

Omnidirection Camera Series

Utility Software “ Refinder ” - Play Back Software -

User's Guide

Rev. 2.5

2018/1/17



OPT Corporation

5423-2 Miyagawa, Chino-shi, Nagano 391-0013 Japan
Tel: 0266-82-0020 Fax: 0266-82-0022

Table of Contents

1. Overview	3
2. Configuration.....	3
3. Operating Environment	3
4. Function	4
5. Outline of playback method for each recording method	5
6. Using Refinder.....	8
7. Forest Panel.....	22

About Copy Right and Trade Marks:

- The copy right of this manual is owned by OPT Corporation.
- “Refinder”, “Forest”, and “OptCamSDK” are the name of software exclusively provided to the omnidirectional camera NM33-series from OPT Corporation.
- It is prohibited to copy, reproduce, store in a retrieval system, or transmit in any form, any part or whole of this manual without the prior written permission of OPT Corporation.
- The contents of this manual are subject of change without notice.

OPT is a registered trademark of OPT Corporation.

The registered official name of Windows is Microsoft Windows Operating System.

Microsoft, Windows, Windows Vista, Windows 7, 8, 8.1 and 10 are the trademarks of USA, Microsoft Corporation. Other company names and product names described in this manual are the registered trademarks or the trade marks of each supplier.

Copyright 2008-2018 OPT Corporation, All rights reserved.

1. Overview

Refinder.exe is the software to play back and dewarp the raw (non-dewarped, Large size) video image taken by the omnidirection camera NM33 series.

This User's Guide is written for *Refinder* Ver.1.0.1.8 and later.

2. Configuration

- *Refinder.exe* ... Application software.

3. Operating Environment

PC : CPU Intel Pentium 4 or higher (including compatible CPUs.)
Memory - 768 MB or larger recommended

Your environment must allow the following OS to run properly.
Windows Vista / Windows 7, 8, 8.1 and 10

4. Function

(1) Playback the recorded file

“Refinder” plays back and dewarps the AVI or JPEG file in which the raw Hemisphere Image has been stored, and indicates the dewaped image.

File format : AVI file (M-JPEG), JPEG file
(The files recorded by “Forest”, “OptCamSDK”, and VioStor
or other NVR corresponding to the “Refinder”.)
Resolution : 1536 x 1536 pixels (Large size)

(2) Real-time input

“Refinder” can receive the raw images in real-time from the NM33 connected via USB or LAN, and indicate the dewarped image.

The Forest is required to receive images in real-time from NM33 connected via USB.

(3) Dewarping Process

“Refinder” produces dewarped images as same as NM33 does.

The View modes are selectable as same as those of NM33.

View mode : Wide / Panorama / Half Wide / Quad
Controls : Use your mouse to pan, tilt, and zoom.
Output image size : 640 x 480 (pixel)

(4) Playback control

When playback the AVI file, the following operation is possible: play / pause / designate the playback position / fast forward / backward / auto loop.

(5) others

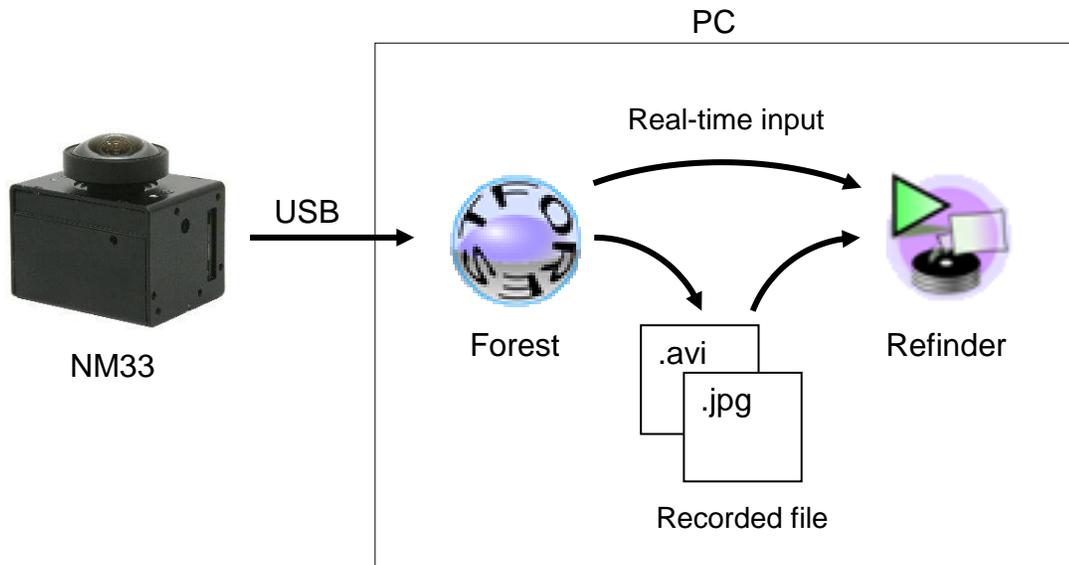
The following functions are available: storing the dewarped image, adjusting the image quality, and storing the set value.

5. Outline of playback method for each recording method

(1) In case of connecting NM33 via USB and recording into a HD of PC.

When connecting NM33 to a PC via USB, use “Forest” or “OptCamSDK” to record images into a hard disc (HD) of the PC, and open the recorded file by “Refinder”.

If proceeding the real-time input, “Refinder” will capture the image from NM33 via the Forest.



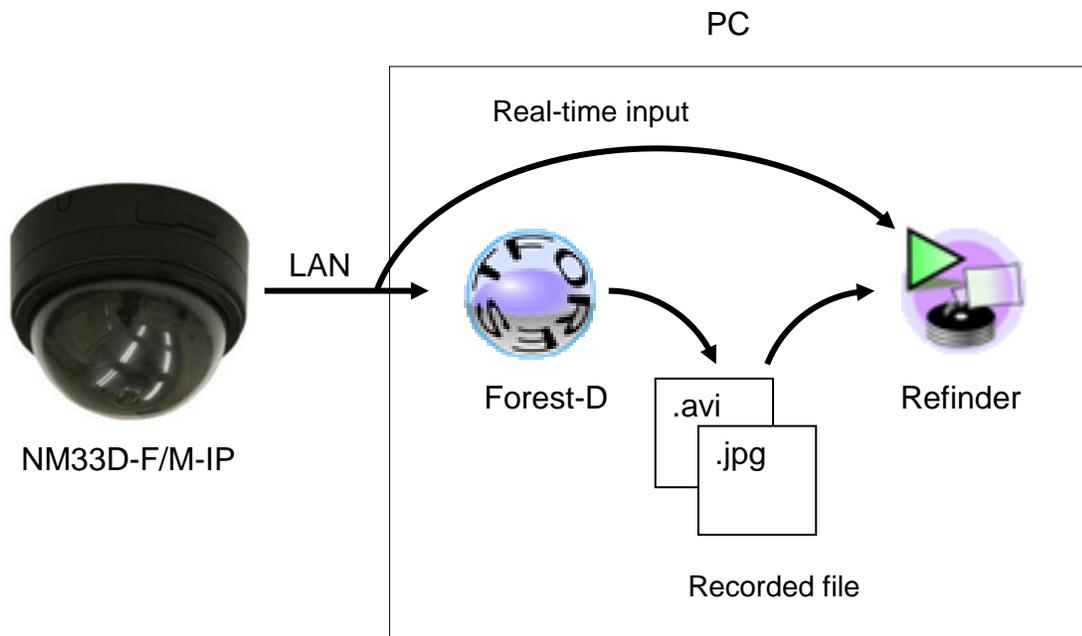
The following is the list of applications, “Forest” and “OptCamSDK”, corresponding to the version.

Name of Application	For recording file	Real-time input
Forest-D	Ver.1.0.0.0 and later	Ver.1.0.2.8 and later
Forest-N	Ver.1.0.0.0 and later	Ver.1.0.1.8 and later
Forest-OH	Ver.2.0.0.4 and later	
Forest-UH	Ver.1.0.0.4 and later	
OptCamSDK-O	Ver.0.0.1.3 and later	Non-supported (※)
OptCamSDK-U	Ver.1.0.1.3 and later	Non-supported (※)

※Note: Use the “RefinderCore” for the dewarping process in real-time by “OptCamSDK-O/U”.

(2) In case of using the IP camera like NM33D-F/M-IP and recording into a HD of PC.

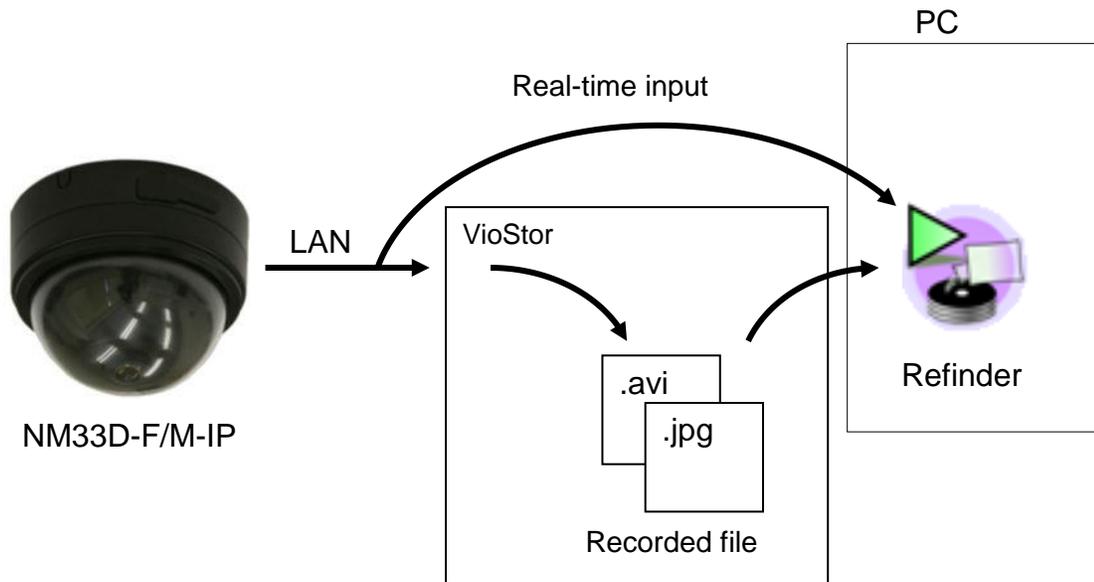
When recording the images from the IP camera like NM33D-F/M-IP into a hard disc (HD) of the PC, use “Forest-D” or “DDIPS Viewer”. “Refinder” will work to playback the recorded files. In case of the real-time input, “Refinder” will access directly to the IP camera to receive the images.



(3) In case of using the IP camera like NM33D-F/M-IP and recording by the VioStor.

The images from the IP camera like NM33D-F/M-IP will be recorded into a hard disc in the VioStor. “Refinder” will access directly to the VioStor and playback.

In case of the real-time input, “Refinder” will access directly to the IP camera to receive the images.



6. Using Refinder

6.1 Start and Stop

(1) Starting Refinder

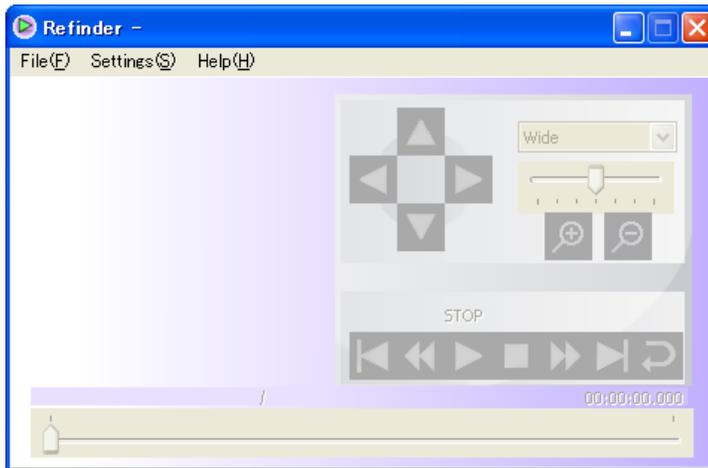
- ① Pick-up the execution file “Refinder.exe” from the CD provided with the camera and save in a voluntary folder in the PC.
- ② Double click *Refinder.exe*. The main window will open.



Refinder.exe

If you are starting “Refinder” for the first time, you can only access the menu bar.

【The window just after the first start.】



(2) Exit from Refinder

- ① To exit from the Refinder, click [File] - [Exit] or [X] in the main menu.

Note: When closing the application, the current setting value is saved in the setting file (ini file). The setting file is made in the folder as same as the execution file, [Refinder.exe]. The setting file will be loaded by the next start and the last screen condition will be revealed.

6.2 Playback the recorded file and start the real-time input.

After starting “Refinder”, select the image to be indicated.

“Refinder” can playback the recorded files stored in a PC or a VioStor, or indicate the real-time image from the camera. Please refer to the section [6.3]~[6.6] for each operation. If any image is indicated by each operation, move to the next section [6.7 **Screen Configuration**].

In case of opening the recorded files:

[6.3 How to open the recorded file stored in a HD of the PC]

[6.4 How to open the recorded file stored in a HD of the VioStor]

In case of starting the real-time input:

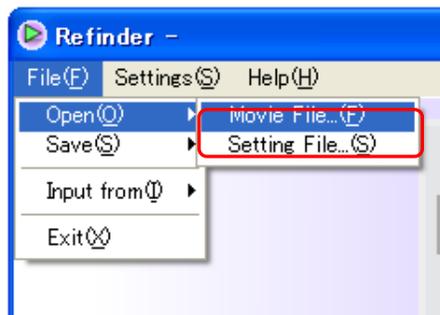
[6.5 How to execute the real-time input from NM33 connected via USB]

[6.6 How to execute the real-time input from the IP camera]

6.3 How to open the recorded file stored in a HD of the PC

The following shows the process to open the recorded file stored in a HD of the PC.

- ① Click [File] – [Open] – [Movie File..] from the menu bar.



- ② The [Open File] window appears. Select the desired AVI file or JPEG file, and click [Open]. To open a JPEG file, select [JPEG(*.jpg,*.jpeg)] in [Type of File], then select the desired JPEG file.
- ③ The selected file is loaded, the [View] window appears, and the image is indicated.

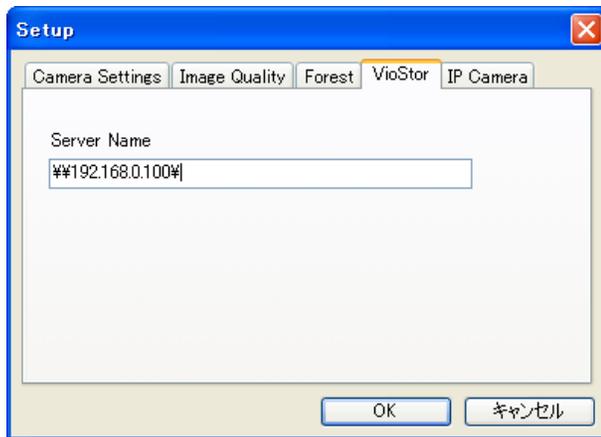
6.4 How to open the recorded file stored in a HD of the VioStor

The following shows the process to open the recorded file stored in a HD of the VioStor.

(1) Initial setting

- ① Click [Settings] – [Settings..] from the menu bar to open [VioStor] tab.
- ② Type the server name into [Server Name].

Ex) If the address of the VioStor is 192.168.0.100, type [¥¥192.168.0.100¥].



- ③ Click [OK] in the [Setup] window to close the setting window.

(2) Open the file

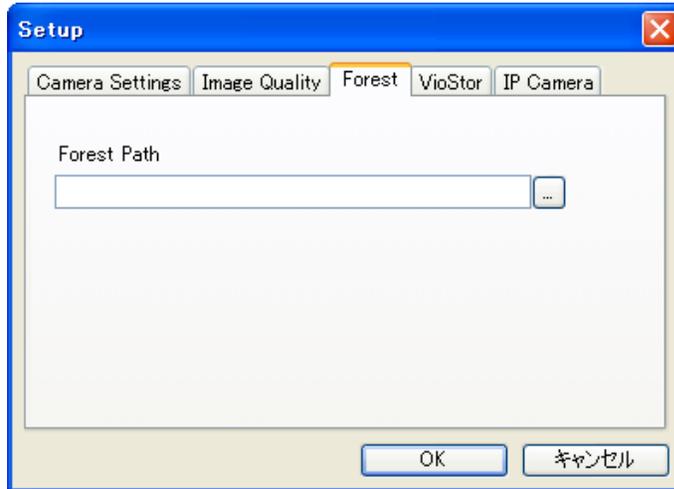
- ① Select [File] - [Open] – [VioStor] from the menu.
- ② Type [User Name] and [Password], and click [OK].
- ③ The [Open File] window will open. Select the AVI file or the JPEG file in which a raw image has been recorded, and then click [Open].
- ④ The selected file will be loaded, the [View] window will open, and the image will be indicated.

6.5 How to execute the real-time input from NM33 connected via USB

The following shows the process to execute the real-time input from NM33 connected via USB.

(1) Initial setting

- ① Install [Forest], which is corresponding to the real-time input, into a PC in advance.
- ② Click [Settings] – [Settings..] from the menu bar to open [Forest] tab.



- ③ Click [...] button to indicate the [Open File] window. Select the execution file (such as "Forest-D.exe") of "Forest", and then click [Open] button.
- ④ The path of the selected execution file is indicated in [ForestPath].
- ⑤ Click [OK] in the [Setup] window to close the setting window.

(2) Connecting the camera

- ① Connect the NM33 to the USB port of the PC.
- ② Select [File] – [Source] - [Forest] from the menu bar.
- ③ "Forest" will start with the "Refinder" unique window (Forest Panel), and receive the raw image from the NM33.



- ④ "Refinder" starts receiving the raw images from "Forest" and indicate the image.

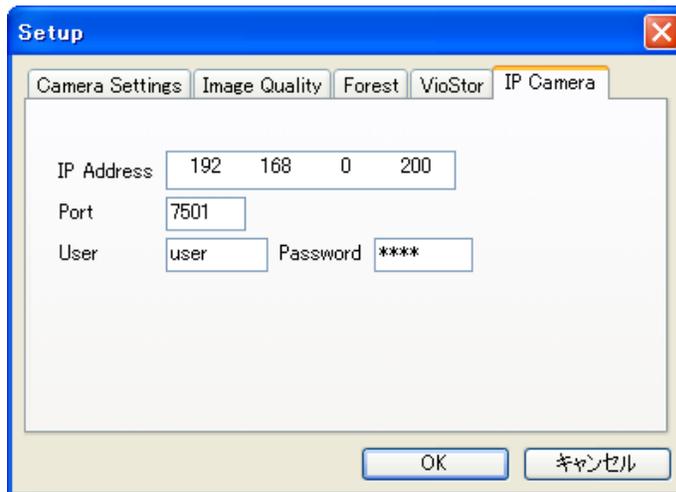
Note: For switching into the playback of files, click [File] – [Source] – [File].

6.6 How to execute the real-time input from the IP camera

The following shows the process to execute the real-time input from the IP camera such as NM33D-F/M-IP.

(1) Initial setting

- ① Click [Settings] – [Settings..] from the menu bar to open [IP Camera] tab.



- ② Type [IP Address], [Port], [User], and [Password] of the IP camera.
- ③ Click [OK] in the [Setup] window to close the setting window.

(2) Connect

- ① Select [File] – [Source] - [IP Camera] from the menu bar.
- ② “Refinder” starts receiving the raw images from the IP camera and indicate the image.

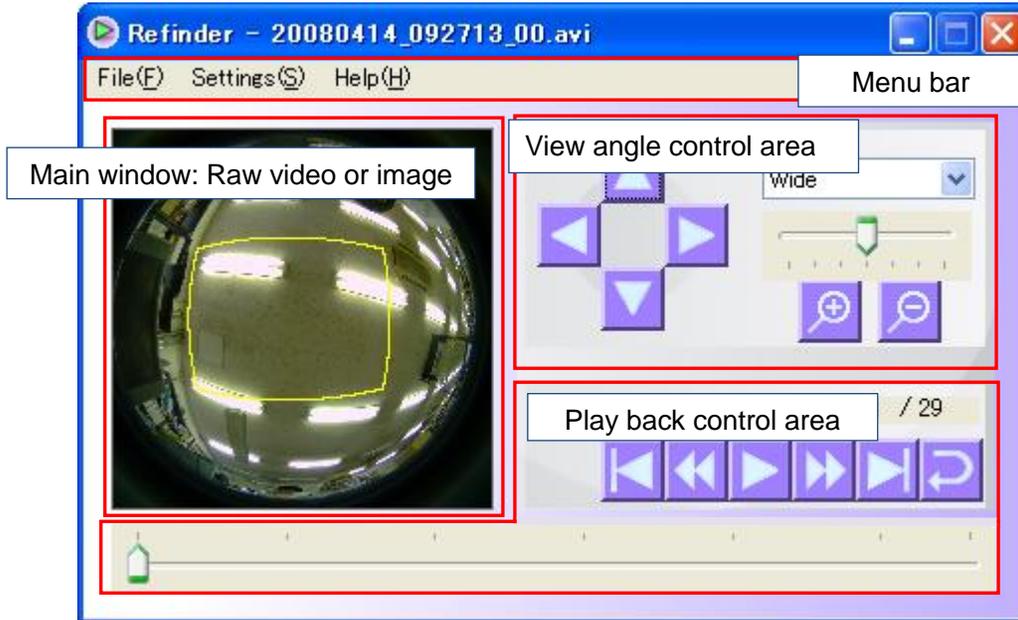
Note: For switching into the playback of files, click [File] – [Source] – [File].

6.7 Screen Configuration

When the raw image is read, the [View] window will open and the dewarped image will be indicated. Each button in the main window becomes functional.

The yellow frame indicated on the raw image in the main window is the area to be extracted and indicated in the [View] window.

【 Main Window 】



6.8 Initial setting for each camera

To set the calibration and lens data is necessary for the first start of the application or the changing of camera.

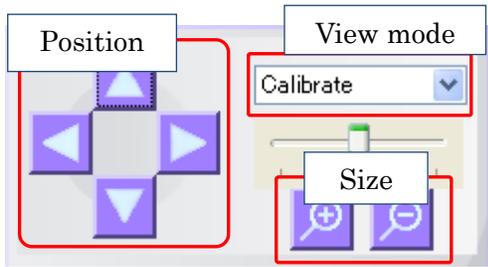
Since these setting conditions will be saved in the setting file at the closing of the application, this process is not required at the later start of the application as long as the camera is same.

(1) Calibration

Calibration is the work to adjust the position and size of the area (Select frame) in the raw image to dewarp.

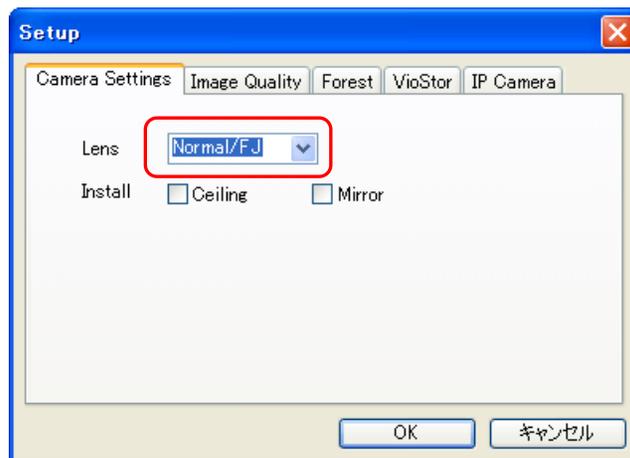
- ① Select [Calibrate] from the list box in the View angle control area.
- ② The raw image and the select frame (red ring) are indicated in the [View] window.
- ③ Adjust the position of the select frame to the center of the raw image using the up/down/right/left buttons.
- ④ Adjust the size of the extracting frame using the +/- buttons.

- ⑤ After completing the setting, switch the view mode.



(2) Lens Setting

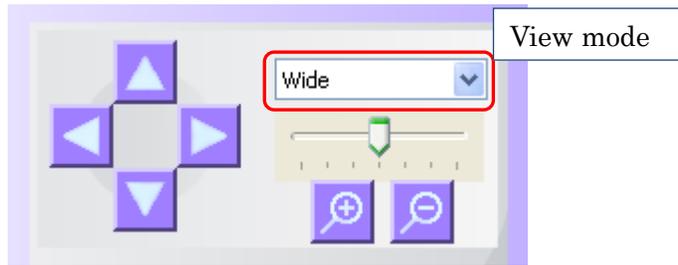
- ① Click [Settings] – [Settings..] of the menu bar to open the [Camera Settings..] tab.
- ② Select the same type of the NM33 lens from the list box of [Lens] .
- ③ Click [OK] to close the setting window.



6.9 Screen Mode

(1) Select View Mode

- ① Select the desired view mode from the list box.
- ② When you have selected a view mode, the “View” window appears. If you have closed the [View] window by the close button [x] and wish to open it again, select a view mode again.



[Available view modes]

View mode	Explanation	Name in Forest
Calibrate	Indicate the raw (non-dewarped) image in small size. To be used for the calibration.	Sub-ring
Wide	Shows video or image in “Wide” mode.	Zoom I
Panorama	Shows video or image in “Panorama” mode.	Zoom II
Half Wide	Shows video or image in “Half Wide” mode.	Half Wide
Quad	Shows video or image in “Quad” mode.	Quad Mode

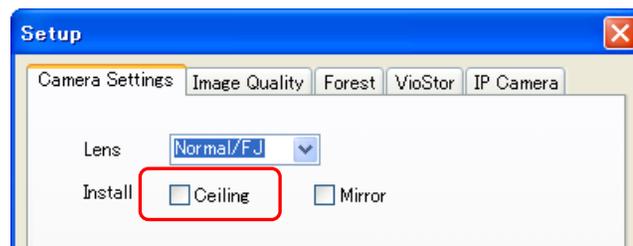
Note: [Wide] is the view mode suitable when placing the camera with its optical axis in horizontal direction.

Note: [Panorama], [Half Wide] and [Quad] are the view modes suitable when placing the camera with its optical axis in vertical direction.

(2) Desktop, Under-ceiling setting

If selecting [Panorama], [Half Wide] or [Quad], select the desktop or the under-ceiling position.

- ① Click [Settings] – [Settings..] of the menu bar to open the [Camera Settings..] tab.
- ② Checking [Ceiling] selects the under-ceiling position and remove checking selects the desktop position.

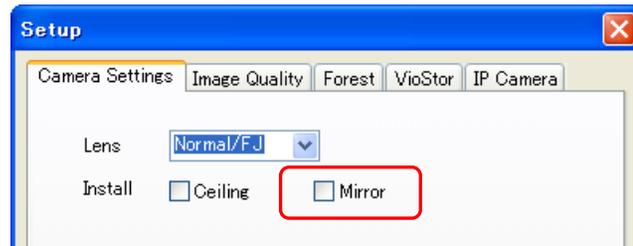


- ③ Click the [OK] button to close the setting window.

(3) Horizontal flip

With all the view modes except the [Calibrate] mode, it is possible to horizontally flip the image.

- ① Click [Settings] – [Settings..] of the menu bar to open the [Camera Settings] tab.
- ② Checking [Mirror] flips (right/left turn) the image horizontally. Removing the check from [Mirror] will cancel.

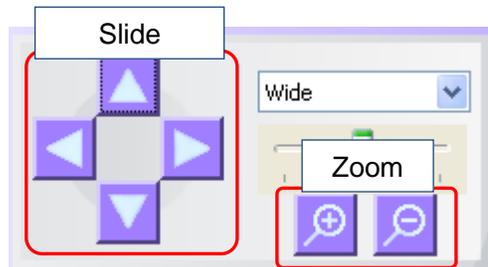


- ③ Click the [OK] button to close the setting window.

6.10 Slide and Zoom video or image

(1) Slide by the buttons in the main window

Click the Slide buttons and the Zoom buttons to change the view angle.



- | | | |
|---|---|-------------------|
|  |  | Go up and down |
|  |  | Go left and right |
|  |  | Zoom in and out |

Note that clicking the above buttons slides the video or image in the “View” window, not the raw video or image in the main window.

(2) Jump to the desired location

Click the desired location in the raw video or image. The video or image in the “View” window switches to the clicked location.

(3) Slide and Zoom in the [View] window

You can slide and zoom the video or image directly in the “View” window, with the focus on the ”View” window.

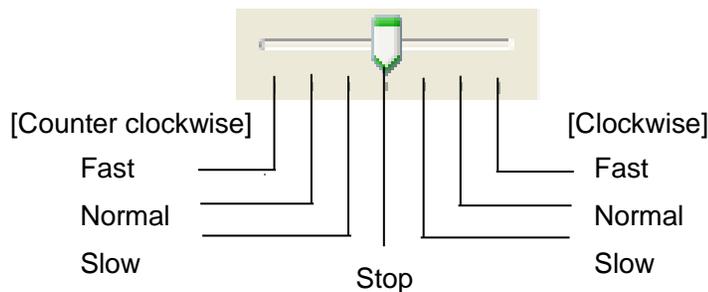
Drag by the mouse... Click anywhere in the “View” window and drag with your mouse. The view will slide following your mouse.

Scroll the mouse wheel ... Scroll the mouse wheel to zoom in / out.

(4) Auto pan

Available to use when the view mode is in [Panorama], [Half Wide] or [Quad].

Three steps are available in each direction as below.



6.11 Video playback control

Control the playback of an AVI file with the [Play back control] buttons.

These buttons are activated only when you are playing back an AVI file.



Playback : to start the playback of an AVI video.



Stop : to stop the playback of the video



Backward / Fast Forward :

If pressing while stopping, playback one by one frame back or forth. If pressing during playback, the playback speed switches in order of X2 →X4 →X8 →X2. Press the Playback button for the normal speed playback.



Jump to the end or the top of the video



Auto loop : to play back repeatedly. Press again to exit this mode.

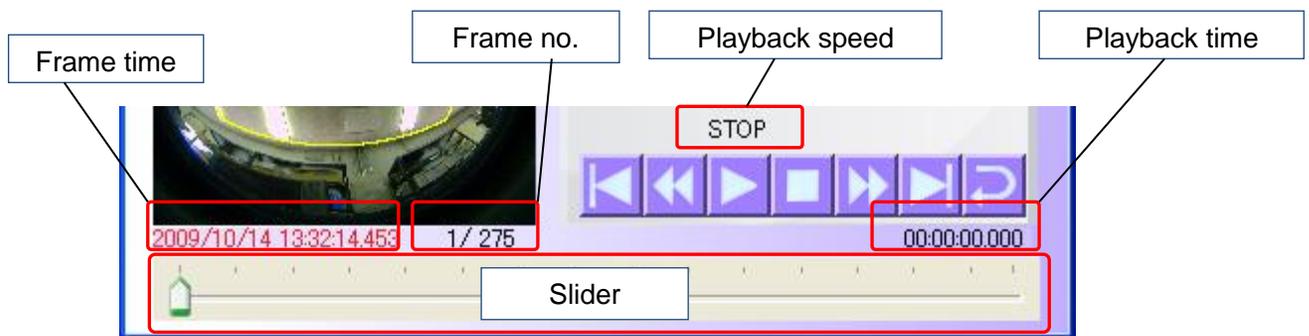
Slider : shows the present point of the video. Drag the pointer or click the desired location to jump to that point to playback.

Playback time : shows the playback point by the time from the top.

Playback speed : shows the playback speed.

Frame time : shows the time when the currently played back video was taken.

Frame no. : shows “Present frame number / All frames”.



6.12 Saving the dewarped image

It is possible to save the image in the [View] window as a JPEG file.

- ① Select [File] – [Save] – [Image] of the menu bar.
- ② The [Save as] window appears. Select the location to save, enter the file name, and save the file.

Note: The video stops if being played back.

Note: Recording during the real-time input can be done by the [Forest Panel].

6.13 Image quality setting

It is possible to adjust the sharpness and contrast of the video and image.

- ① Select [Settings] – [Settings...] to open the [Image Quality] tab.
- ② Adjust the slider of the desired item to adjust. The result is promptly reflected in the image in the [View] window.
- ③ Click [OK] to fix the setting and close the setting window.
- ④ Click [Cancel] to cancel the setting.

(1) Sharpness

To set the sharpness filter.

This setting is activated only when the “Enable” checkbox is marked.

The closer to the left the cursor is, the higher the sharpness is.

The left end is “1”, strongest and the right end is “8”, weakest.

The value is the same with the number of sharpness filter designated for the NM33.

Note : The sharpness filter works both for the raw video or image, if it is activated to the raw video or image.



(2) Contrast

To adjust the contrast.

The left end is 0 % (i.e. not adjusted). The closer to the right the cursor is, the better the contrast is.

Note : The result of the contrast adjustment differs depending on the area selected by the *Select Frame*. This is because the contrast adjustment is done based on the video or image on the [View] window.



(3) Brightness

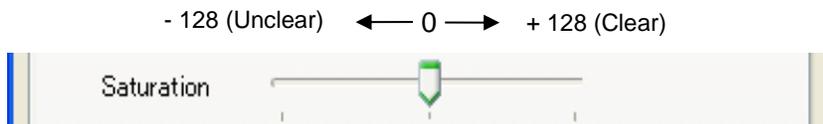
To adjust the brightness.

No adjustment is made with the cursor at the center. The closer to the right the cursor is, the brighter the video or image is.

**(4) Saturation**

To adjust the clearness.

No adjustment is made with the cursor at the center. The closer to the right the cursor is, the brighter the video or image is.

**(5) [Default] button**

To set the values back to the default values.

6.14 Save and load the settings

It is possible to save the setting information such as the calibration setting value, the name of the AVI file under playback, and the view mode into a setting file. After starting "Refinder", loading the setting file can return the application setting condition to the condition when saved.

(1) Contents to be saved

The settings that can be saved are as follows:

- The path to the AVI file and the JPEG file that is currently open
- The view mode that is currently selected
- Calibration
- The view angle (for each view mode)
- The parameters that are set in the "Setup" window.
-

- Lens type, setting position (the contents of the [Camera Settings] tab in the [Settings] window)
- Setting for the sharpness filter
- Path of [Forest]
- Server name for [VioStor]
- IP Camera setting

(2) How to save

- ① Click [File] – [Save] – [Settings...] of the menu bar.
- ② The [Save as] window appears. Enter the location to save and the file name, and click the [Save] button.

(3) How to load

- ① Select [File] – [OPen] – [Settings...] of the menu bar.
- ② The [Open file] window appears. Select the setting file and click the [Open] button.

(4) about Start and Close

When you exit “Refinder”, the setting file will be saved as the name of “Refinder.ini” in the folder where you have “Refinder.exe” file. The saved settings will be loaded when you start up “Refinder” next time.

6.15 Checking the version

To check the version of your “Refinder”, select [Help] – [About Refinder]. The following screen appears.



7. Forest Panel

7.1 Outline of the Forest Panel

The Forest panel is the window of “Forest” to be opened when executing the real-time input on “Refinder”. The Forest panel consists of the limited function of “Forest”, such as the receiving and the recording of the images from NM33.

7.2 Start, close and key features

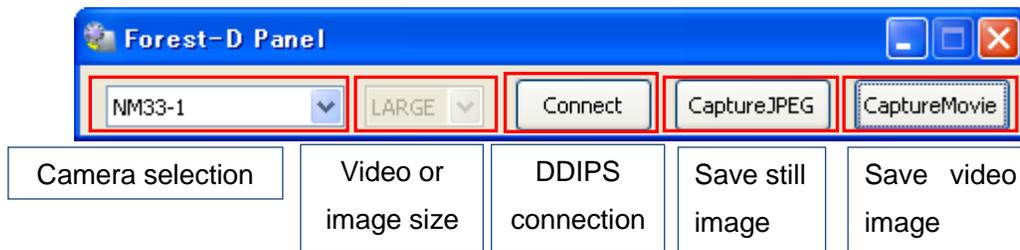
(1) to start the Forest Panel

While connecting NM33 to a PC, select [File] – [Source] – [Forest].

The following functions are available with the Forest Panel.

- select camera (except “Forest-OH”)
- connect with DDIPS (only “Forest-D”)
- save the video and image

【Forest Panel】



(this is a screenshot of “Forest-D”)

Notes:

- * According to the type of “Forest”, some button is not available.
- * The image size is fixed with “Large Size”.
- * Connection to DDIPS can be done directly by “Refinder” without using “Forest-D”. However, use “Forest-D” If you wish to record simultaneously.

(2) to close the Forest Panel

- ① Click the [X] button of the Forest Panel to close the Forest Panel. (“Refinder” does not close.)
- ② If re-start the real-time input, execute to start the Forest Panel again.

Note: When closing “Refinder”, the Forest Panel will close automatically.

(3) Select the camera (except “Forest-OH”)

- ① Select a camera in the select box for the camera selection.

(4) to connect with DDIPS (“Forest-D” only)

- ① Click the [Connect] button.

Notes :

- this is same as the [NetworkCamera] button  of “Forest-D”.
- The setting for connecting with DDIPS must follow the normal process to start “Forest-D”.
- The detail should be referred to the instruction of “Forest-D”.

7.3 Recording the raw image (non-dewarped image)

To record the raw image (non-dewarped image) data, which “Forest” has received, into a video image (AVI file) or a still image (JPEG file). It is not possible to record any images other than the raw image.

Saving the dewarped image can be done by the main window of “Refinder”.

(1) to save the video image

- ① Click the [Capture movie] button.
- ② In case of “Forest-N/OH/UH”, the [Save As] window appears.
Enter the file name and click [Save]. Recording will start.
- ③ In case of “Forest-D”, recording will start just after the process ①.
Setting of the folder to save and the file name can not be set by the Forest Panel.
“Forest-D” needs to be started normally to set.

Notes :

- same as the [Capture Movie] button under the normal start in “Forest-N/OH/UH”.
- same as the [Rec.] button under the normal start in “Forest-D”.

- The detail should be referred to the instruction of each “Forest”.

(2) to save the still image

- ① Click the [Capture JPEG] button.
- ② In case of “Forest-N/OH/UH”, the [Save As] window appears.
Enter the file name and click [Save]. Recording will start.
- ③ In case of “Forest-D”, recording will start just after the process ①.

Notes :

- same as the [Capture JPEG] button under the normal start in “Forest-N/OH/UH”.
- same as the [Photo] button under the normal start in “Forest-D”.
- The detail should be referred to the instruction of each “Forest”.