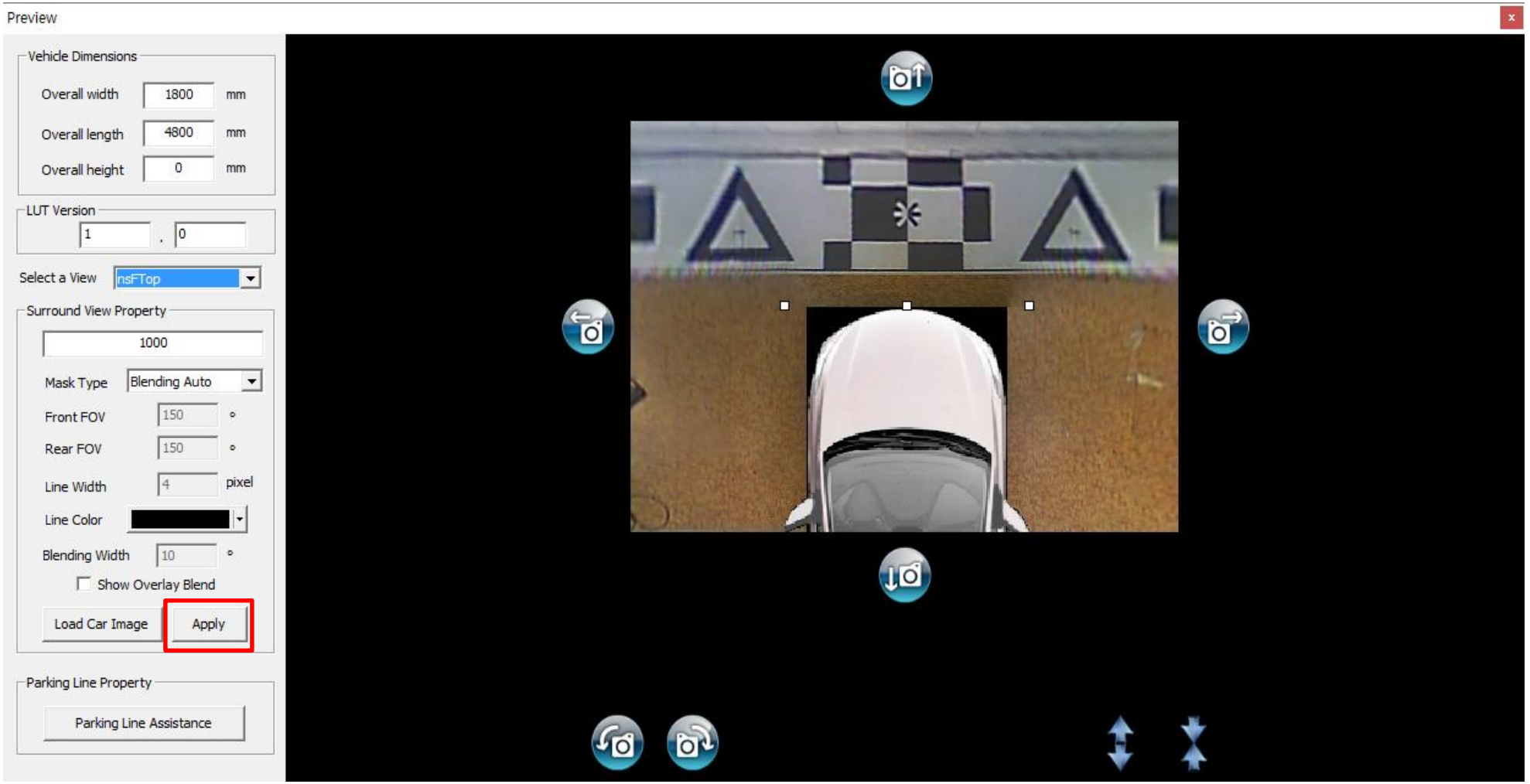
Similar to the previous view, adjust the size of vehicle image with your mouse to fit in the mask.



Calibration Tool

“Preview” Screen Set Up - 3. “nsFTop” View (Vertical Image)

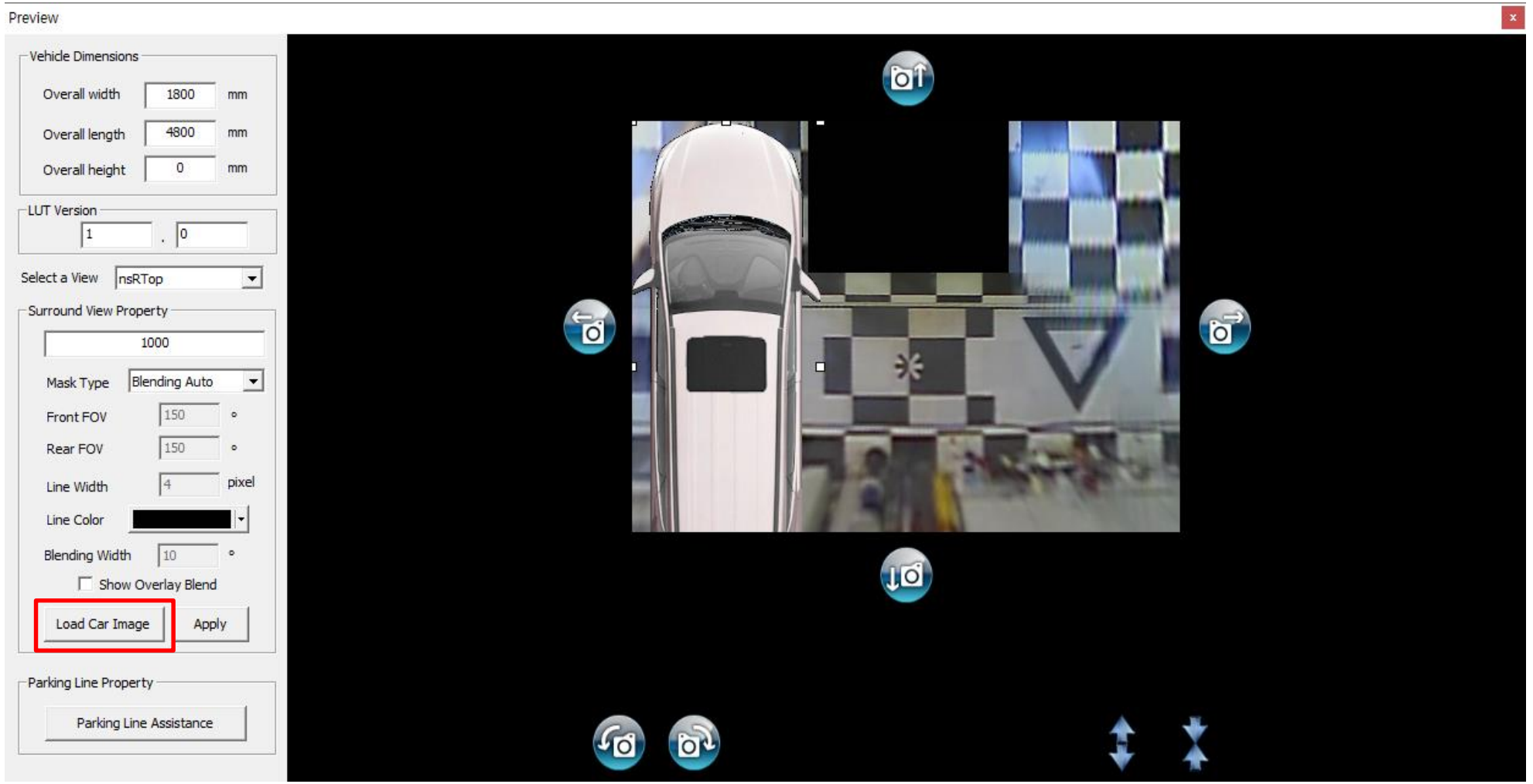
”Apply” button must be clicked when finished.
If another modification is needed, click “Load Car Image” and repeat the steps.



Calibration Tool

“Preview” Screen Set Up - 4. “nsRTop” View (Vertical Image)

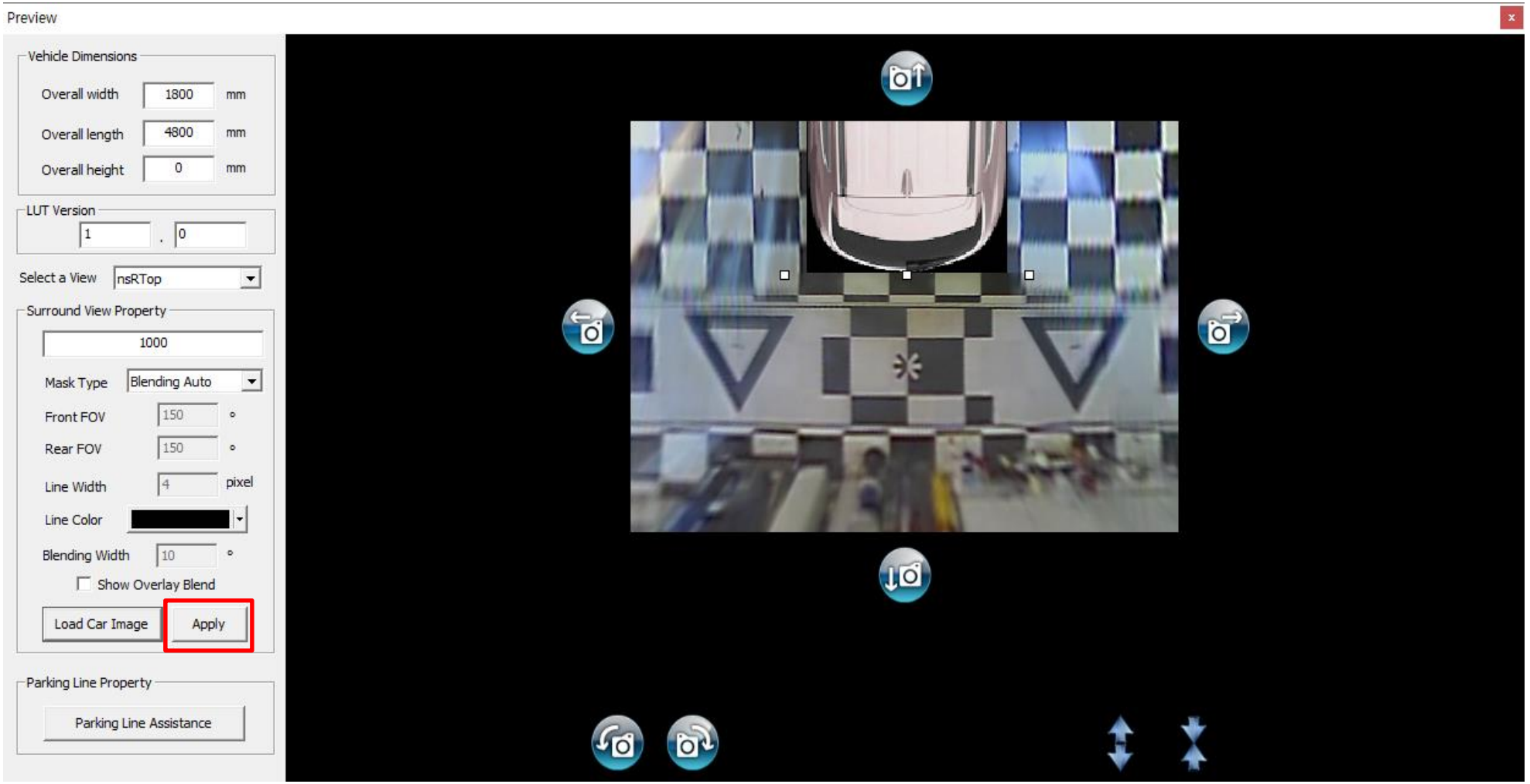
Similar to the previous view, adjust the size of vehicle image with your mouse to fit in the mask.



Calibration Tool

“Preview” Screen Set Up - 4. “nsRTop” View (Vertical Image)

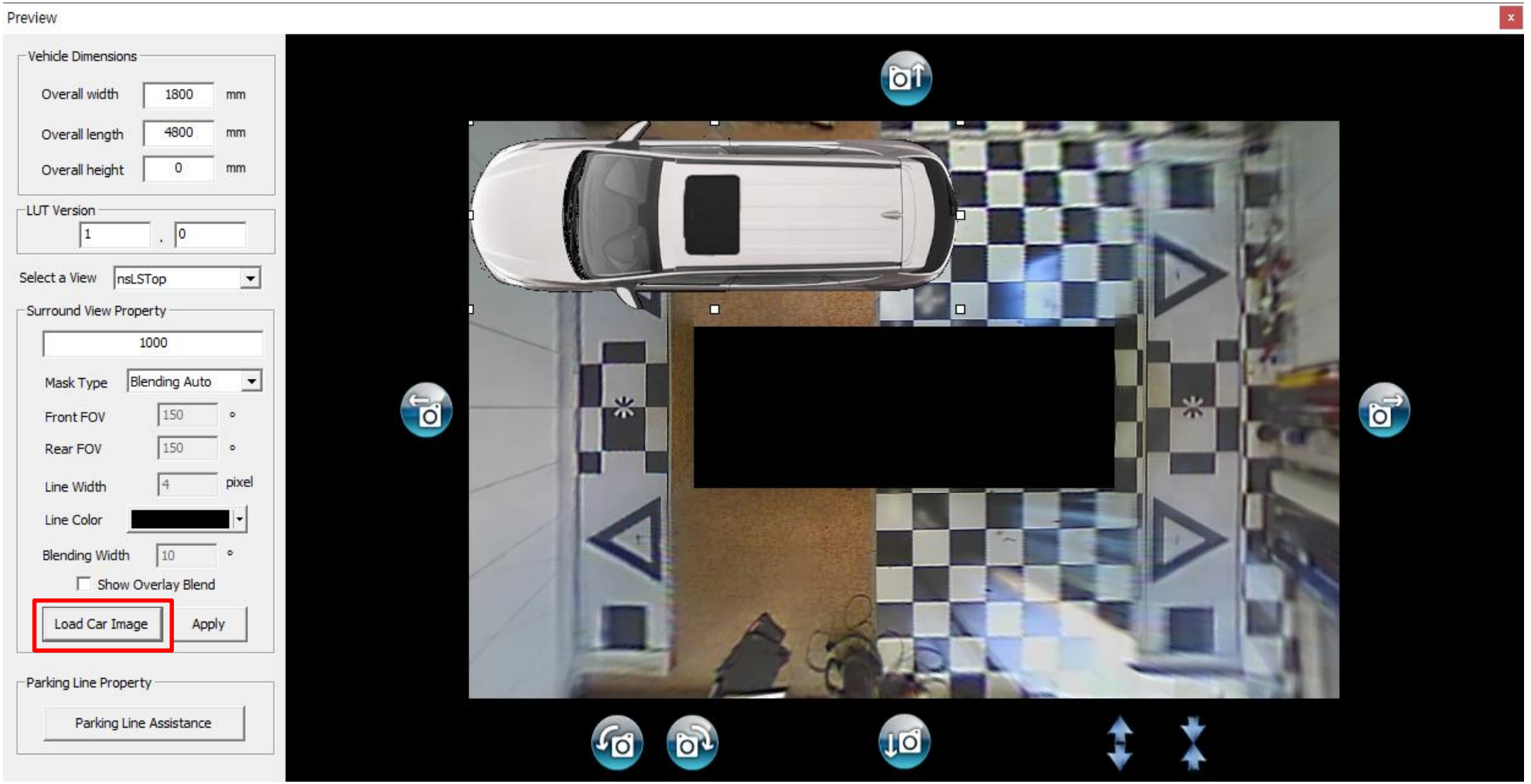
”Apply” button must be clicked when finished.
If another modification is needed, click “Load Car Image” and repeat the steps.



Calibration Tool

“Preview” Screen Set Up - 5. “nsLSTop” View (Vertical Image)

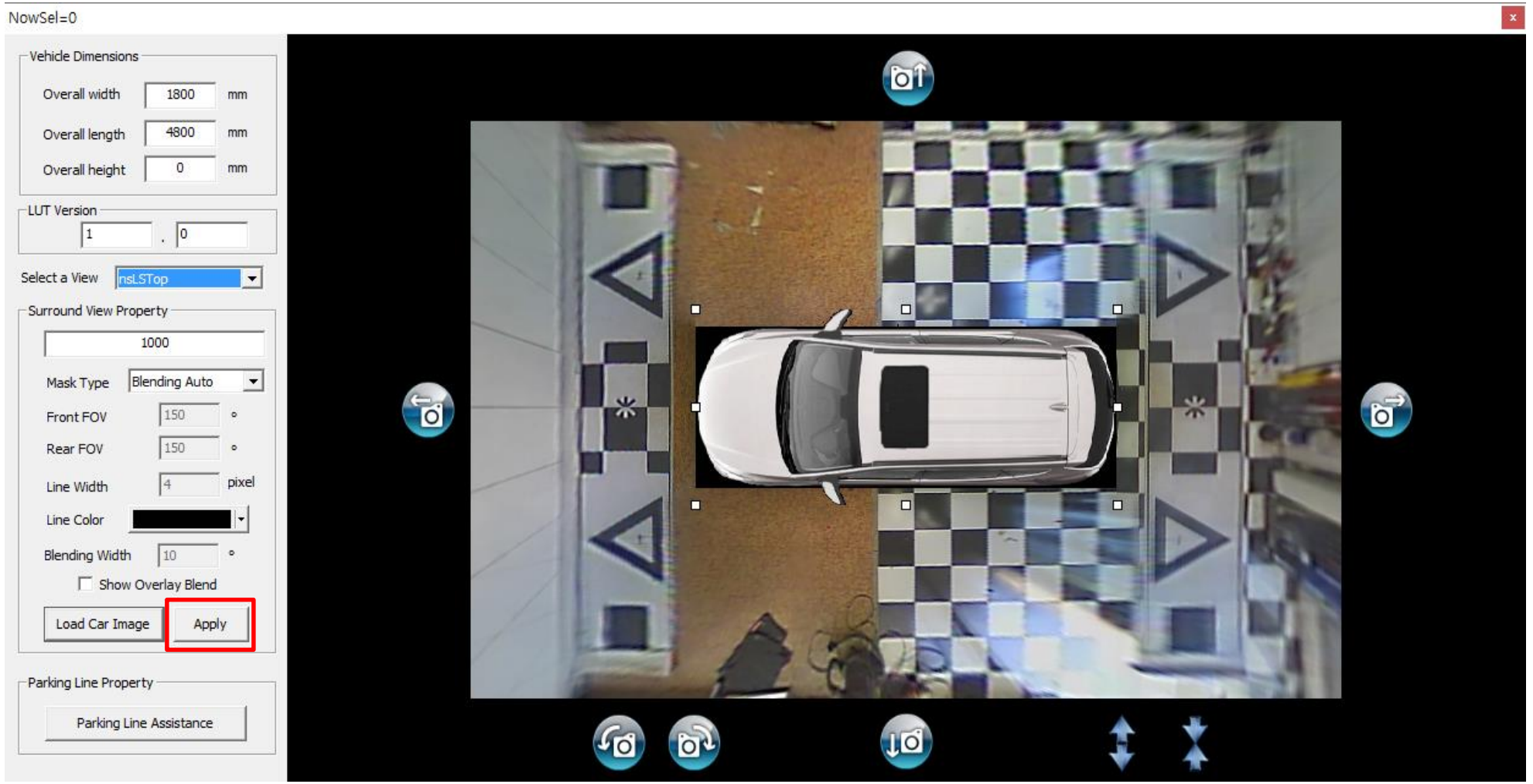
Similar to the previous view, adjust the size of vehicle image with your mouse to fit in the mask.



Calibration Tool

“Preview” Screen Set Up - 5. “nsLSTop” View (Vertical Image)

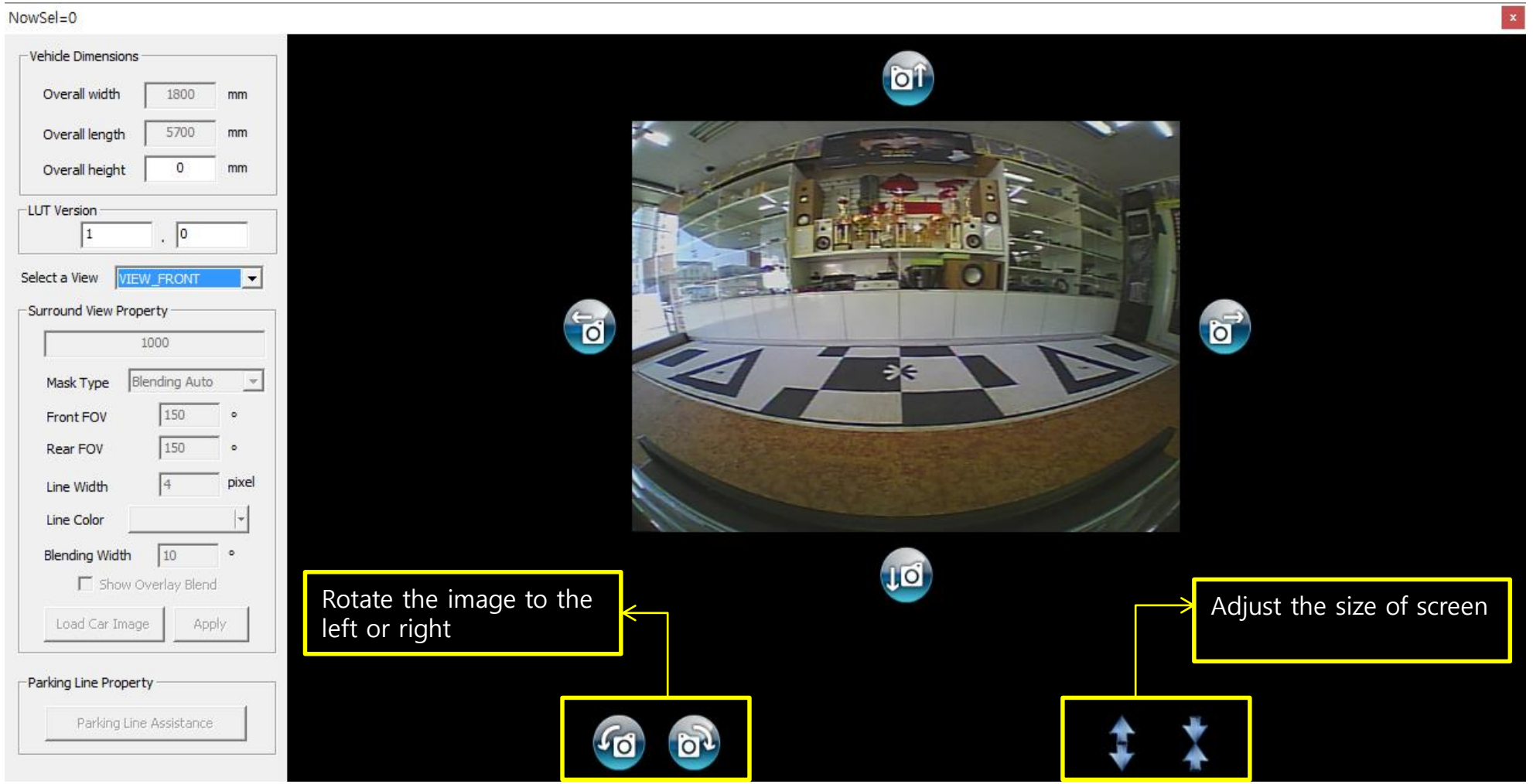
”Apply” button must be clicked when finished.
If another modification is needed, click “Load Car Image” and repeat the steps.



Calibration Tool

“Preview” Screen Set Up - 6. “VIEW_FRONT” View Adjustment

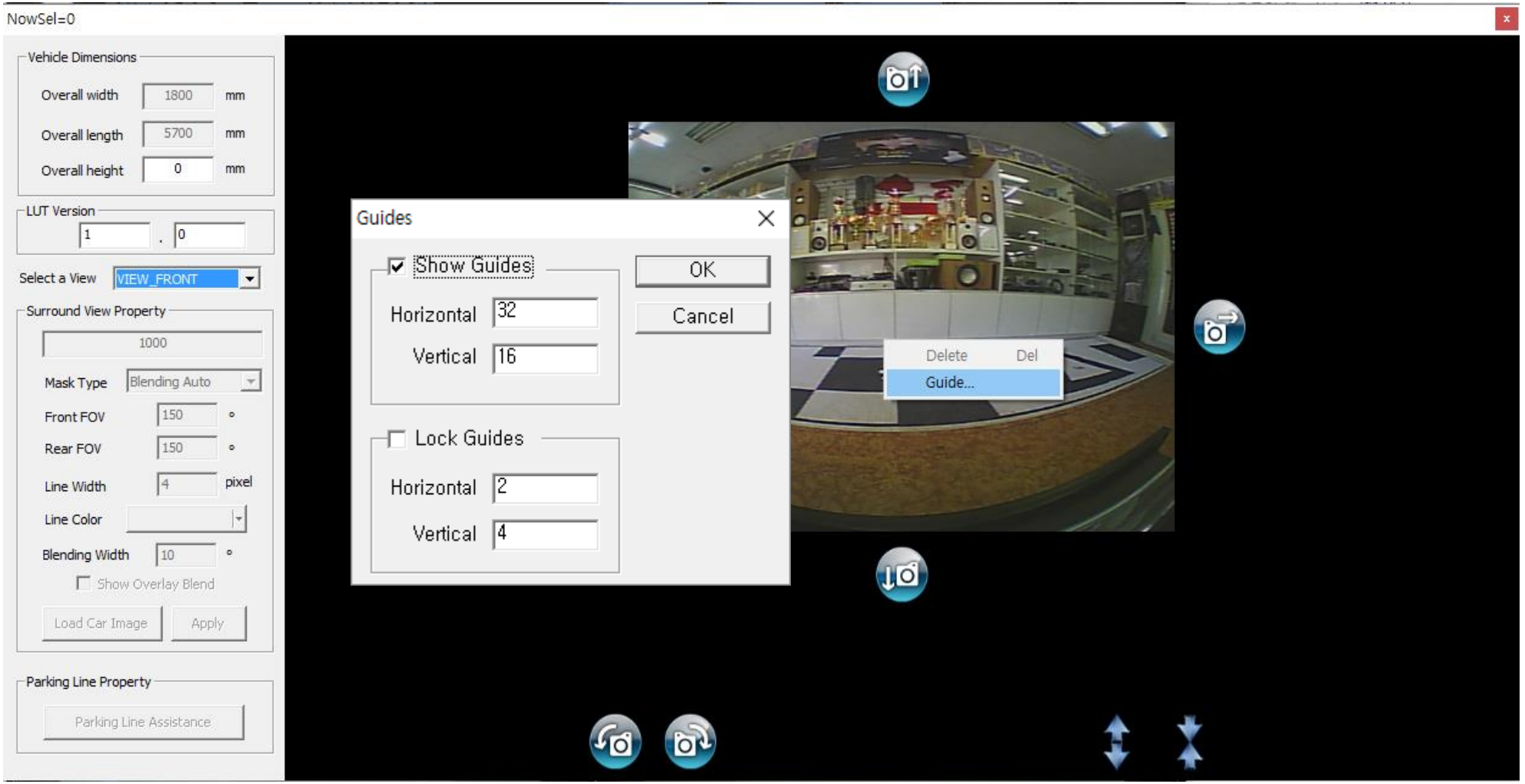
Adjust “VIEW_FRONT” view for the best look.
Set up the best view utilizing left/right/up/down arrows, rotation buttons, and zoom in/out buttons. (no need to save)



Calibration Tool

“Preview” Screen Set Up - 6. “VIEW_FRONT” View Adjustment (Displaying Guides)

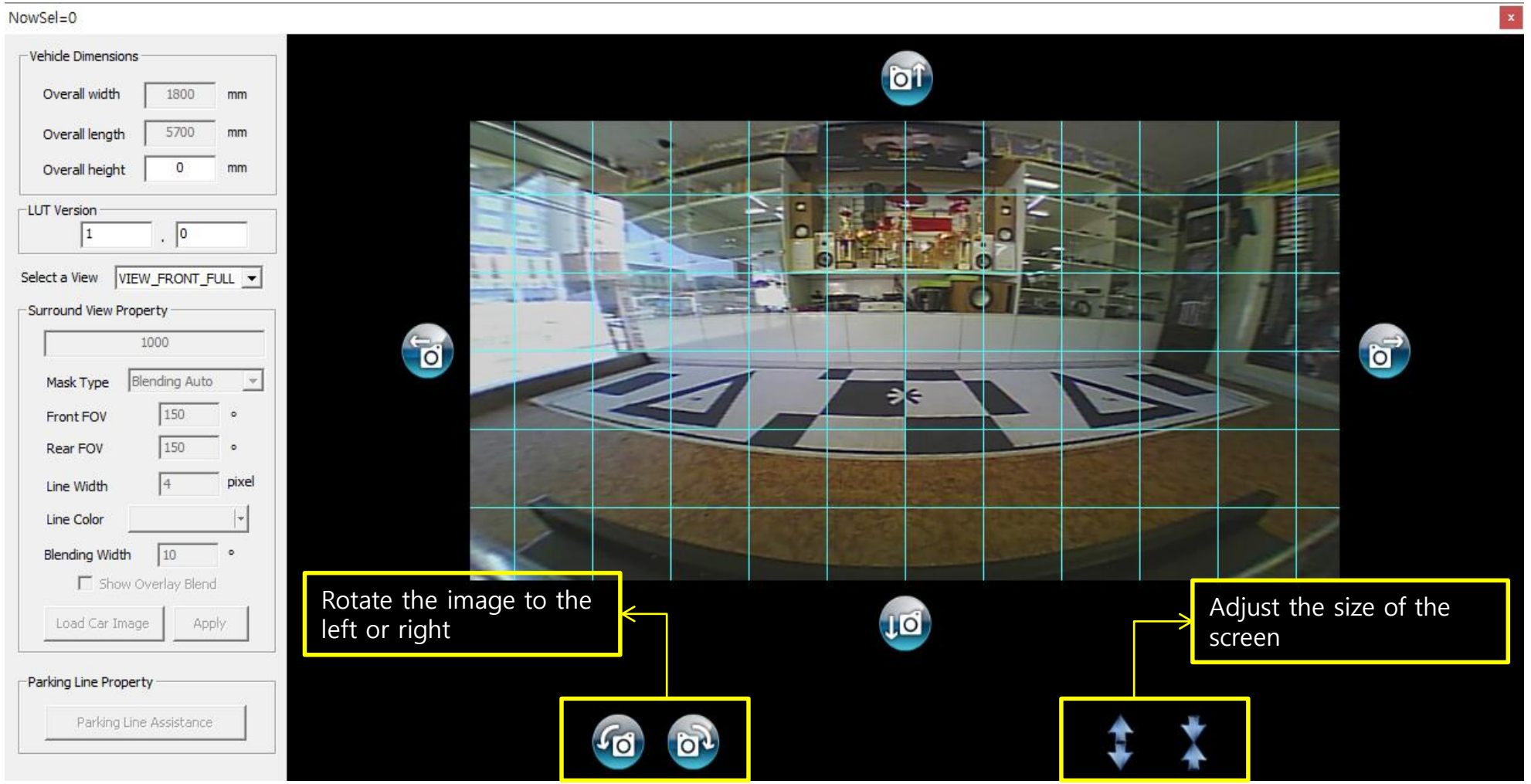
Guides can be used in order for more accurate calibration.
Guides can be selected on each view by clicking the right button on your mouse → check “Show Guides”.



Calibration Tool

“Preview” Screen Set Up - 7. “VIEW_FRONT_FULL” View Adjustment

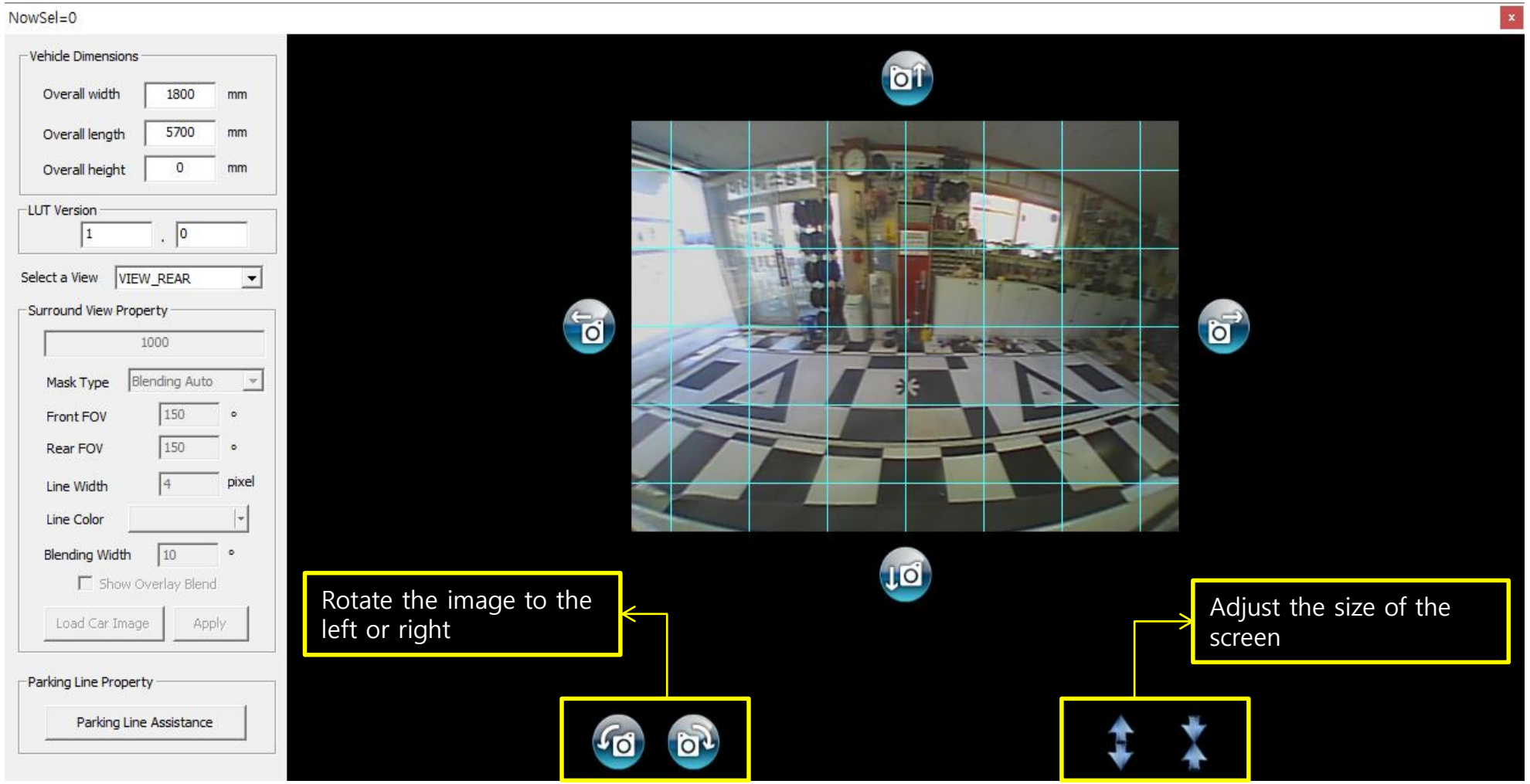
Adjust “VIEW_FRONT_FULL” view for the best look.
Set up the best view utilizing left/right/up/down arrows, rotation buttons, and zoom in/out buttons.
(no need to save)



Calibration Tool

“Preview” Screen Set Up - 8. “VIEW_REAR” View Adjustment

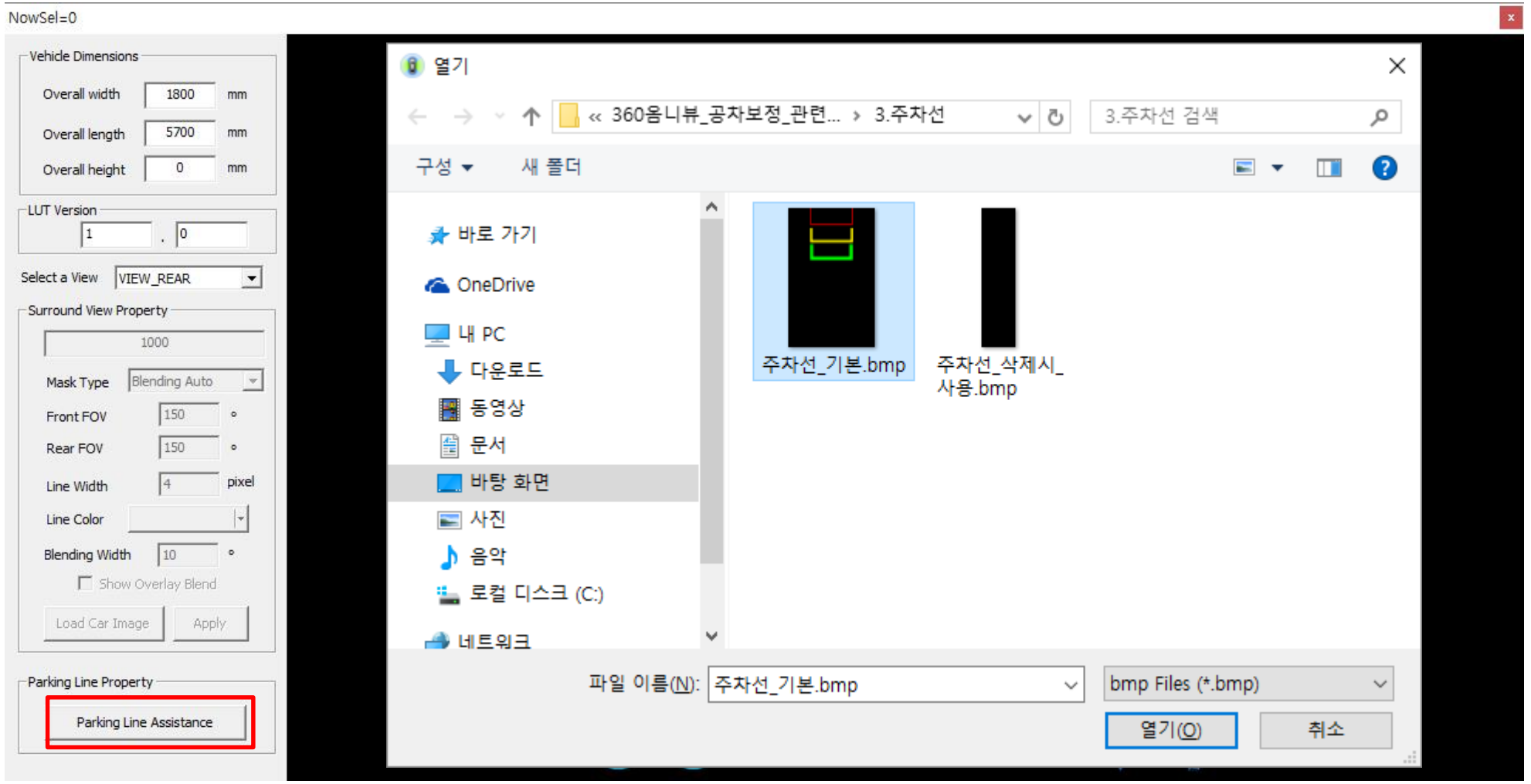
Adjust “VIEW_REAR” view for the best look.
Set up the best view utilizing left/right/up/down arrows, rotation buttons, and zoom in/out buttons.
(no need to save)



Calibration Tool

“Preview” Screen Set Up - 9. “Parking Line Assistance” in “VIEW_REAR” View

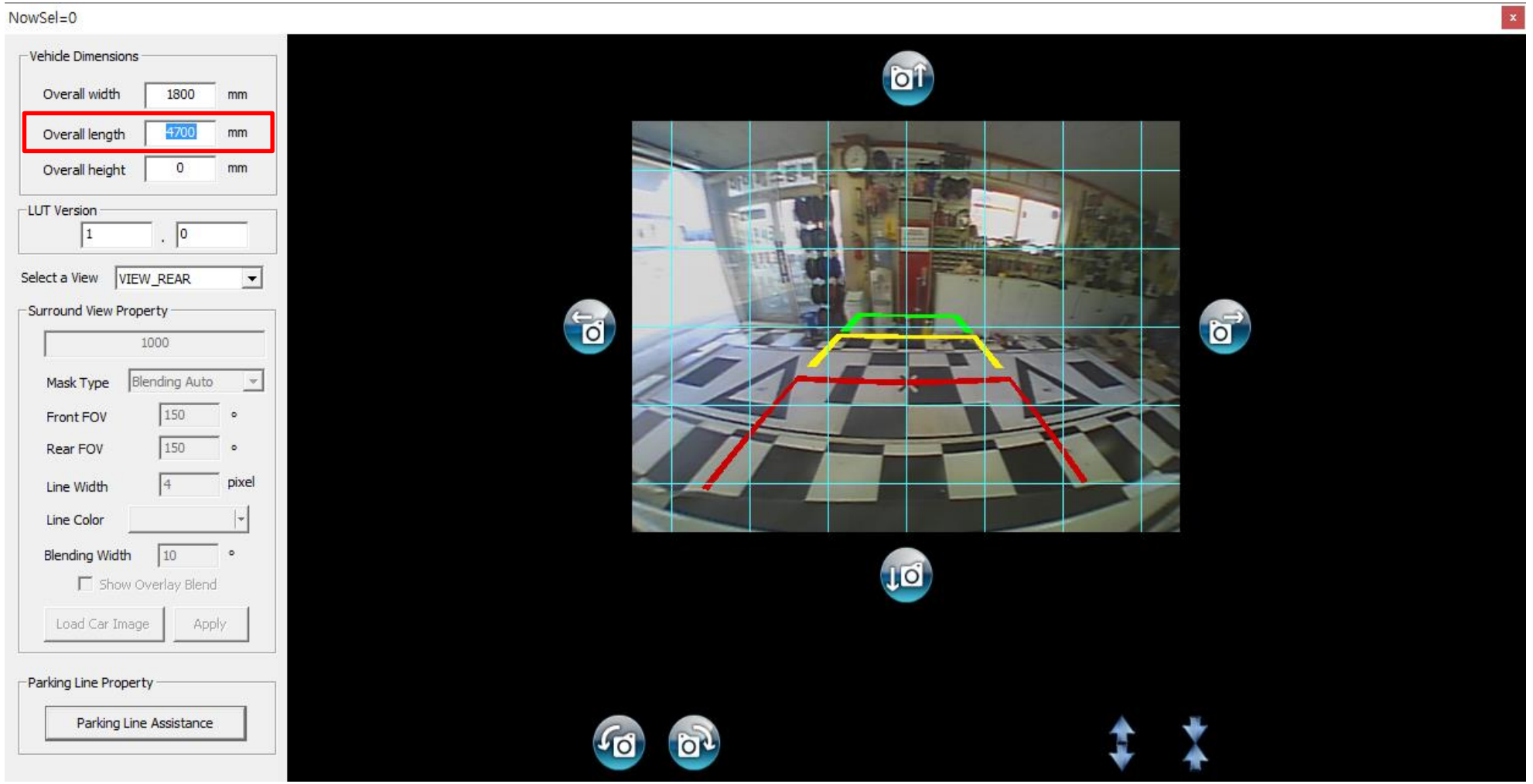
When “VIEW_REAR” view is selected, “Parking Line Assistance” button on the left bottom corner becomes active.
Then, click “Parking Line Assistance” button and load “주차선_기본.bmp” file.



Calibration Tool

“Preview” Screen Set up - 9. “Parking Line Assistance” in “VIEW_REAR” View

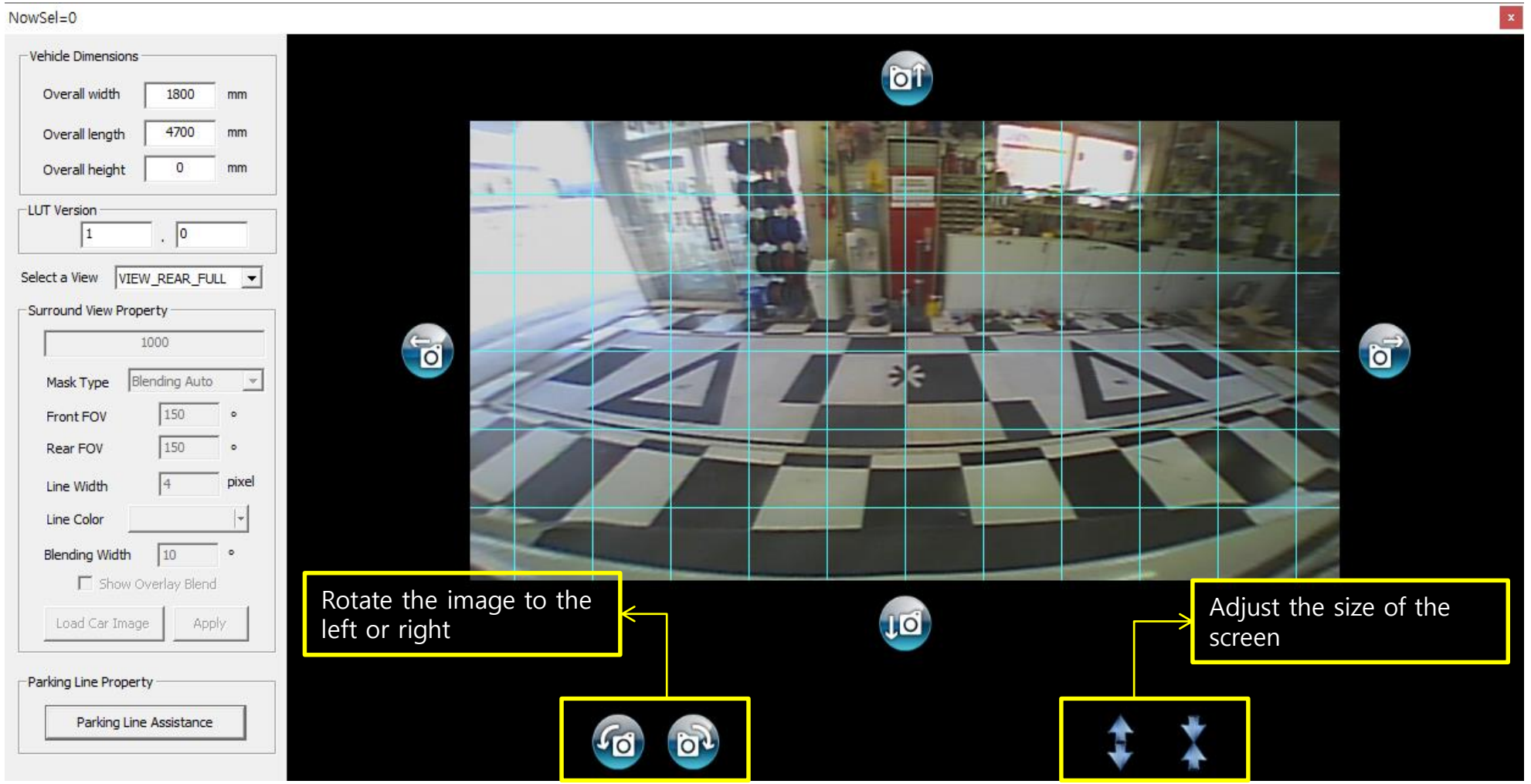
It is recommended for the parking guidance lines to start right off of the bumper.
If the parking guidance lines are too far away from the bumper, you may decrease the value in “Overall length”. (If too close from the bumper, increase the value)



Calibration Tool

“Preview” Screen Set Up - 10. “VIEW_REAR_FULL” View Adjustment

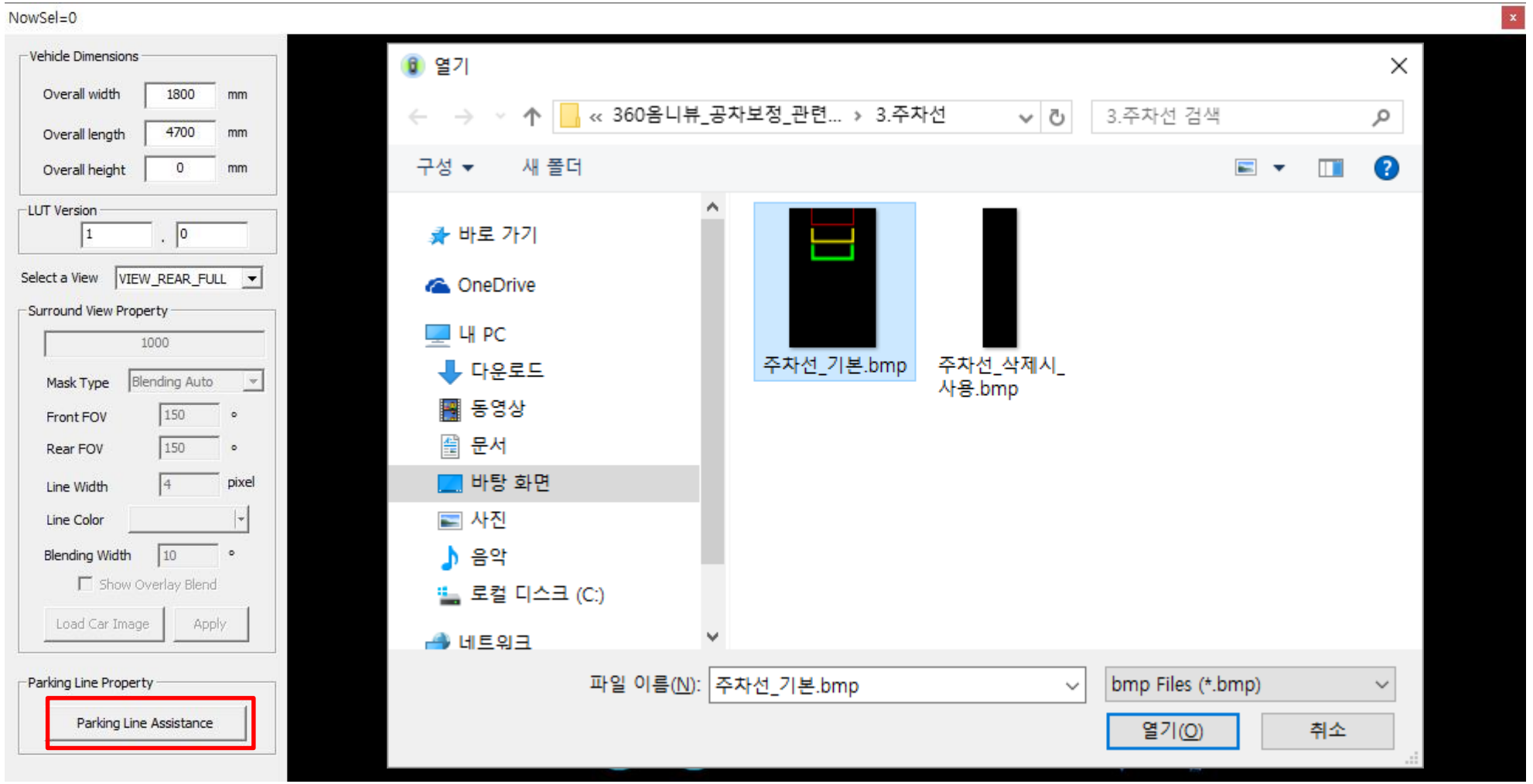
Adjust “VIEW_REAR” view for the best look.
Set up the best view utilizing left/right/up/down arrows, rotation buttons, and zoom in/out buttons.
(no need to save)



Calibration Tool

“Preview” Screen Set Up - 10. “VIEW_REAR_FULL” View Adjustment

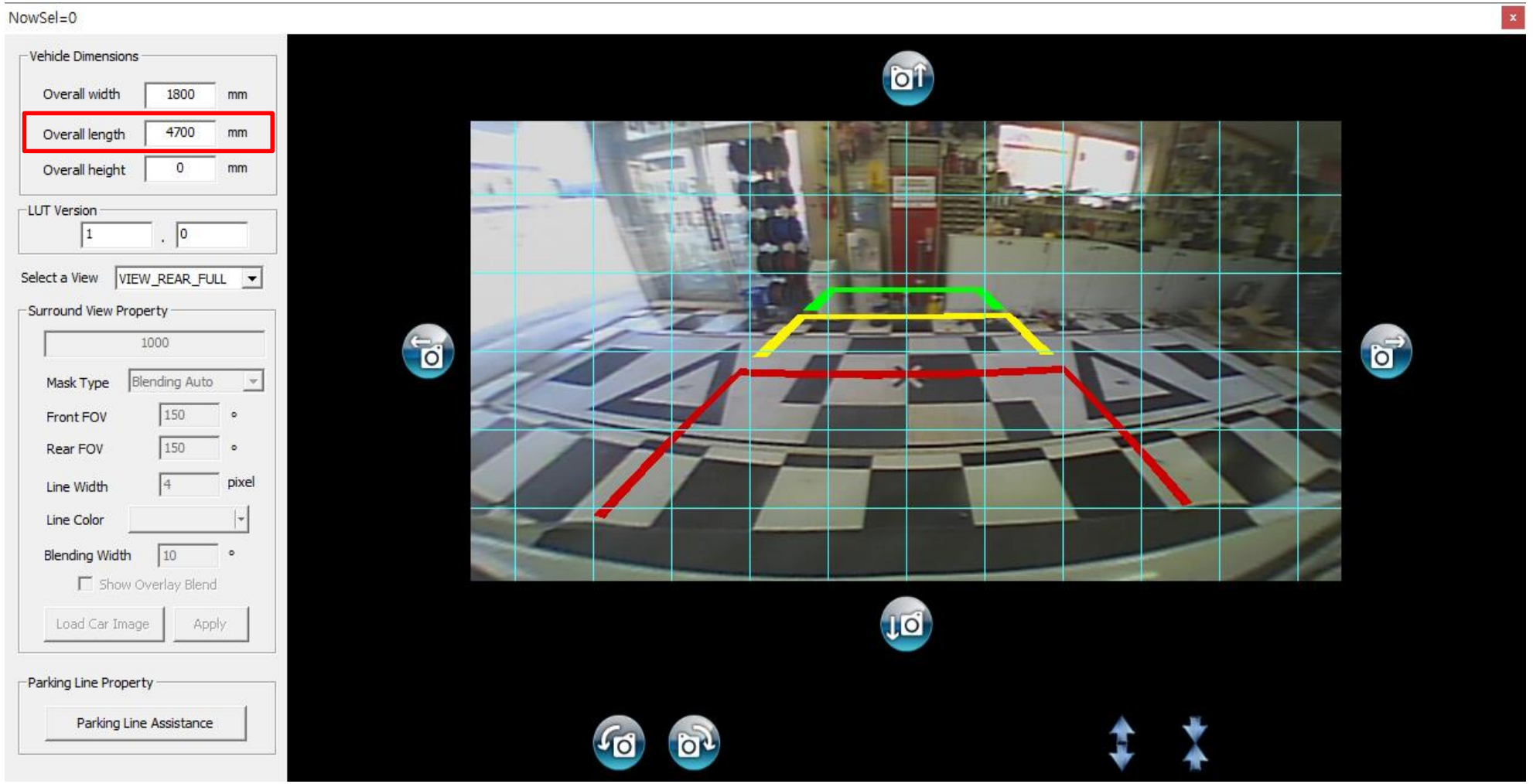
When “VIEW_REAR_FULL” view is selected, “Parking Line Assistance” button on the left bottom corner becomes active.
Then, click “Parking Line Assistance” button and load “주차선_기본.bmp” file.



Calibration Tool

“Preview” Screen Set Up - 11. “Parking Line Assistance” in “VIEW_REAR_FULL” View

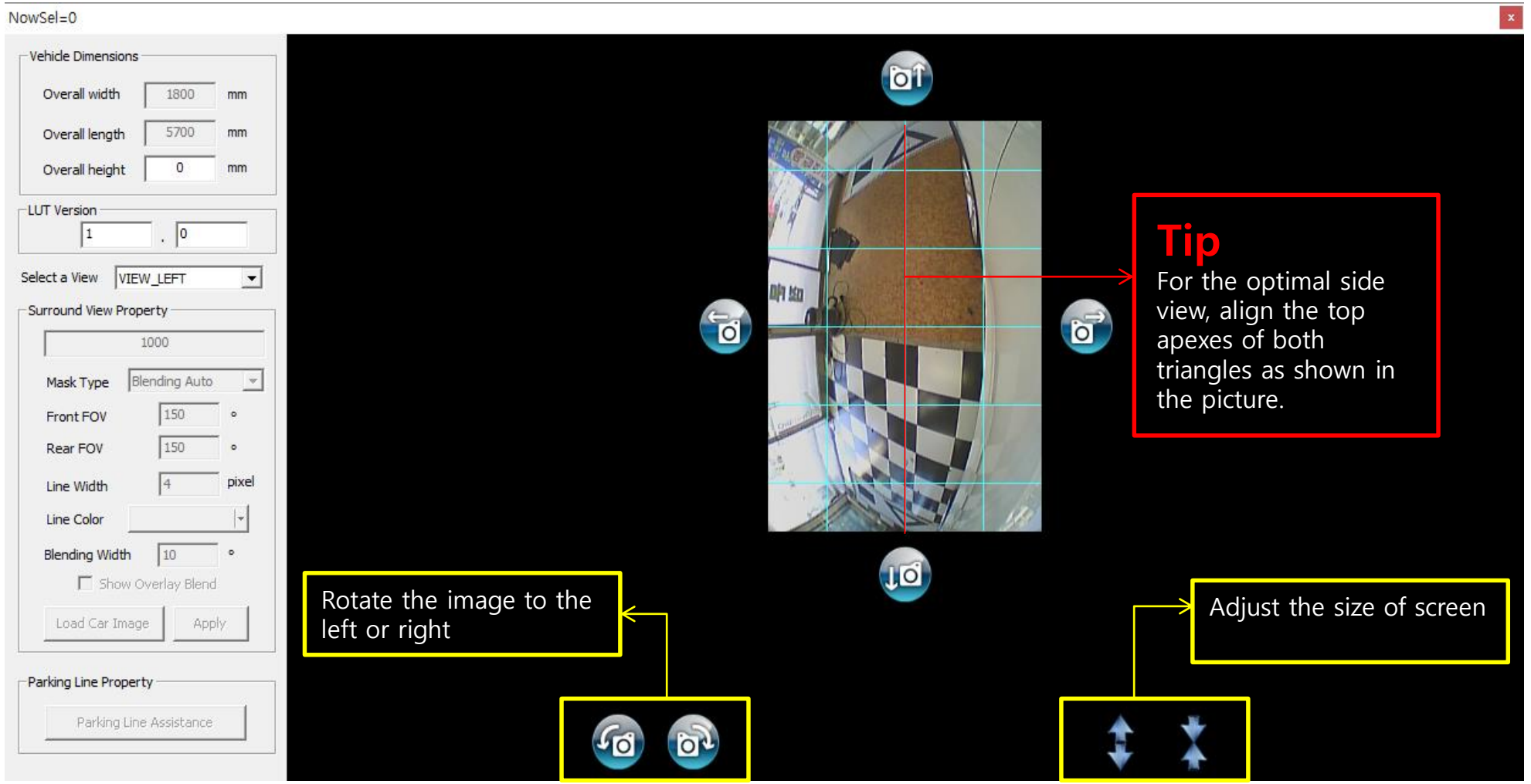
It is recommended for the parking guidance lines to start right off of the bumper.
If the parking lines are too far away from the bumper, you may decrease the value in “Overall length”. (If too close from the bumper, increase the value)



Calibration Tool

“Preview” Screen Set Up - 12. “VIEW_LEFT” View Adjustment #1

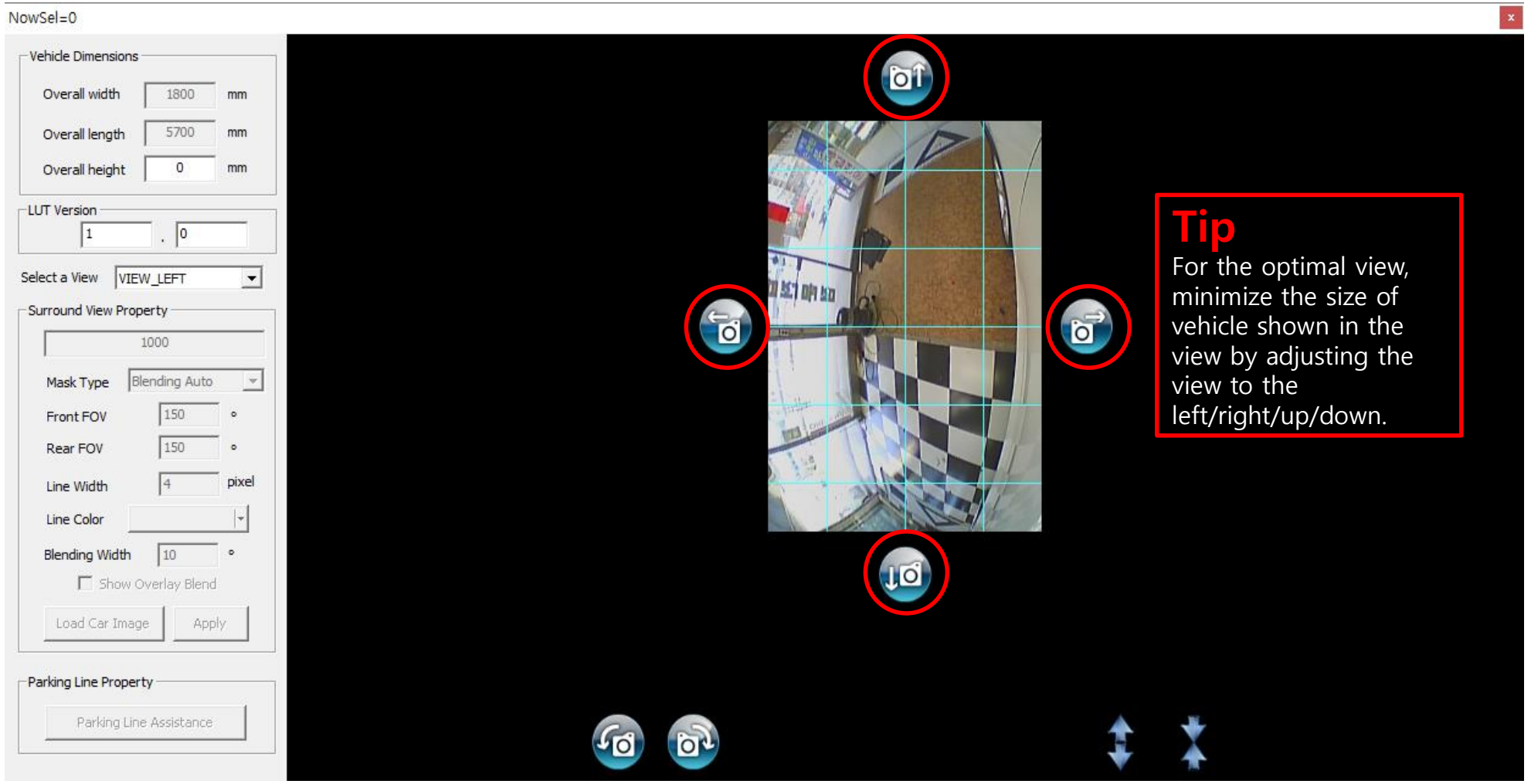
Adjust “VIEW_LEFT” view for the best look.
Set up the best view utilizing left/right/up/down arrows, rotation buttons, and zoom in/out buttons.
(no need to save)



Calibration Tool

“Preview” Screen Set Up - 12. “VIEW_LEFT” View Adjustment #2

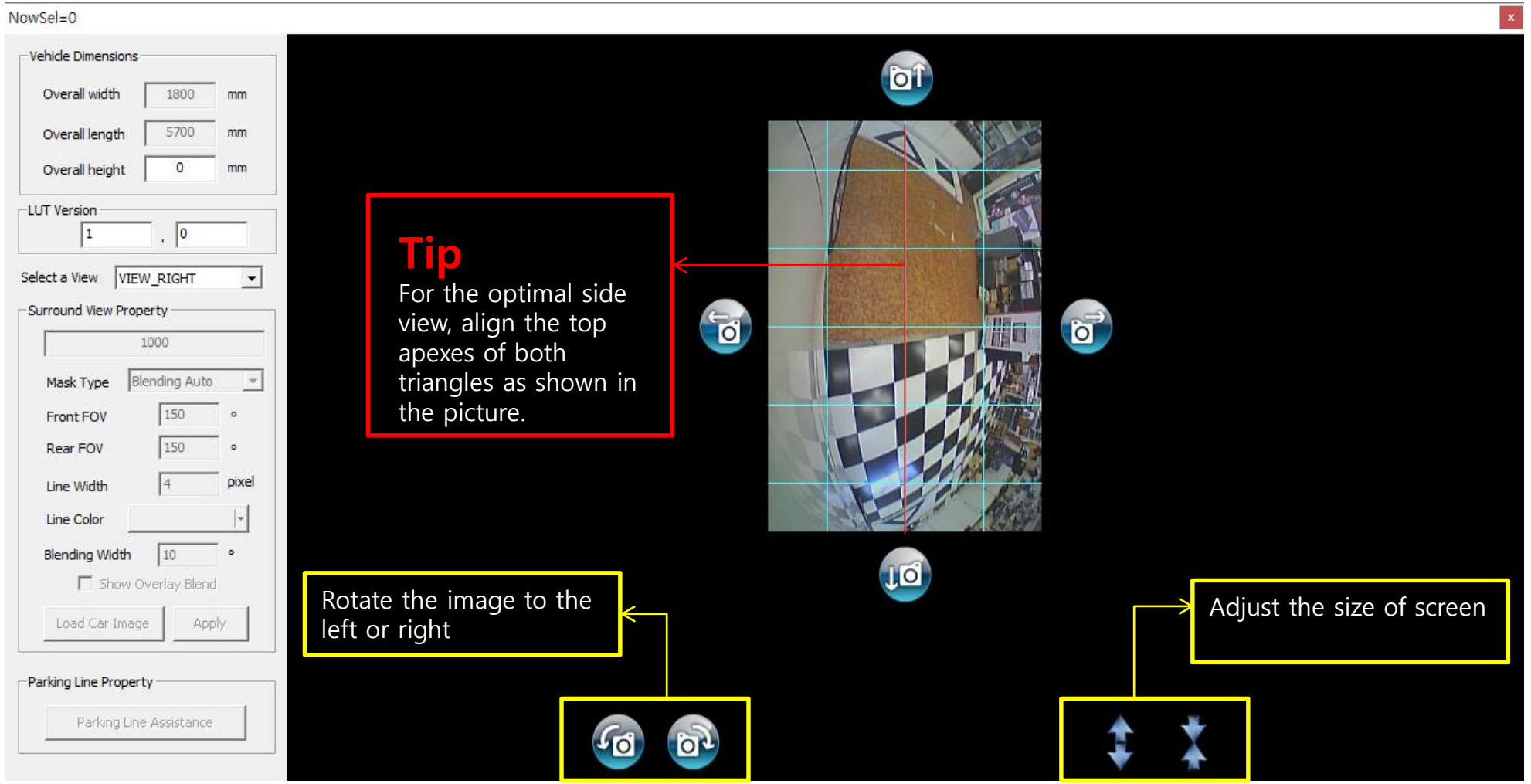
Adjust “VIEW_LEFT” view for the best look.
Set up the best view utilizing left/right/up/down arrows, rotation buttons, and zoom in/out buttons.
(no need to save)



Calibration Tool

“Preview” Screen Set Up - 13. “VIEW_RIGHT” View Adjustment #1

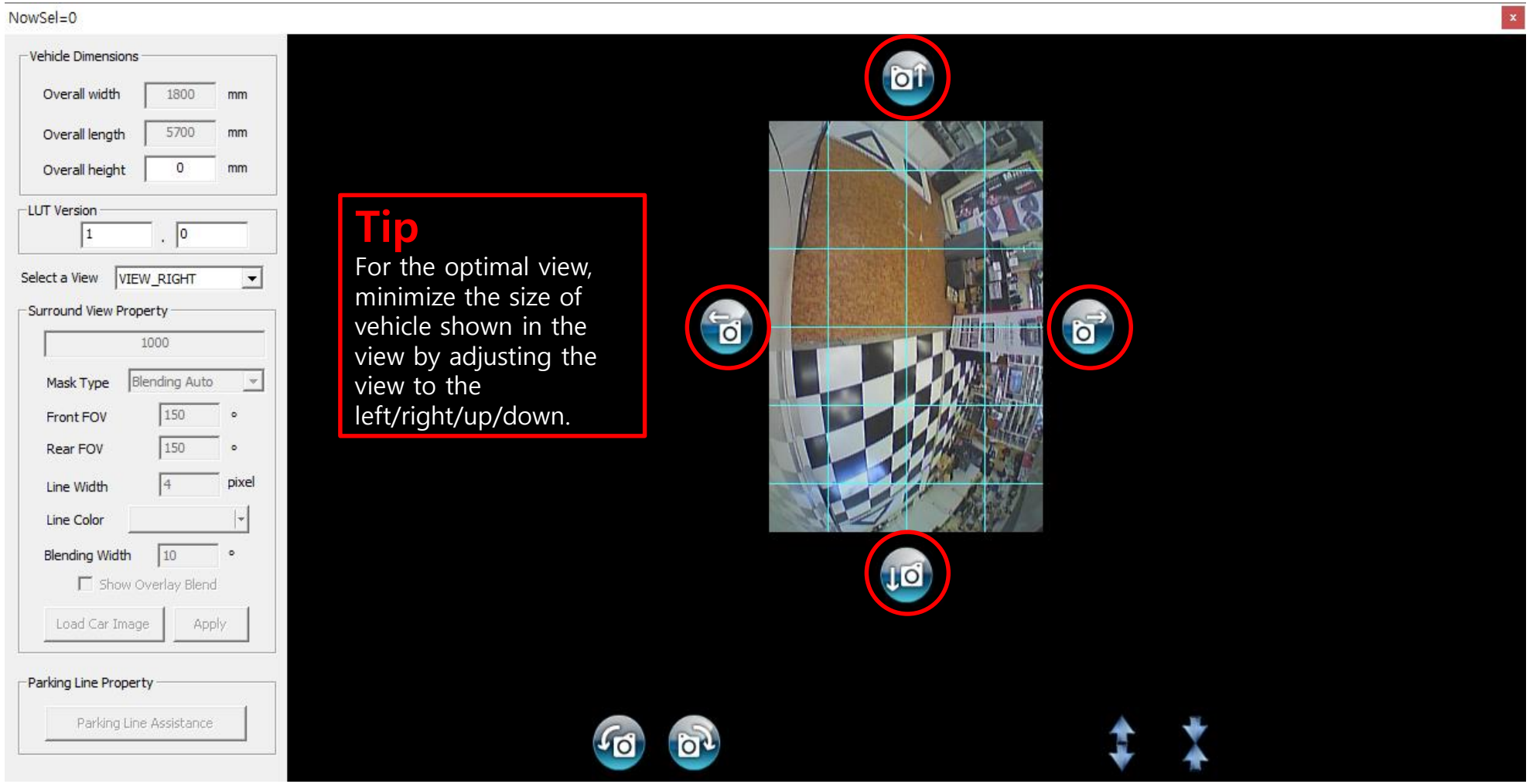
Adjust “VIEW_RIGHT” view for the best look.
Set up the best view utilizing left/right/up/down arrows, rotation buttons, and zoom in/out buttons.
(no need to save)



Calibration Tool

“Preview” Screen Set Up - 13. “VIEW_RIGHT” View Adjustment #2

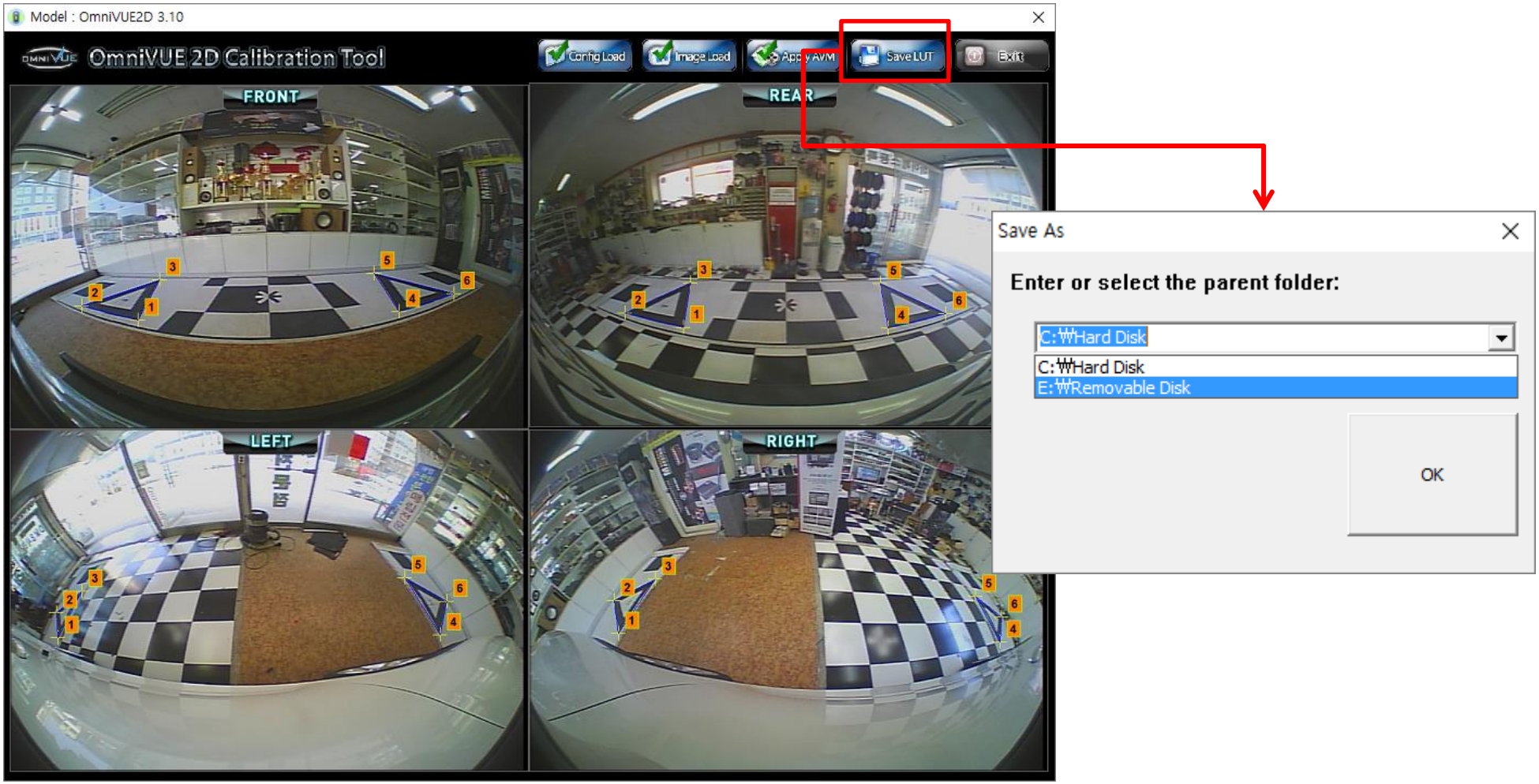
Adjust “VIEW_RIGHT” view for the best look.
Set up the best view utilizing left/right/up/down arrows, rotation buttons, and zoom in/out buttons.
(no need to save)



Calibration Tool

6

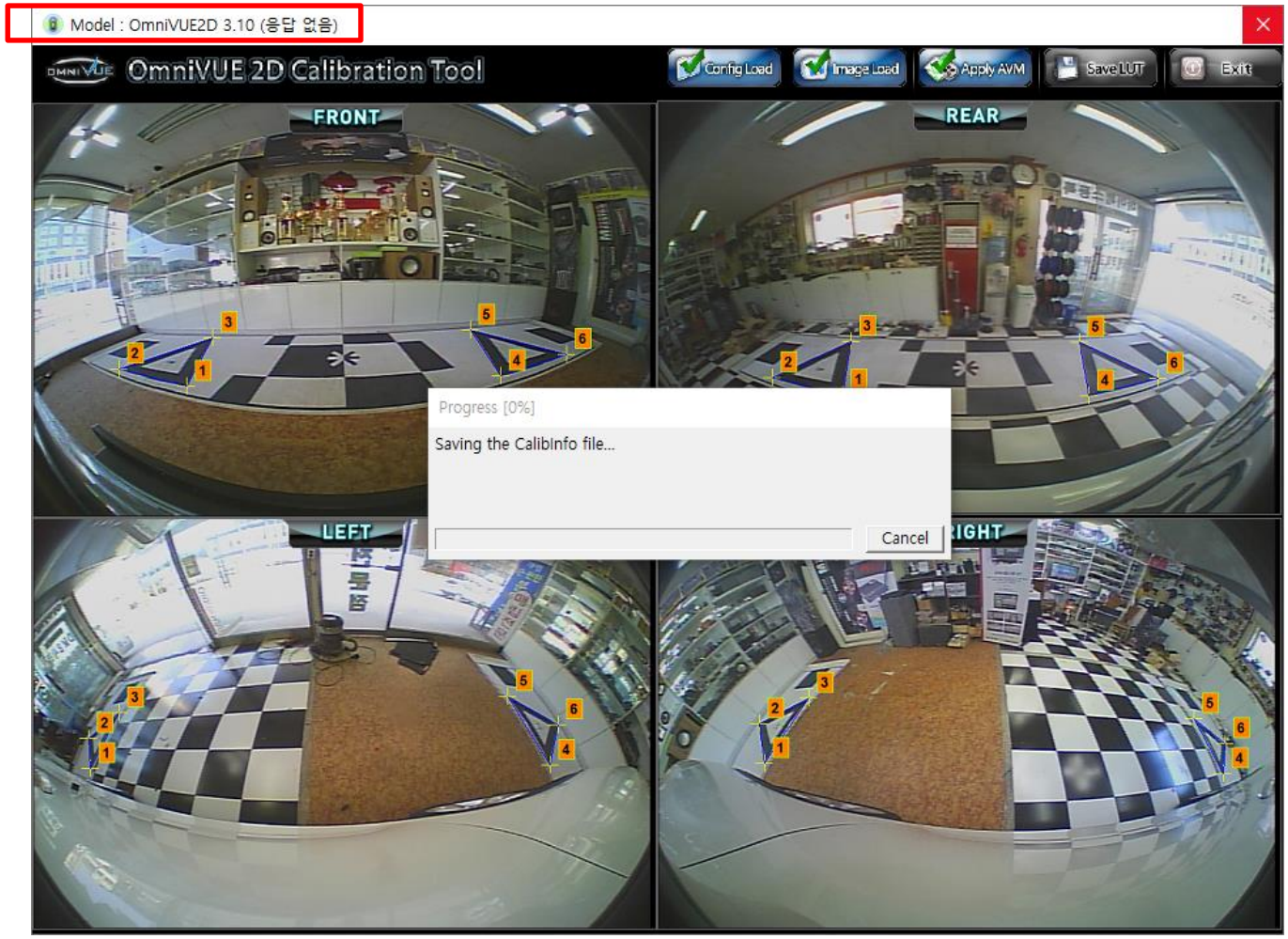
Close "Preview" screen and select "Save LUT" button from the menu. When "Save As" window pops up, select your SD card location (Removable Disk) and click OK.

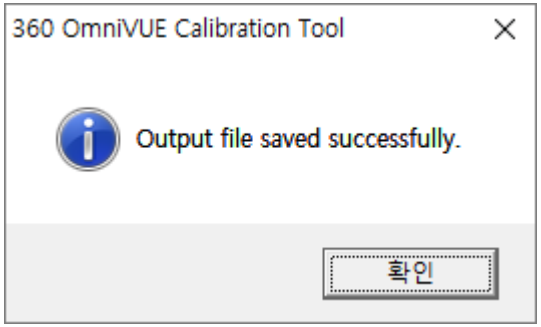


Calibration Tool

6

Depending on the PC, "No Response" warning might appear but eventually everything will be saved in a few minutes. Once finished, "Output file save successfully" message will appear.





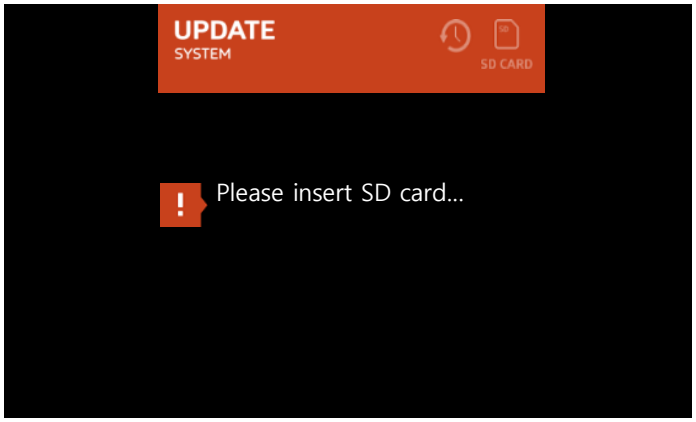
Contents

How to Update Calibration

How to Update Calibration (NS)

1

When the calibration kit is connected to the ECU, the following screen will appear:

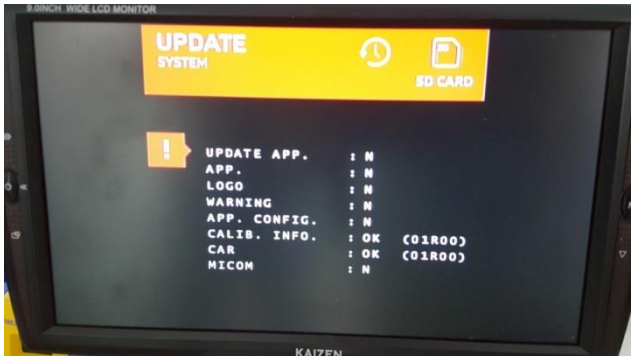


2

Insert the SD card with the complete calibration file to the calibration kit connected to the ECU then connect to the power.

3

Once the SD card is in place, the updates will start automatically. When completed, "OK" will appear for "CALIB. INFO." and "CAR" categories. Then, the SD card is safe to be removed from the calibration kit.



Information to the user.

NOTE: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

The users manual or instruction manual for an intentional or unintentional radiator shall caution the user that changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment. In cases where the manual is provided only in a form other than paper, such as on a computer disk or over the Internet, the information required by this section may be included in the manual in that alternative form, provided the user can reasonably be expected to have the capability to access information in that form.

THANK YOU

KSS-ImageNext
KEYSAFETYSYSTEMS

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