

USER MANUAL

**SPECULAR MICROSCOPE
SP-1P**

INTRODUCTION

Thank you for purchasing the TOPCON SPECULAR MICROSCOPE SP-1P.

INTENDED USE / INDICATIONS FOR USE

The SPECULAR MICROSCOPE SP-1P is a non-contact ophthalmic microscope, optical pachymeter, and camera intended for examination of the corneal endothelium and for measurement of the thickness of the cornea.

FEATURES

This instrument features the following:

- The position of the touch panel can be adjusted to accommodate the operator's preferred position. See page 50 for details.
 - Photography of the corneal endothelium can be performed with the auto-alignment function. See page 46 for details.
 - The manual image alignment function allows the operator to utilize the internal function of the SP-1P to focus on the cornea and obtain the image. The manual image alignment can be utilized in difficult lighting or cases where the subject has a difficult time fixating. See page 60 for details.
 - The cell analysis and corneal thickness measurement can be performed automatically.
 - The manual editing function allows the clinician to modify the cells selected on the automatically captured image. See page 63 for details.
-

PURPOSE OF THIS MANUAL

This Manual provides an overview of the basic operation, troubleshooting, checking, maintenance and cleaning of the TOPCON SPECULAR MICROSCOPE SP-1P.

To get the safe use of the instrument, read Safety Displays and Safety Cautions.

Keep this manual at hand for future reference.

Requests for use

Please evaluate the examination result of SP-1P not only with analysis result but also with reviewing the captured image at any time.



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1. No part of this manual may be copied or reprinted, in whole or in part, without prior written permission.
 2. The contents of this manual are correct to the best of our knowledge. Please inform us of any ambiguous or erroneous descriptions, missing information, etc.
 3. This manual is original instructions.
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DISPLAYS AND SYMBOLS FOR SAFE USE

In order to encourage the safe use of the instrument and to avoid danger to the operator and others as well as damage to properties, warnings are described in this manual and marked on the instrument body. We suggest you thoroughly understand the meaning of the following displays/icons and Safety Cautions, as well as read the manual, and strictly observe the instructions.

DISPLAY

DISPLAY	MEANING
 WARNING	A WARNING is provided to alert the user to potential serious outcomes (death, injury, or serious adverse events) to the patient or the user.
 CAUTION	A CAUTION is provided to alert the user to use special care necessary for the safe and effective use of the device. They may include actions to be taken to avoid effects on patients or users that may not be potentially life threatening or result in serious injury, but about which the user should be aware. Cautions are also provided to alert the user to adverse effects on this device of use or misuse and the care necessary to avoid such effects.
 NOTE	A NOTE is provided when additional general information is applicable.

SYMBOL

Symbol	Meaning	Signification
	Alternating Current	Courant alternatif
	Off (power: disconnection from the main power supply)	Éteint (courant: coupure avec le secteur)
	On (power: connection to the main power supply)	Allumé (courant: raccordement sur le secteur)
	Type B applied part	Partie appliquée du Type B
	General warning sign	Symbole d'avertissement général
	Refer to instruction manual/booklet	Voir le manuel/la brochure
	Date of manufacture	Date de fabrication
	Serial number	Numéro de série
	Manufacturer	Fabricant
	Authorised Representative in the European Community	Représentant autorité pour l'Union européenne
	Unique Device Identification (UDI)	Identification unique des dispositifs (IUD)

Symbol	Meaning	Signification
	Humidity limitation	Limite d'humidité
	Atmospheric pressure limitation	Limite de pression atmosphérique
	Temperature limit	Limite de température
	Fragile, handle with care	Fragile manipuler avec soin
	Keep dry	Garder au sec
	This way up	Vers le haut
	Maximum number of identical packages which may be stacked on one another.	Nombre maximum d'emballages identiques pouvant être empilés les uns sur les autres.
	General symbol for recovery/recyclable. (for the package)	Symbole général de tri sélectif. (pour l'emballage)
	Recycling symbol for plastic in the package. Low density polyethylene	Symbole de recyclage du plastique de l'emballage. Polyéthylène basse densité
		
	Recycling symbol for plastic in the package. Polypropylene	Symbole de recyclage du plastique dans l'emballage. Polypropylène
		
	Recycling symbol for plastic in the package. Polystyrene	Symbole de recyclage du plastique dans l'emballage. Polystyrène
		
	Indicates that the product conforms to the requirements of the Medical Device Regulation (EU) 2017/745 and of the other applicable Union legislation	Indique que le produit est conforme aux exigences du Règlement (UE) 2017/745 relatif aux dispositifs médicaux et des autres lois applicables de l'Union Européenne
	WEEE label The symbol indicates that the product should not be discarded as unsorted waste but must be sent to separate collection facilities for recovery and recycling.	Marquage des DEEE Il s'agit d'un symbole indiquant que le produit ne doit pas être éliminé avec les déchets non triés, mais doit être envoyé dans des installations de collecte séparées destinées à la valorisation et au recyclage.
	EU Battery Directive Battery users must not dispose of batteries as unsorted general waste, but treat properly.	Directive européenne sur les batteries Les utilisateurs de batteries ne doivent pas jeter les batteries comme des déchets généraux non triés, mais les traiter correctement.

GENERAL SAFETY INFORMATION



Ensuring the Safety of Patients and Operators

Be careful not to hit the patient's eyes or nose with the instrument during operation. The patient may be injured.

Preventing Electric Shocks and Fires

To avoid injury caused by electric shock, do not open the cover. Ask your dealer for service.

To avoid fire and electric shock, install the instrument in a dry place free of water and other liquids.

To avoid fire and electric shock, do not put cups or other containers with liquids near the instrument.

To avoid electric shocks, do not insert metal objects into the instrument body through the vent holes or gaps.

To avoid fire in the event of an instrument malfunction, immediately turn OFF the power switch "○" and disconnect the power plug from the outlet if you see smoke coming from the instrument, etc. Don't install the instrument where it is difficult to disconnect the power plug from the outlet. Ask your dealer for service.

Do not disassemble, modify or repair the equipment. Doing so can cause electric shock or fire.

CAUTION

Ensuring the Safety of Patients and Operators

The following patients should be carefully applied:

The patient with a history of epilepsy and the patient who is suspected of epilepsy.

If a symptom of photosensitive epilepsy appears in a patient during photography, please stop photography and measurement immediately.

When operating the up/down button for chinrest, be careful not to pinch the patient's hand. The patient may be injured.

If the part of the instrument might be in contact with the patient's nose during auto alignment, please tell the patient to remove his face from the chinrest and forehead rest, and press the emergency stop button. There is a risk that the part of the instrument is in contact with the patient's nose.

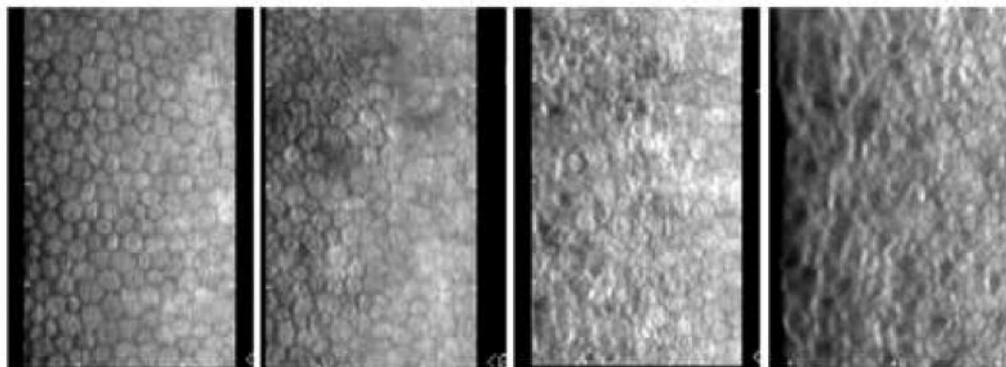
To avoid injury for an operator when photographing with patient's eyelid opened, be careful not to pinch the operator's hand between the photographing head and the chinrest section.

Precaution

Precaution: Agreement and variability of the analysis methods was obtained using a sample in which eyes had a Percent Hexagonality range of 31-79, CV range of 23-40, CD range of 700-3413, and Central Corneal Thickness range of 466-669. Accuracy and variability of the analysis methods is not known for eyes with parameters beyond these values.

Precaution: The accuracy, repeatability, and reproducibility of paracentral and peripheral measurements have not been assessed. You should interpret results from these tests with caution.

Precaution: The accuracy and precision of numerical results (e.g., Endothelial Cell Density, Coefficient of Variation, % Hexagonality, and Center Thickness) are highly dependent upon image quality and (for endothelial images) the number of cells in the image. We recommend wherever possible, use of at least "good" quality image (See Figure 1) and images with at least 100 cells. Use of lower quality images or images with fewer cells is likely to result in results of lower accuracy, and precision. Results from the use of such images should be interpreted with caution.



Good Quality

Fair Quality

Poor Quality

Impossible Quality

Figure 1

McCarey, BE, Edelhauser, HF, & Lynn, MJ. (2008). Review of corneal endothelial specular microscopy for FDA clinical trials of refractive procedures, surgical devices and new intraocular drugs and solutions. *Cornea*, 27(1): 1-16.

Precaution: The accuracy, repeatability, and reproducibility of manual editing has not been assessed in a clinical study. You should interpret results from these tests with caution.

Precaution: When the Eye Care professional inspects the software-created cell demarcations in the image, he may find them to be inaccurate or questionable. He should then modify these results using the manual editing feature. The accuracy and precision of the resulting calculated parameters when using this feature are dependent upon the expertise and judgment of the user.

Precaution: The software-generated values for CV may demonstrate lower readings at the high end of the scale. In addition, for % Hexagonality, may demonstrate lower readings at the low end of the scale. In both cases, this indicates that results associated with stressed corneas may be unreliable. Therefore, these results should be interpreted with caution. Alternatively, for more reliable measures of these parameters, a purely manual assessment may be performed.

Ensuring Security

- When connecting this instrument to an external device through LAN, apply the security update to the external device, make use of anti-virus software and take other countermeasures against computer virus properly.
- Do not connect any USB storage device that is not checked with the anti-virus software to the USB port of this instrument.
- When connecting this instrument to an external device through LAN, set the ID and password of the user to the external device.
- When outputting data to the shared folder on an external device from this instrument, set a proper user ID and password to the shared folder.

Electromagnetic Compatibility (EMC)

This instrument has been tested (with 100/120/230V) and found to comply with IEC 60601-1-2:2014+AMD1:2020 (Ed.4.1). This instrument radiates radio frequency energy within standard and may affect other devices in the vicinity. If you have discovered that turning on/off the instrument affects other devices, we recommend you change its position, keep a proper distance from other devices, or plug it into a different outlet. Please consult your authorized dealer if you have any additional questions.

HOW TO READ THIS MANUAL

- Read the instructions on pages 1 to 12 before using the machine.
- Regarding connection to various devices, see “CONNECTING EXTERNAL I/O TERMINALS” on page 34.
- If you would like an overview of the system, begin by reading “BASIC OPERATIONS”(page 41).
- For setting various functions, see “SETTING FUNCTIONS ON SETUP SCREEN” on page 68.

GENERAL MAINTENANCE INFORMATION

Do not perform any maintenance work while the instrument is in use on a patient.

USER MAINTENANCE

To maintain the safety and performance of the equipment, never attempt to repair or perform maintenance. These tasks should be performed by an authorized service representative.

Maintenance tasks that can be performed by the user are as follows; for details, follow the manual's instructions.

CLEANING OF PHOTOGRAPHING WINDOW

For details, See “CLEANING THE PHOTOGRAPHING WINDOW GLASS” on page 98.

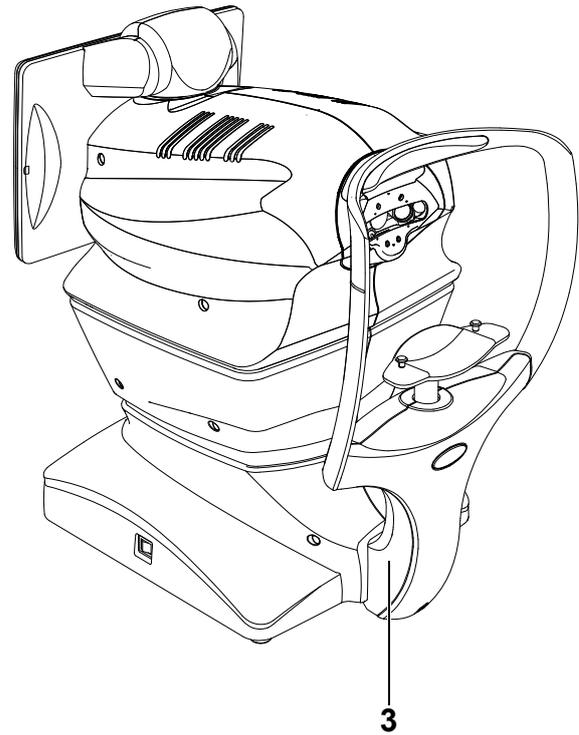
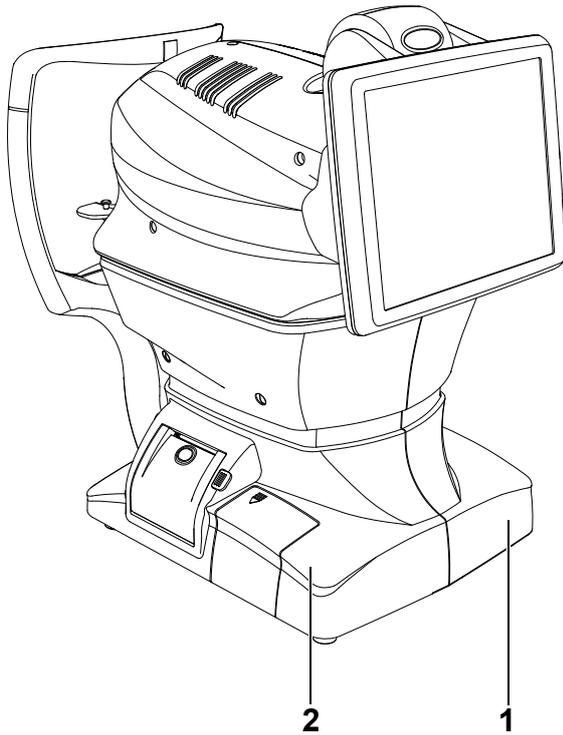
DISCLAIMERS

- TOPCON is not responsible for damage due to fire, earthquakes, actions or inactions of third persons or other accidents, or damage due to negligence and misuse by the user and any use under unusual conditions.
- TOPCON is not responsible for damage derived from inability to properly use this equipment, such as loss of business profits and suspension of business.
- TOPCON is not responsible for damage caused by operations other than those described in this manual.
- The device does not provide a diagnosis of any condition or lack thereof or any recommendations for appropriate treatment. The relevant healthcare provider is fully responsible for all diagnosis and treatment decisions and recommendations.

POSITIONS OF WARNING AND CAUTION INDICATIONS

To secure safety, this equipment provides warnings.

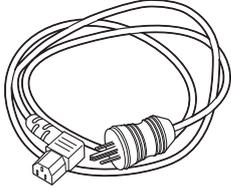
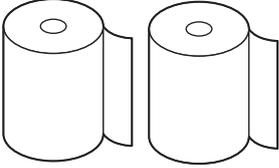
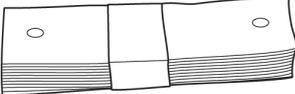
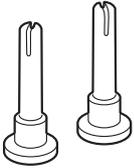
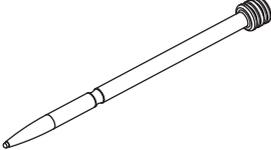
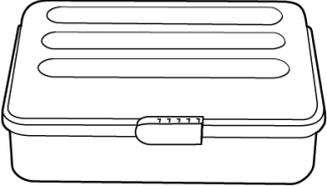
Correctly use the equipment following these warning instructions. If any of the following marking labels are missing, please contact your dealer or TOPCON at the address stated on the back cover.



No.	Label	Meaning	Signification
1		WARNING To avoid injury caused by electric shock, do not open the cover. Ask your dealer for service.	MISE EN GARDE Ne pas ouvrir le couvercle pour éviter les blessures causées par un choc électrique. Demander au revendeur d'effectuer le service.
2		CAUTION Be careful not to hit the patient's eyes or nose with the instrument during operation. The patient may be injured.	PRÉCAUTION Prendre garde de ne pas frapper les yeux ou le nez du patient avec l'instrument pendant l'opération.
		CAUTION When operating the up/down button for chinrest, be careful not to pinch the patient's hand. The patient may be injured.	PRÉCAUTION Prendre garde de ne pas pincer la main du patient en opérant le commutateur haut/bas du support de jugulaire. Le patient pourrait être blessé.
3		Degree of protection against electric shock :TYPE B APPLIED PART	Degré de protection contre les chocs électriques: TYPE B PARTIE D'APPLICATION

STANDARD ACCESSORIES

The following are standard accessories. Make sure that all these items are included (quantity).

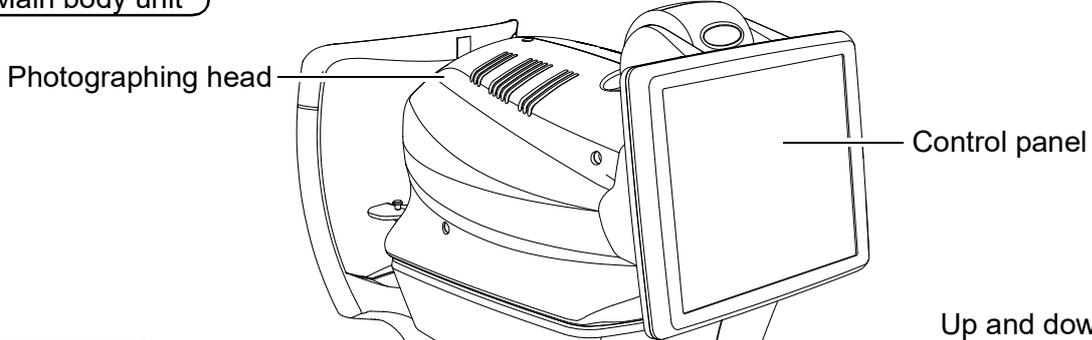
<p>User manual, Instruction manual*, Unpacking and Assembling (1 each)</p> 	<p>Power cable (1)</p> 
<p>Dust cover (1)</p> 	<p>Printer paper (2)</p> 
<p>Monitor cleaner (1)</p> 	<p>Chinrest tissue (1)</p> 
<p>Chinrest tissue pin (2)</p> 	<p>Stylus pen (1)</p> 
<p>Accessory case (1)</p> 	

*: Instruction manual is not included in the standard specifications for some areas.

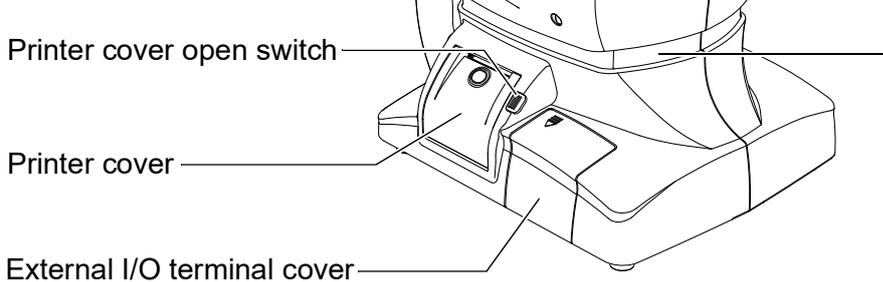
COMPONENTS

COMPONENT NAMES

Main body unit



Power unit

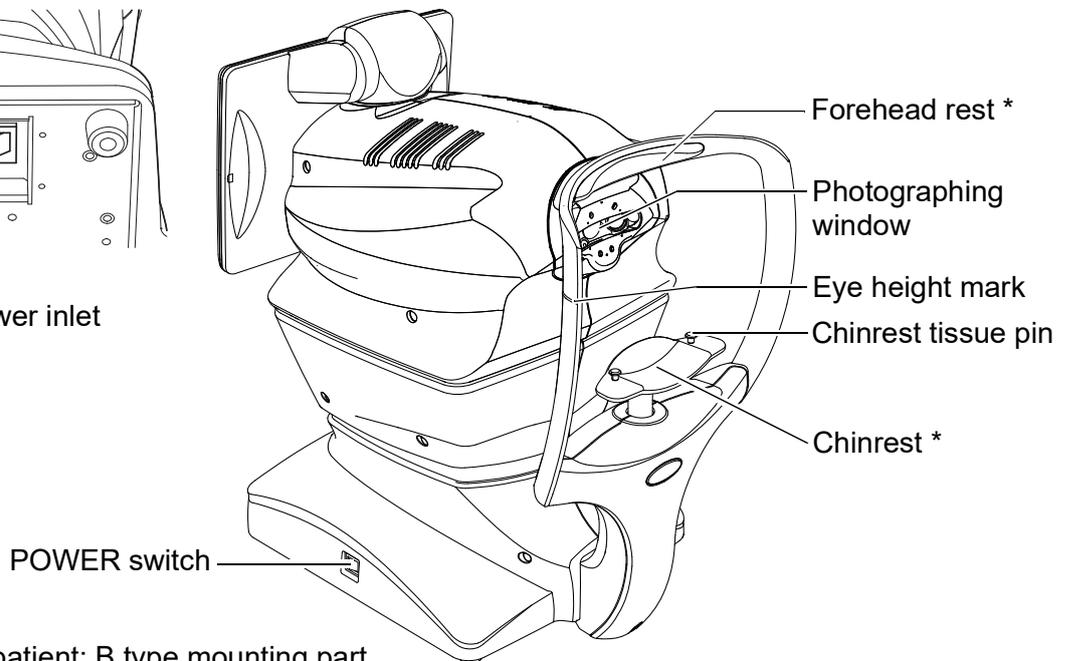
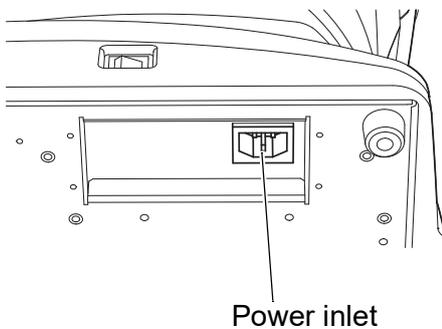


Up and down position check seal



The up and down position of the measuring head can be checked. The central position of the up and down triangle shows the central position of the up and down direction of the measuring head.

Chinrest unit



* Parts of contact the patient: B type mounting part

COMPOSITION OF PARTS WHICH CONTACT THE HUMAN BODY

Forehead rest : Silicone rubber

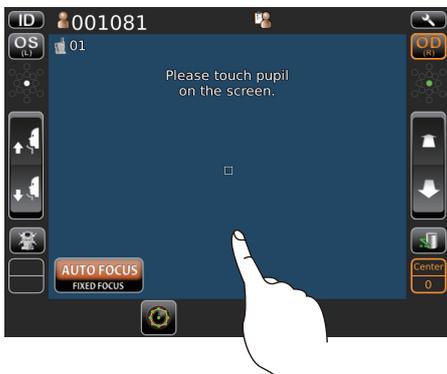
Chinrest : Acrylonitrile butadiene styrene resin

OPERATION METHOD OF CONTROL PANEL

The control panel is designed as a touch panel for performing various operations and settings. It displays images and shows information, including set conditions and photographing results.

 NOTE	<ul style="list-style-type: none">• The control panel is a touch panel. Do not use any sharp tools; e.g. ball point pen.• Do not touch two points on a control panel simultaneously.
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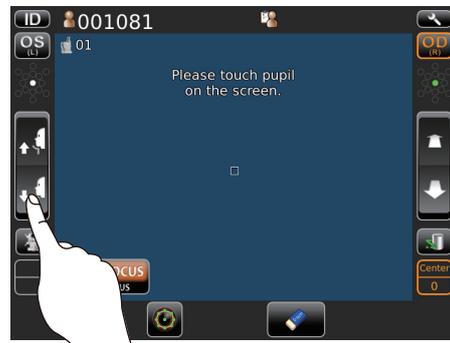
Tap → To select any relevant item.



Touch the control panel softly with a finger.

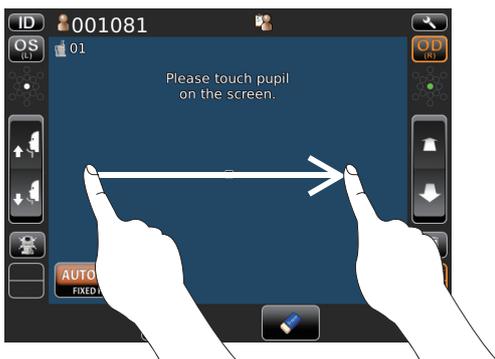
Continue to press →

Used for continuous moving.
(Moving of chinrest and photographing head)



Continue to touch the screen softly with a finger.

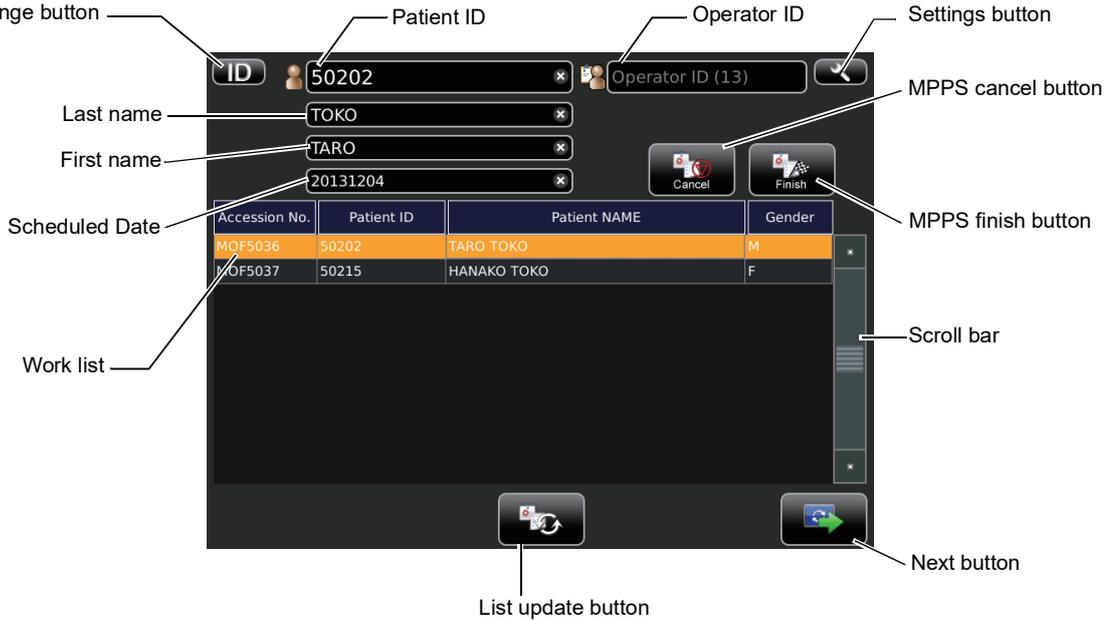
Drag → Under manual alignment.



Touch and move on screen softly with a finger.

CONTROL PANEL COMPONENTS

PATIENT SCREEN (DICOM WORK LIST)

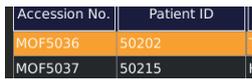


 Patient ID input change button.....A patient screen is switched to ID input.

The keyboard is displayed if tapping the Patient ID, Last name, First name or Sche.Date; you can query a patient under specified condition in the work list.

 MPPS cancel button.....Communicates to DICOM MPPS (Modality Performed Procedure Step) that the selected patient's examination is canceled.

 MPPS finish button.....Communicates to DICOM MPPS that the selected patient's examination is completed.

 Work listThe work list which is gained by DICOM MWM (Modality Work list Management) server is shown.

 List update button.....Updates the work list.

 Settings buttonDisplays the Setup screen.

 Scroll barWhen there are many work lists, the following hidden list is displayed.

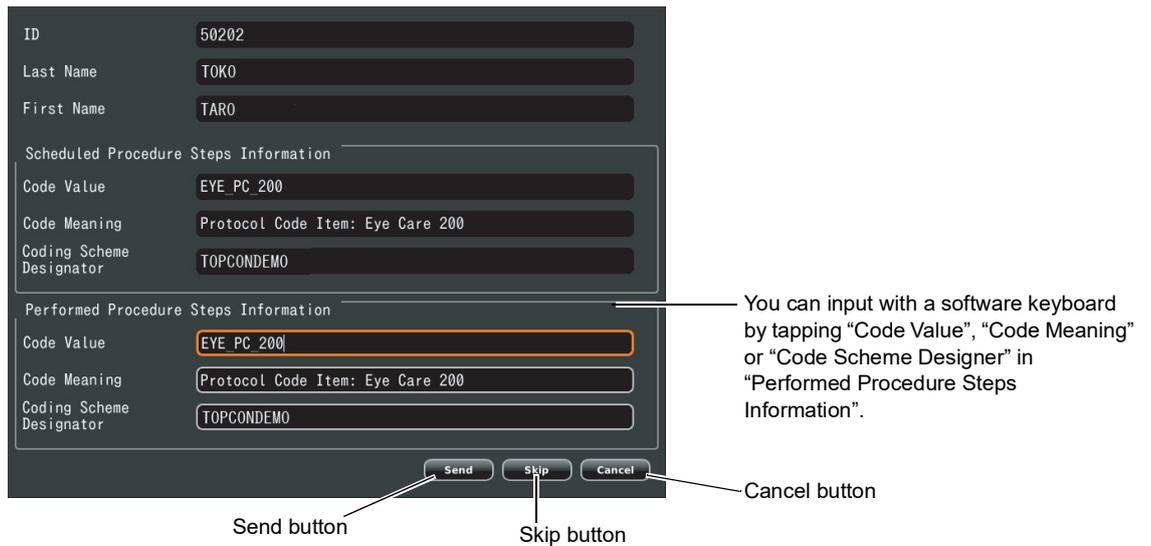
 Next button.....Patient selecting is complete and moves to MPPS start screen.

- When a query condition is inputted into either of Patient ID, Last name, First name and Sche. Date and the list update button is tapped, the result of matching with the query condition is displayed on the work list.
- It is possible to designate Patient ID, Last name and First name by means of wild card collation (“*” or “?”).
- “*” can be matched with any sequence (the length 0 is included) of characters .
- “?” can be matched with any one character.

- The expected query results of wild card collation may not be obtained according to the specification of DICOM SCP (Service Class Provider).



DICOM MPPS START SCREEN



	Send button	MPPS Create transmission is performed and moves to Photography setting screen.
	Skip button.....	MPPS Create transmission is not performed but moves to Photography setting screen.
	Cancel button	MPPS Create transmission is not performed and backs to Patient screen. (DICOM work list)

PATIENT SCREEN (ID INPUT)



 Patient list buttonDisplays the Patient screen (DICOM work list). This button appears when “Use LAN” of “NETWORK SETTINGS” (P.76) in the setup screen is ON, and when the “Use DICOM” and “Use Worklist” (P.77) in the “DICOM SETTINGS” are ON.

 Caps Lock buttonThe letters on software keyboard changes Capital/small.

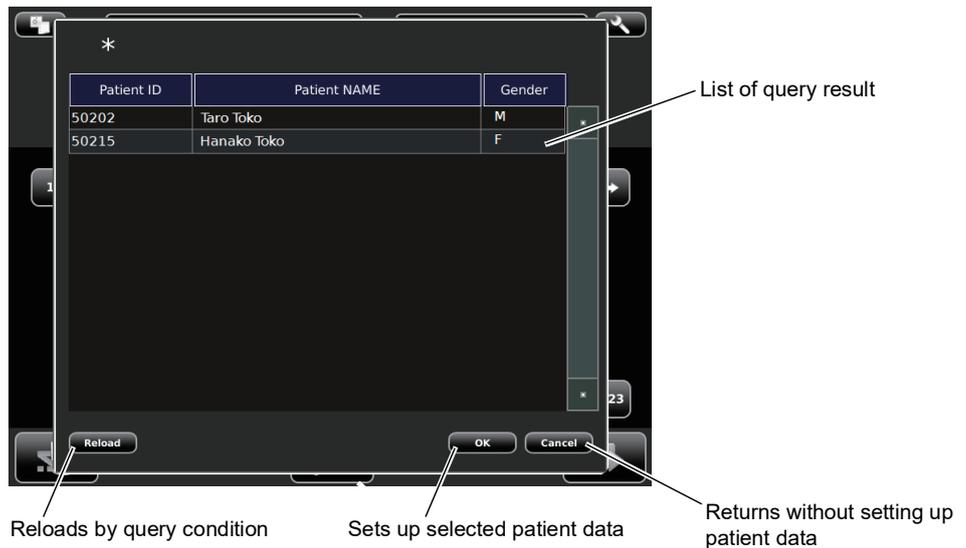
 Settings buttonDisplays the Setup screen.

 Ten key changeover buttonLayout of software keyboard changes QWERTY/Ten key.

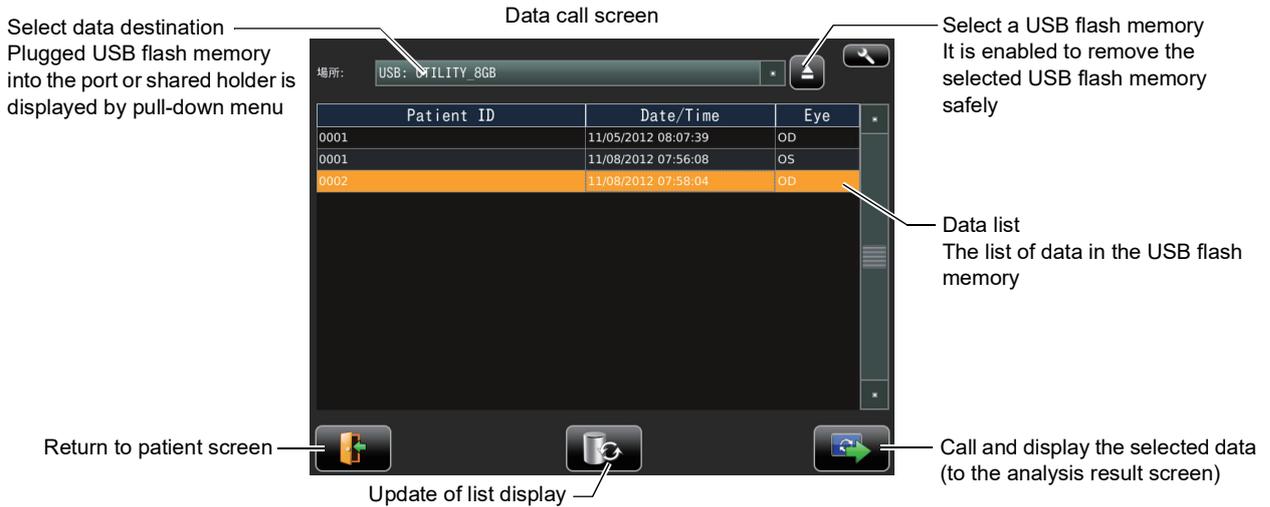
 Next buttonPatient selecting is complete and photography setting screen is set.

 Query patient button.....Query the inputted patient ID in the DICOM Query/Retrieve saver. This button appears when “Use LAN” of “NETWORK SETTINGS” (P.76) in the setup screen is ON, and when the “Use DICOM” and “Use Patient Query” (P.77) in the “DICOM SETTINGS” are ON.

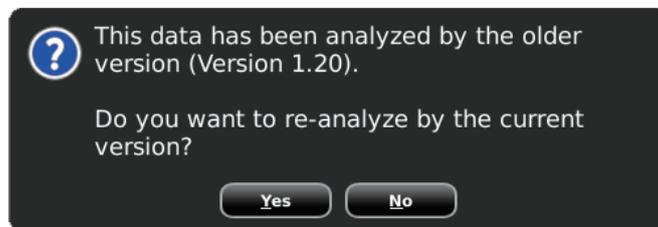
- It is possible to designate Patient ID by means of wild card collation (“*” or “?”).
- “*” can be matched with plural characters (the length 0 is included). “?” can be matched with any single character.
- The expected query results of wild card collation may not be obtained according to the specification of DICOM SCP (Service Class Provider).
- When the querying patient has been completed, the list of query results is displayed in the following screen. It may take some time to display the query result.



Data call buttonCalls selected data which is stored in USB flash memory or shared holder.

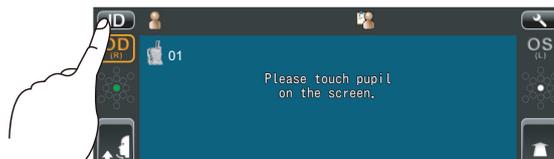


When the data called using “Call and display the selected data” was analyzed by 1.20 or lower-version software, it can be chosen whether data is reanalyzed with the analysis software of the current version. If tapping the “Yes”, the result of reanalysis by the current version is displayed. If tapping the “No”, the analysis result is displayed by the old version.



HOW TO INPUT A PATIENT ID

- 1 Tap the **Patient ID input change button** on the control panel.



Patient ID input screen is selected.



- 2 Tap the input window of patient ID to change the frame color to orange.



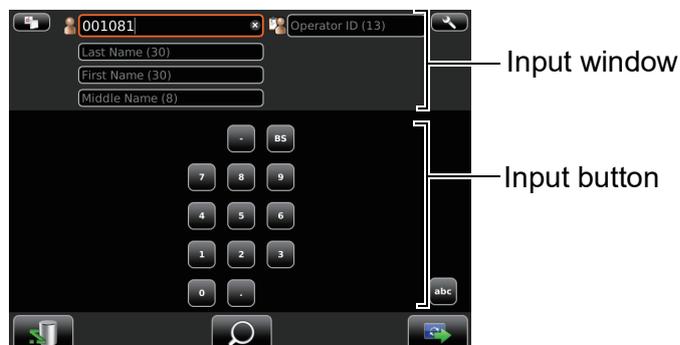
- 3 Enter the Patient ID tapping the **Input button**.



- 4 If you need to input numeral by ten-key, ten-key input screen appears by tapping the

Ten key changeover button.

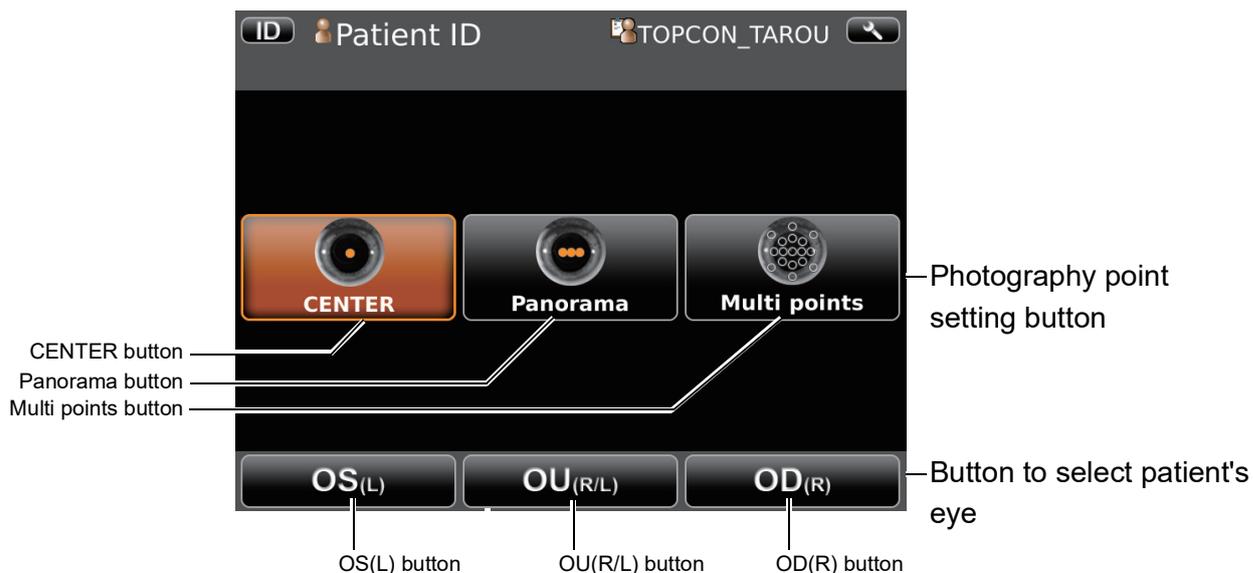
Input in same manner above **2-3**.



5 Tap the **Next button** to return to the capture screen, check that patient ID is updated.



PHOTOGRAPHY SETTING SCREEN

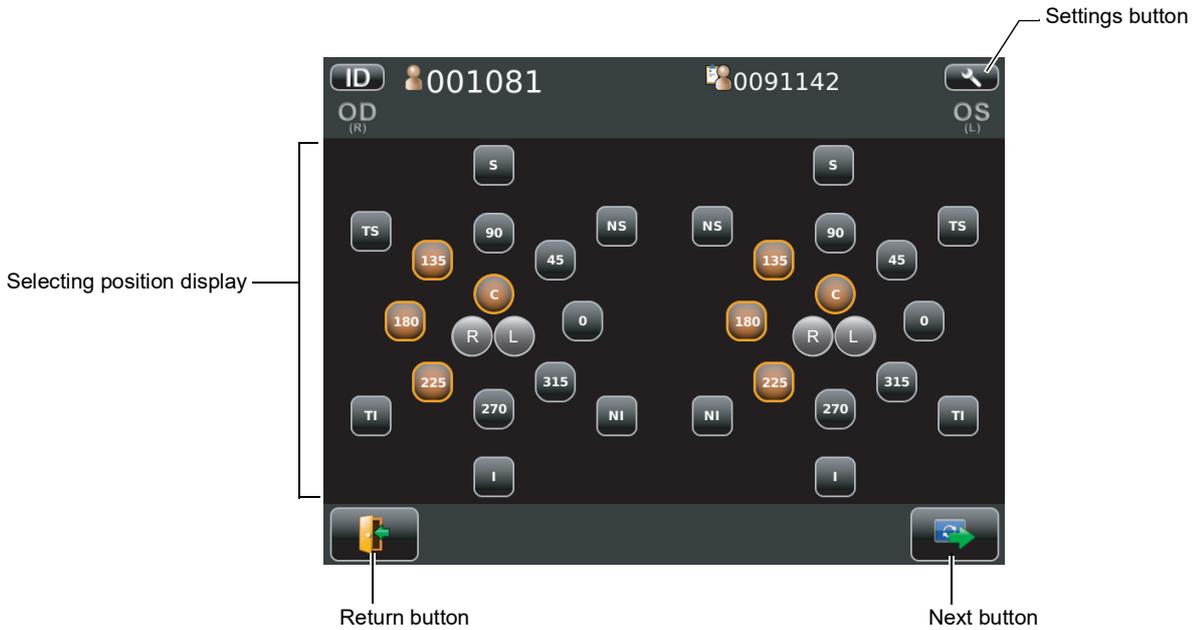


- 
 CENTER buttonCentering photography is set.
- 
 Panorama button.....Panorama photography that is to photograph 3 points around the center is set.
- 
 Multi points button.....Multi points photography that is to photograph specified circumference position is set.
- 
 OS(L) button.....Photographs left eye only in the selected photography point. If selection is complete, moves to capture screen.
- 
 OU(R/L) button.....Photographs two eyes (R/L) in the selected photography point. If selection is complete, moves to capture screen.
- 
 OD(R) button.....Photographs right eye only in the selected photography point. If selection is complete, moves to capture screen.

- When Multi points button is selected, selecting one of OD(R) button, OU(R/L) button or OS(L) button moves to photographing position selecting screen.

PHOTOGRAPHING POSITION (SHOWING POSITION OF FIXATION TARGET) SELECTING SCREEN

When Multi point button is selected in photography point, photographing position selecting screen is shown. Photographing position is determined here.



Selecting position display.....The position to be photographed is selected.

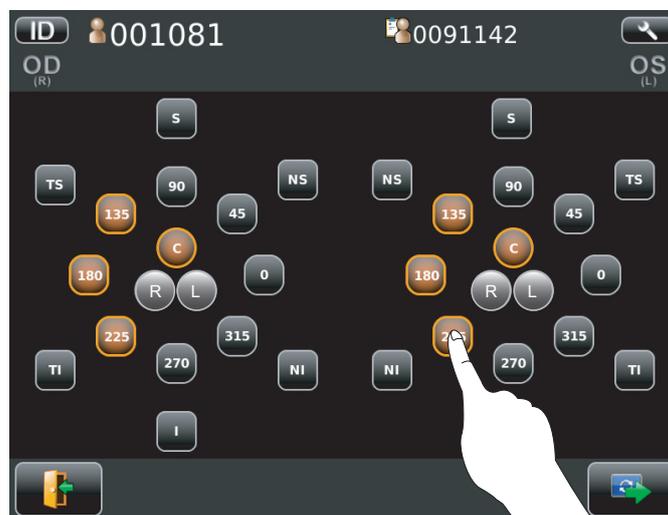
 Settings buttonDisplays Setup screen.

 Return buttonWhat has been entered is abandoned returns to patient screen.

 Next button.....The position selected is determined, moves to capture screen. (If no position is selected, the next button is not displayed.)

- Operation on photographing position selecting screen.

Tap the button for the position to be photographed. Selected position is colored in orange.



- The fixation target is lighted on diagonal location for selecting the desired position.

CAPUTER SCREEN

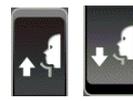
The image to be observed is displayed operating the instrument to tell the state of setting or the result of photography.

UNDER PHOTOGRAPHING



 ID button.....Input the patient ID (up to 13 characters) and operator ID (up to 13 characters). However, if no patient ID is input, the patient No. is allocated automatically. Operator ID is not always shown according to the settings. (See page 77 regarding on the settings)

 OD button/OS button.....Select the right eye or left eye. The main body moves to selected direction by tapping this button. Selected eye is colored in orange. (OD: Right eye OS: Left eye) R/L display can be reversed depending on the control panel position.

 Up/down button for chinrest.....Moves the chinrest up/down.

 Forward/backward button for photographing head.....Moves the photographing head closer to/away from the patient's eye. Forward/backward movement can be reversed depending on the control panel position.

 Settings button.....Displays the Settings screen.

 Photographing position displayThe position selected is colored in orange. The position on which photography is complete is shown by white circle.

 End buttonMove the chinrest and photographing head to the last position.

 Data call buttonCalls selected data which is stored in USB flash memory.

 Photographing position/number of photography display.....Displays contemporary Photographing position selected and number of photographing.



Focus mode buttonFocus mode in auto alignment is switched to AUTO FOCUS and FIXED FOCUS. (Refer to P.60)



Photographing skip buttonThe present photography is skipped and changes to the next photography point.

The following message window is displayed by tapping the photographing skip button. If tapping the "OK", the present photography is skipped and moves to the blank analysis result screen.



Emergency stop buttonAppears only when automatic operation is carried out. The operation stops immediately.

PHOTOGRAPHING RESULT SCREEN

Labels for the photographing result screen:

- Corneal endothelium image (basis image)
- Analyzing image
- Hexagon scale (The size of the cell corresponding to the CD value)
- Anterior image
- Date of photographing
- OD button/OS button
- Photographing point display
- Pleomorphic histogram
- Polymorphic histogram
- Number of cell analyzed
- Minimum cell area
- Maximum cell area
- Average cell area
- Standard deviation of cell area
- Function button
- Photographing position tab
- Print/Output reservation mark
- Corneal thickness
- Cell density
- Coefficient of variation
- Frequency of hexagon cells

FUNCTION BUTTON

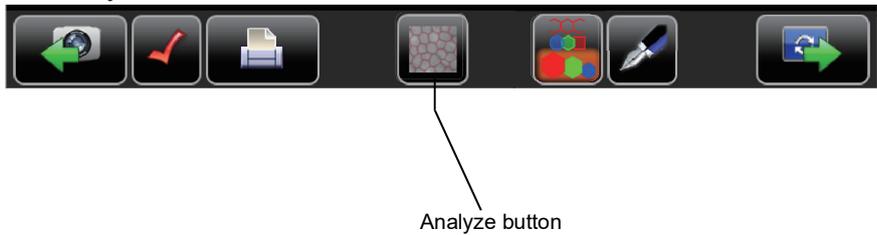
• When the "Auto analyze" is set to ON

Labels for the function button bar:

- Rephotographing button
- Print/output reservation button
- Print/output button
- Overlay button
- Manual editing button
- Next button

-  Rephotographing buttonPhotographing the same position.
(Move to the capture screen.)
-  Print/output reservation buttonThis is shown only when more than 2 times photographed on
the same position.
Data temporarily displayed is set to print/output.
-  Print/output buttonPrinting/output carried out according to the settings.
-  Overlay buttonClassifies the image to analyze in color according to the
number of cell's angle or cell area.
-  Manual editing buttonMoves to the screen for manual editing.
-  Next buttonIf there are more than 2 positions to photograph, next button
is displayed instead of Print/output button until photography
for the last position is complete. Tapping next button return to
capture screen to photograph the next position.

• When the “Auto analyze” is set to OFF

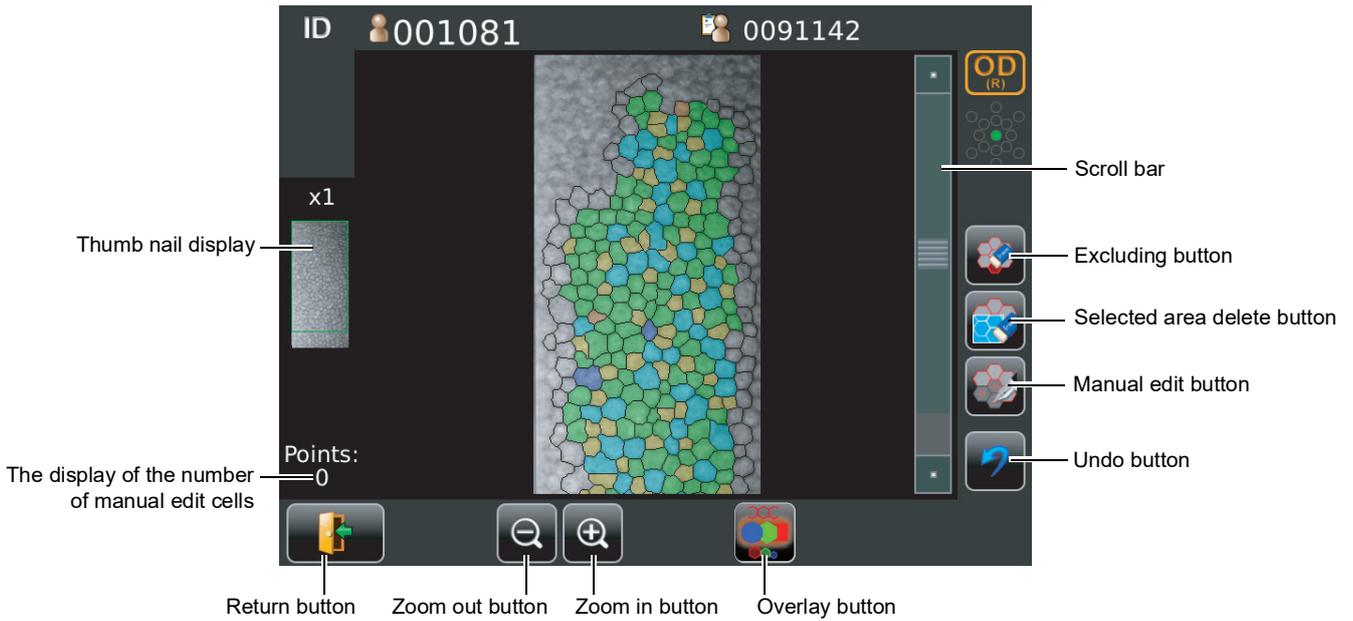


-  Analyze buttonThis button appears only when the “Auto analyze” is set to
OFF by initial setting. After photographing tap this button to
analyze if necessary.

- When the hexagonality is not able to calculate, the result value will be displayed “N/A”.
- When the following message appears, the number of cells which has been analyzed is a few.
“Low reliability data. Please check the analysis results.”
The number of cells detected is put in parentheses ().
“Low Reliability” is output in analysis results and print/output results.

MANUAL EDITING SCREEN

Screen for editing the result of automatic cell analysis.



Thumb nail displayWhen the image is enlarged the enlarged area is shown. The area is flamed in green.

Scroll barUses to show the hidden list by dragging up and down.

 Excluding button.....Exclude the cell specified form analysis while remains boundary line of cell.

 Selected area delete buttonYou can delete the cell within selected area and the dot of manual editing by dragging corneal endothelium image.

 Manual edit button.....Specifies a cell which you need to analyze manually by tapping the center of the cell.

 Undo buttonYou can undo one operation of “Exclude”, “Selected area delete”, and “manual edit”. If manual edit check is performed, operation of before then cannot be undone.

 Points: 0 The display of the number of manual edit cells
.....The number of the cells specified by manual edit is displayed.

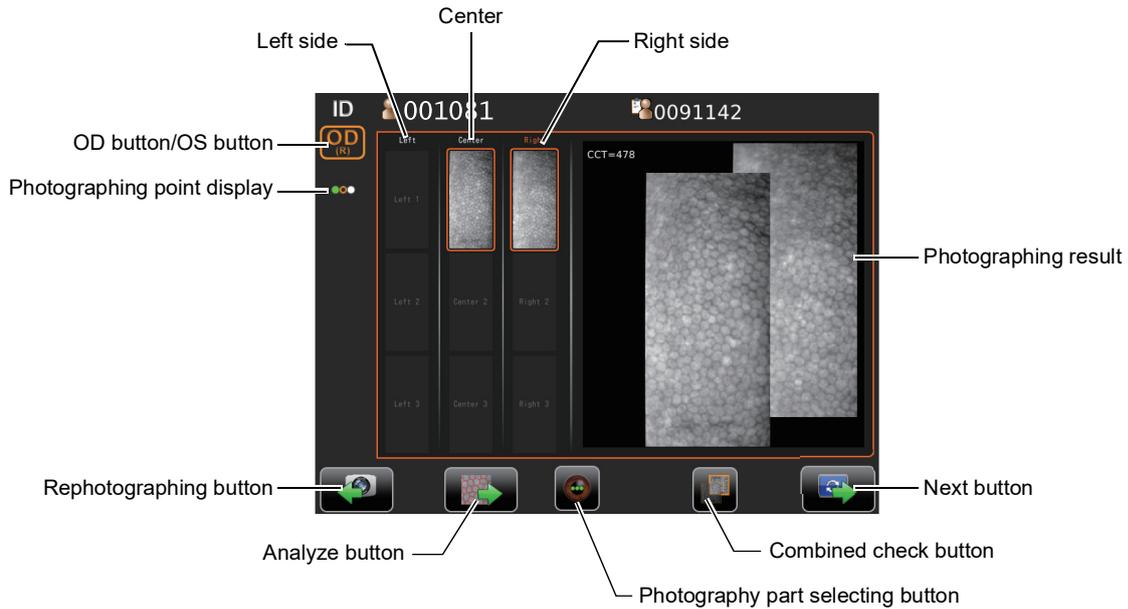
 Overlay button.....Classifies the image to analyze in color according to the number of cell's angle or cell area.

 Zoom in button/Zoom out buttonEnlargement and reduction of image are done.

 Return button.....Returns to Analysis result screen.

THE CHECKING SCREEN IN THE MIDDLE OF PANORAMA PHOTOGRAPHY

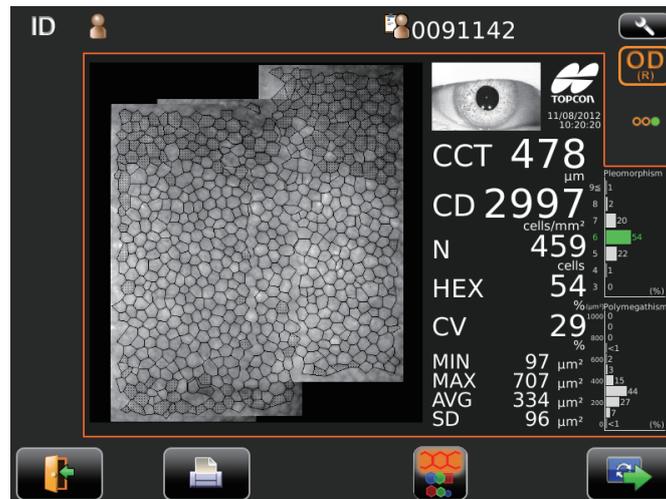
This screen appears when panorama photography is carried out, where 3 images are combined and photographing result of each position is checked.



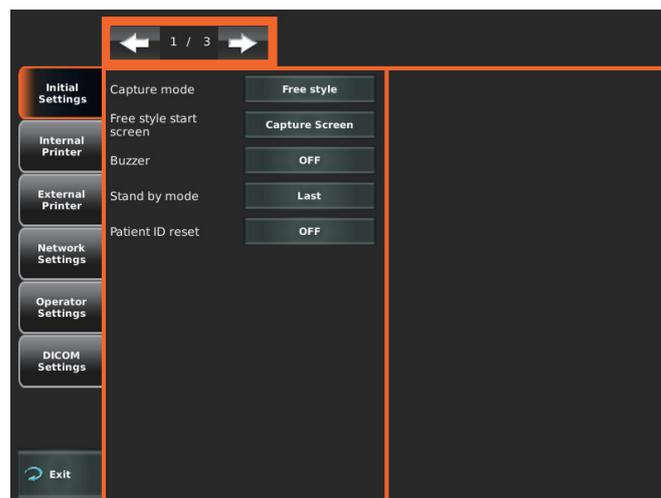
- 
Rephotographing button
Photographing the same position.
(Move to the capture screen.)
- 
Analyze button.....
Displays analyzing screen.
- 
Photography part selecting button.....
Selects a desired photography part and rephotographing can be performed.
- 
Combined check button.....
A combined condition can be checked by changing the transmissivity of the center image. (Dragging a combined image up and down can also change transmissivity.)
- 
Next button
If there are more than 2 positions to photograph, next button is displayed instead of Print/output button until photography for the last position is complete. Tapping next button return to capture screen to photograph the next position.

RESULT SCREEN FOR PANORAMA PHOTOGRAPHY

Result screen after photographing 3 images in Panorama photography.
 Button layout is same as that of normal photography result screen.



SETUP SCREEN



LIST OF PRINTING ITEMS SCREEN

When more than 2 positions is photographed list of printing items is shown during print/output is carried.

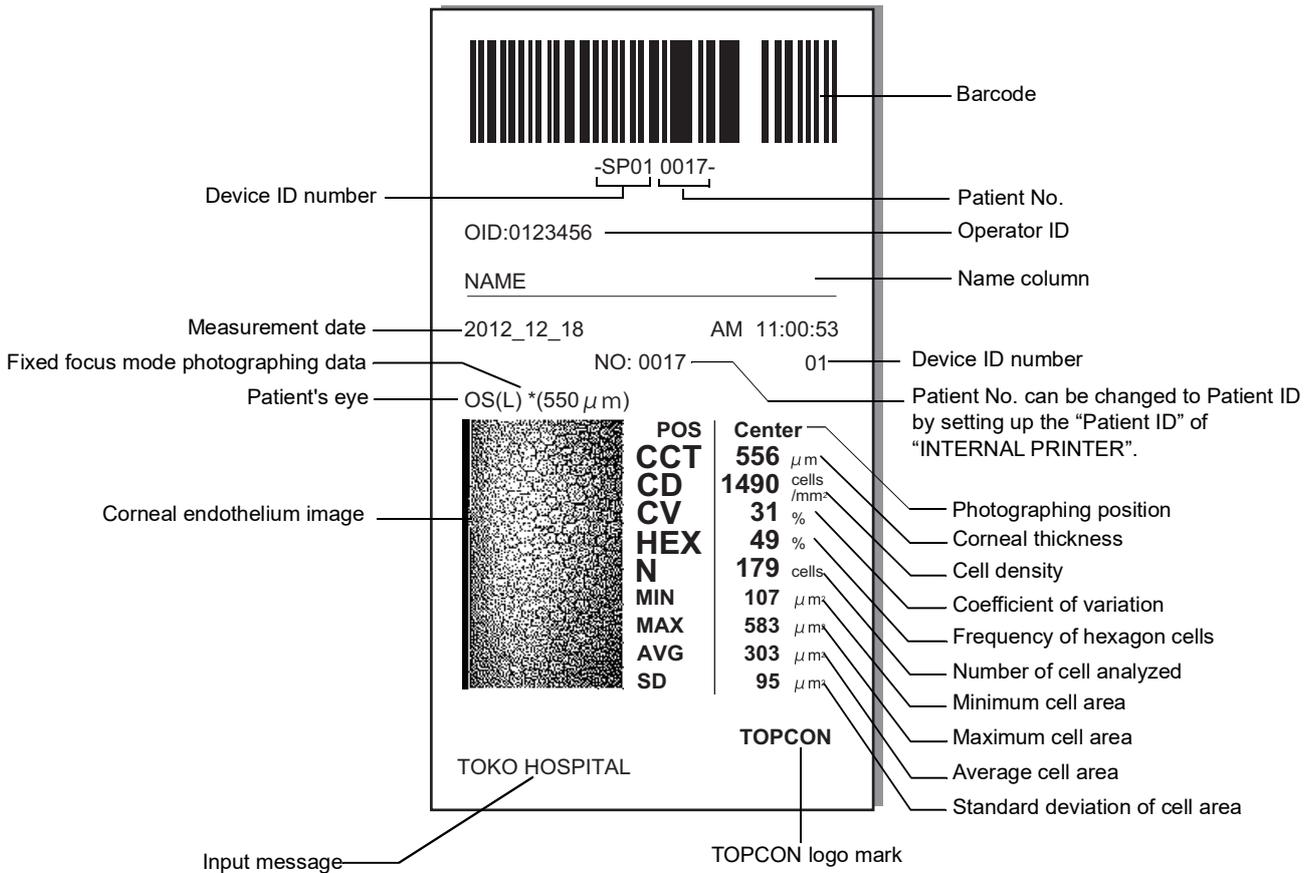
After print/output is complete, the screen returns to patient screen automatically waiting next patient.

OS(L)			OD(R)		
Position	Date/Time	Status	Position	Date/Time	Status
Center	2014/03/27 11:26:40	Skipped	Center	2014/03/27 11:25:51	Reserved
135°	2014/03/27 11:27:14	Reserved	180°	2014/03/27 11:25:51	Skipped
			225°	2014/03/27 11:26:19	Reserved

If the reliability is low, the character is displayed in yellow.

PRINTER OUTPUT

PRINTOUT OF SINGLE EYE PHOTOGRAPHED



- Even if Patient ID is selected in the "Patient ID" of "INTERNAL PRINTER", "Patient No." is printed when Patient ID is not entered. (Patient No: starts from 0001, automatically added +1 upon completion of photographing).
- When a patient name has been inputted, the name is printed at the name entry column automatically. If text overflow occurs, the last character is replaced at ellipsis "...".
- When photographing is performed in FIXED FOCUS mode, the (*) mark and the focus position that has been set up are printed.
- When the "Low Reliability" message was appear, the detection result of number of cells marked with a "(").

PRINTOUT OF PANORAMA PHOTOGRAPHED

Barcode

Device ID number: -SP01,0017-

Patient No.:

Operator ID: OID:0123456

Name column: NAME

Measurement date: 2012_12_18 AM 11:00:53

Fixed focus mode photographing data: NO: 0017 01

Device ID number: 01

Patient's eye: OD(R) *(550 μ m)

Patient No. can be changed to Patient ID by setting up the "Patient ID" of "INTERNAL PRINTER".

CCT	556	μ m
CD	1490	cells /mm ²
CV	31	%
HEX	49	%
N	179	cells
MIN	107	μ m ²
MAX	583	μ m ²
AVG	303	μ m ²
SD	95	μ m ²

Corneal endothelium image

Input message: TOKO HOSPITAL

TOPCON: TOPCON logo mark

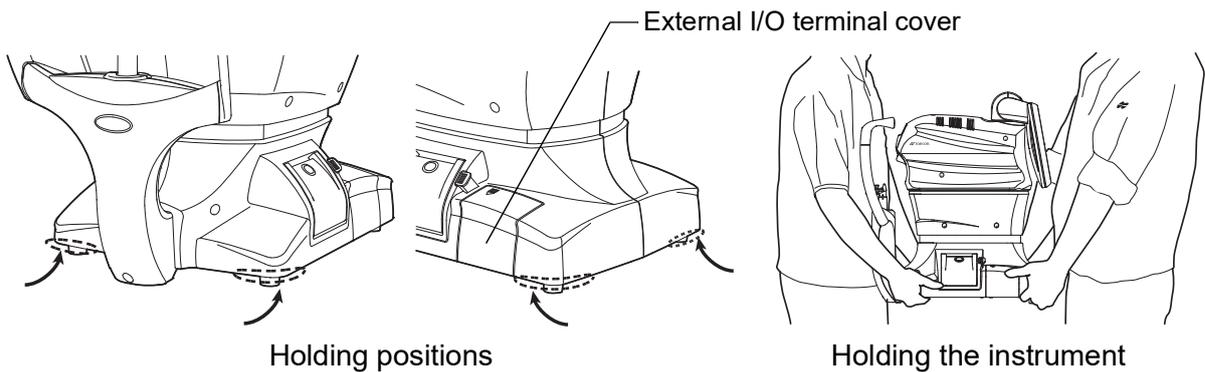
- When a patient name has been inputted, the name is printed at the name entry column automatically. If text overflow occurs, the last character is replaced at ellipsis "...".

PREPARATIONS

INSTALLATION

 CAUTION	<ul style="list-style-type: none">• When moving the instrument, two people should lift from the bottom of the device. One person lifting the device may cause harm to his back or injury by falling parts. Also, holding areas other than the bottom and holding the External I/O terminal cover may cause injury, as well as damage to the instrument.• To prevent damage and injuries, do not install the instrument on an uneven, unsteady or sloped surface.• When setting an instrument on an instrument table, pay attention not to injure the patient's fingers between the instrument and the table.• The instrument should also be placed away from strong light like direct sunlight. Auto alignment may not function properly.
--	--

- 1** Use the base stopper to fix the main body.
Firmly hold the instrument at the position shown below and place it on the automatic instrument table.



- 2** After installation, turn the base stopper down. The main body can be moved.

CONNECTING POWER CABLE

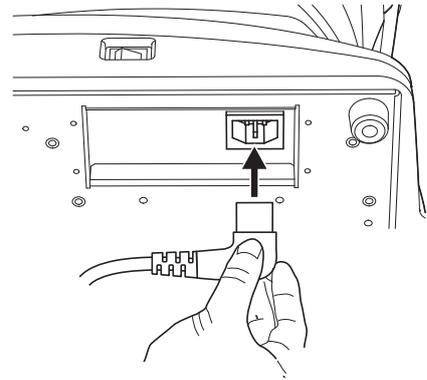
 WARNING	<p>Be sure to connect the power plug to an AC 3-pin receptacle equipped with grounding. Connection with receptacle without grounding may cause fire and electric shock in case of short-circuiting.</p>
--	---

 CAUTION	<ul style="list-style-type: none">• To avoid electric shocks, do not handle the power plug with wet fingers.• The power cable in standard accessories for this instrument cannot use besides this instrument.
--	--

- 1** Make sure the POWER switch of the instrument is OFF.
- 2** Tilt the body slowly so that the POWER switch is on top and the power inlet at the bottom can be seen.

3 Connect the power cable to the Power inlet.

4 Insert the power cable plug into the commercial power (the 3-pin AC grounding receptacle.)



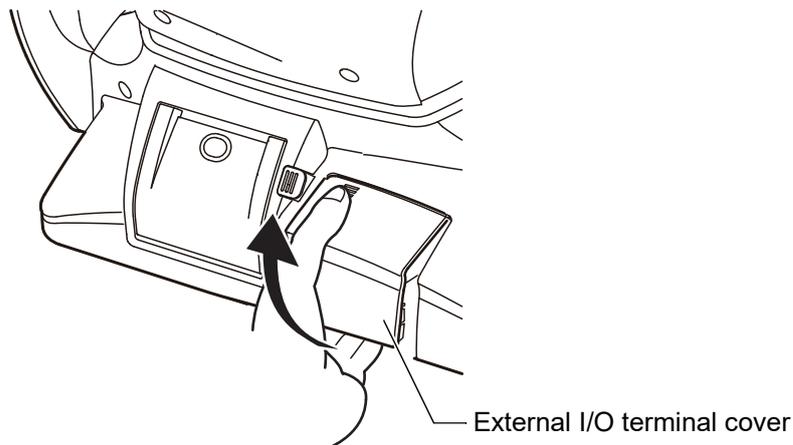
CONNECTING EXTERNAL I/O TERMINALS

 CAUTION	To avoid electric shock, do not touch the external connection terminal and the patient at the same time.
 NOTE	When connecting this product with a commercial personal computer, use one conforming to IEC 62368-1.

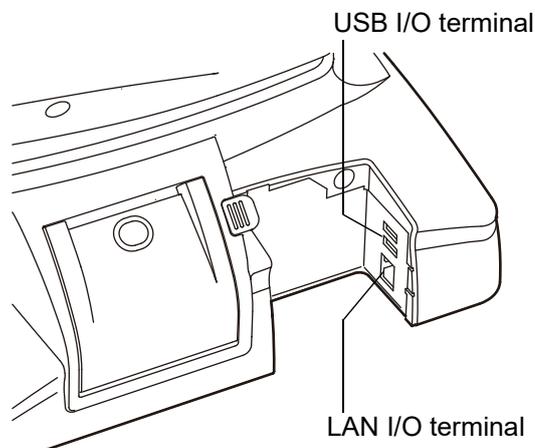
DATA OUTPUT

This product can be connected to a personal computer (PC) and other external devices via LAN.

1 Remove the External I/O terminal cover by pulling up as follows.



2 Connect the connection cable to the I/O terminal of the instrument.



- 3** Connect the other end of the connection cable to the PC, etc.
- 4** Replace the External I/O terminal cover.

IMAGEnet

- 1** Connect the connection cord to the LAN I/O terminal of the instrument.
- 2** Connect the other end of the connection cord to the IMAGEnet system.

 NOTE	<ul style="list-style-type: none"> • The connection cord for IMAGEnet is an IMAGEnet optional accessory. Prepare this cord prior to connection. For details on the IMAGEnet system, contact your dealer (on the back cover). • Do not insert or remove the LAN cable while the power of the instrument is ON. • Sometimes the connection is not done properly because of the characteristics of the hardware. Use the LAN cable specified by TOPCON.
---	---

DATA INPUT

 CAUTION	<ul style="list-style-type: none"> • Do not operate a touch panel during barcode data entering by barcode reader. If you enter data when tapping the button on the touch panel, the barcode may not be read normally. • Do not align, measure, or output data during barcode data entering by barcode reader. If you enter data during these operations, the barcode may not be read normally. • Take care not to enter the wrong patient information. It may be mistaken for information from another patient.
--	--

This product can be connected to a bar-code reader and other external devices via USB.

- 1** Connect the connection cable to the USB I/O terminal of the instrument.

 NOTE	<ul style="list-style-type: none"> • Please use a barcode reader with the following interface specifications. Connector shape: USB (type A) Interface: USB Power supply: USB bus power • Please connect USB devices while the power switch of this instrument is OFF. It may not correctly recognize USB devices if this instrument is in operation. • For questions about connections, contact your TOPCON dealer.
---	--

- 2** Connect the other end of the connection cable to the external device.

 NOTE	For questions about connections, contact your TOPCON dealer.
---	--

EXTERNAL PRINTER

This product can be connected to an external printer via USB.
External printer of the following can be used.

Manufacturer	Model name
CANON	CP900 CP910 CP1500

- Paper size of the external printer is able to select the L or postcard.
For the setting of the external printer, refer to the “EXTERNAL PRINTER” on page 75.

- 1** Connect the connection cable to the USB I/O terminal of the instrument.
- 2** Connect the other end of the connection cable to the external printer.
- 3** Select the printer to be use at the “printer” of “External printer” on the SETUP screen.
- 4** Select the paper size to be use at the “Paper size” of “External printer” on the SETUP screen.

 NOTE	<ul style="list-style-type: none"> • For questions about connections, contact your TOPCON dealer. • For the operations of the external printer, refer to the instruction manual of the printer to be use.
---	---

PRINTER PAPER SETTING

 CAUTION	<ul style="list-style-type: none"> • To avoid failure or potential injury, do not open the printer cover while the printer is in operation. • To avoid potential injury in case of malfunction, including a paper jam, be sure to shut off the power before attempting to repair it. • To avoid potential injury, do not touch the printer body including metal parts or the paper cutter, while the printer is in operation or when replacing the printer paper.
--	--

 NOTE	<ul style="list-style-type: none"> • Make sure to use the specified printing paper. If any printing paper other than specified is used, the printer might break, which could cause the product to be unusable. • If you insert the printer paper backwards, printing will not start.
---	--

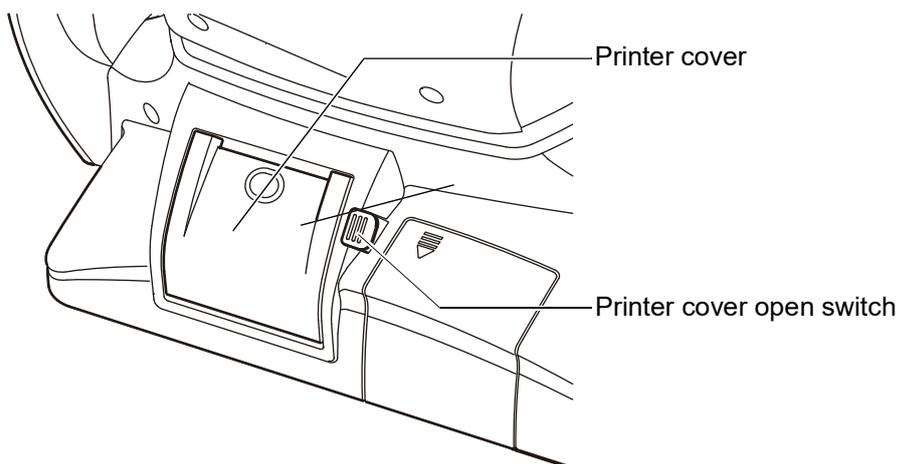
- For printing paper, use the following paper specified by TOPCON.

Item Name	Item Code
Printing Paper	448004001

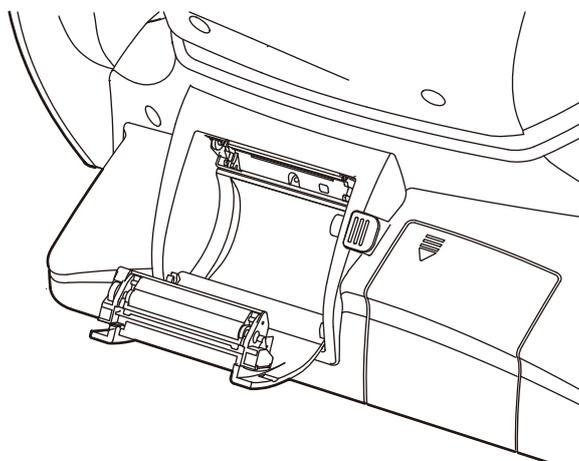
Product No.: TP-50K-J-R (manufactured by Nippon Paper Industries Co., Ltd.)
(Paper Width: 58mm, Roll Outer Diameter: ϕ 48mm or less)

When ordering any consumable, contact our agent where you purchased the product, or our particular department as indicated in this Instruction Manual with the Item Name, Item Code and Quantity.

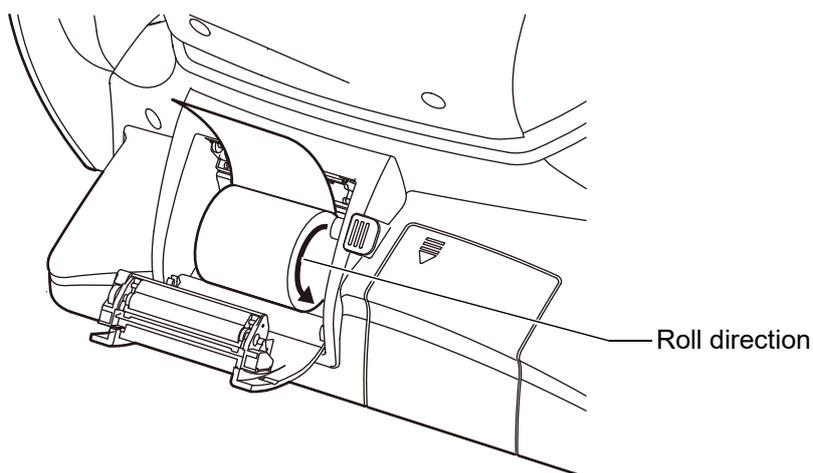
- 1** Press the Printer cover open switch to open the printer cover.



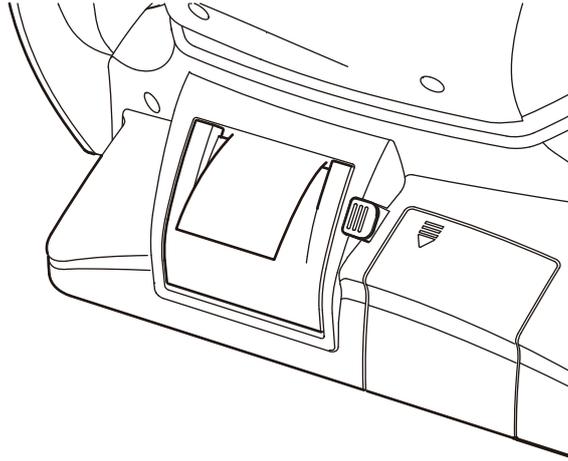
- 2** Open the printer cover to the limit.



- 3** Insert the printer paper in the direction shown below and pull out the paper end to your side by 7 to 8cm.



- 4** Bring the paper into the center, then close the printer cover.



NOTE

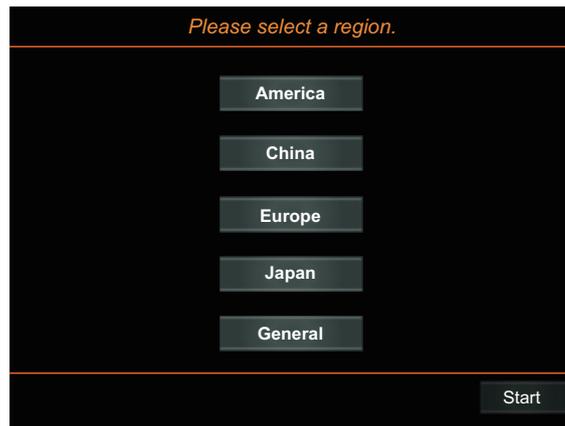
- If the printer cover is closed when the power is ON, the paper cut operation is carried out automatically.
- In case the printer cover is not firmly closed, printing will not start.

REGION SELECTION OF THE INITIAL STARTUP

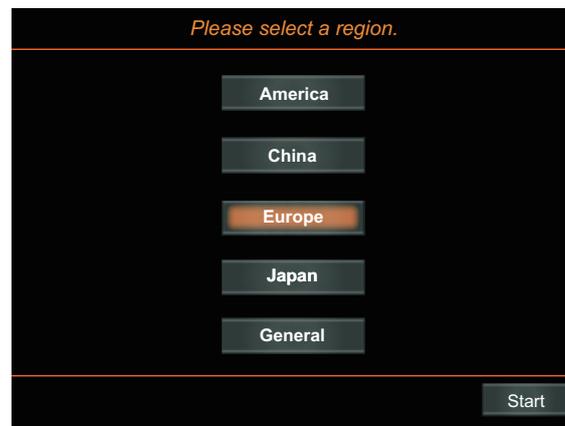
Please select a region in the initial startup of this instrument.

 NOTE	<ul style="list-style-type: none">• This operation is done only at initial startup.• An area besides America, China, Europe and Japan, please choose the “General”.• The setting of this operation can be reset at “Factory data Reset” of initial setting.
---	---

1 The region screen appears after displaying the startup screen.



2 Select one from America/China/Europe/Japan/General, and then tap the Start button.



3 The message of switch off/on is displayed. Then turn the POWER switch off, and turn the switch on again. The setting according to the selected region is applied to the instrument.



RECOVERY FROM POWER SAVE STATUS

This instrument adopts the power save system for saving electric power. When the machine is not operated for a set time, the control panel becomes a screensaver.

1 Tap the control panel or operate the control lever.

In a few seconds, the measurement screen is displayed and photography is enabled.

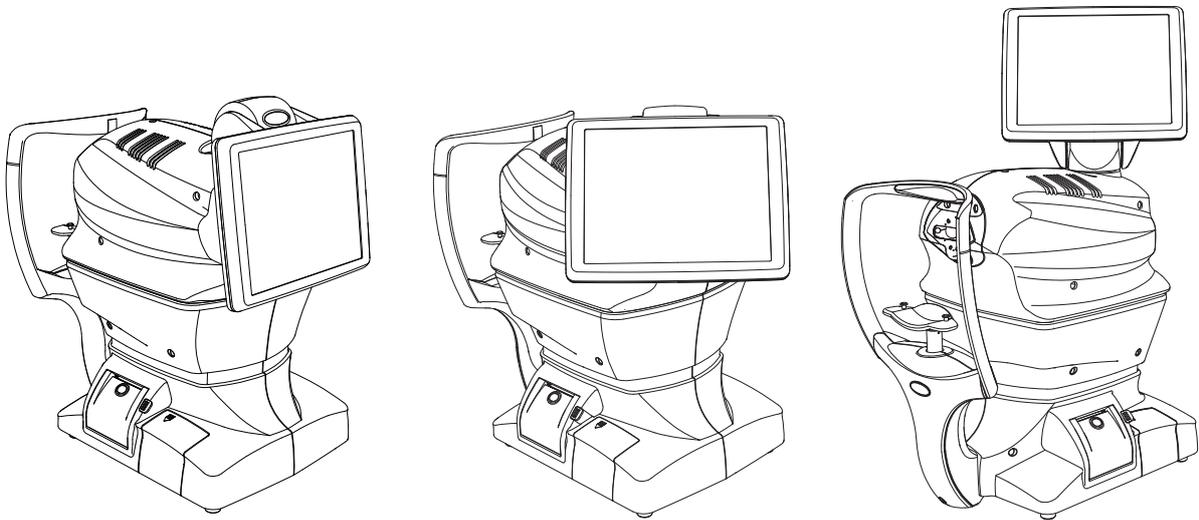


NOTE

The time to start the power save status can be changed in the initial setting "Auto power save" (see page 72).

ADJUSTING THE CONTROL PANEL POSITION

The control panel may be positioned by swinging and tilting the monitor to your desired position. Touching the control panel controls operations including chinrest movements, alignment and photography.



NOTE

- The layout of OD/OS is reversed according to the position of the control panel.
- The moving direction by tapping is changed according to the position of the control panel.
- The instrument moves in the direction which continued pressing on a control panel at any control panel position.

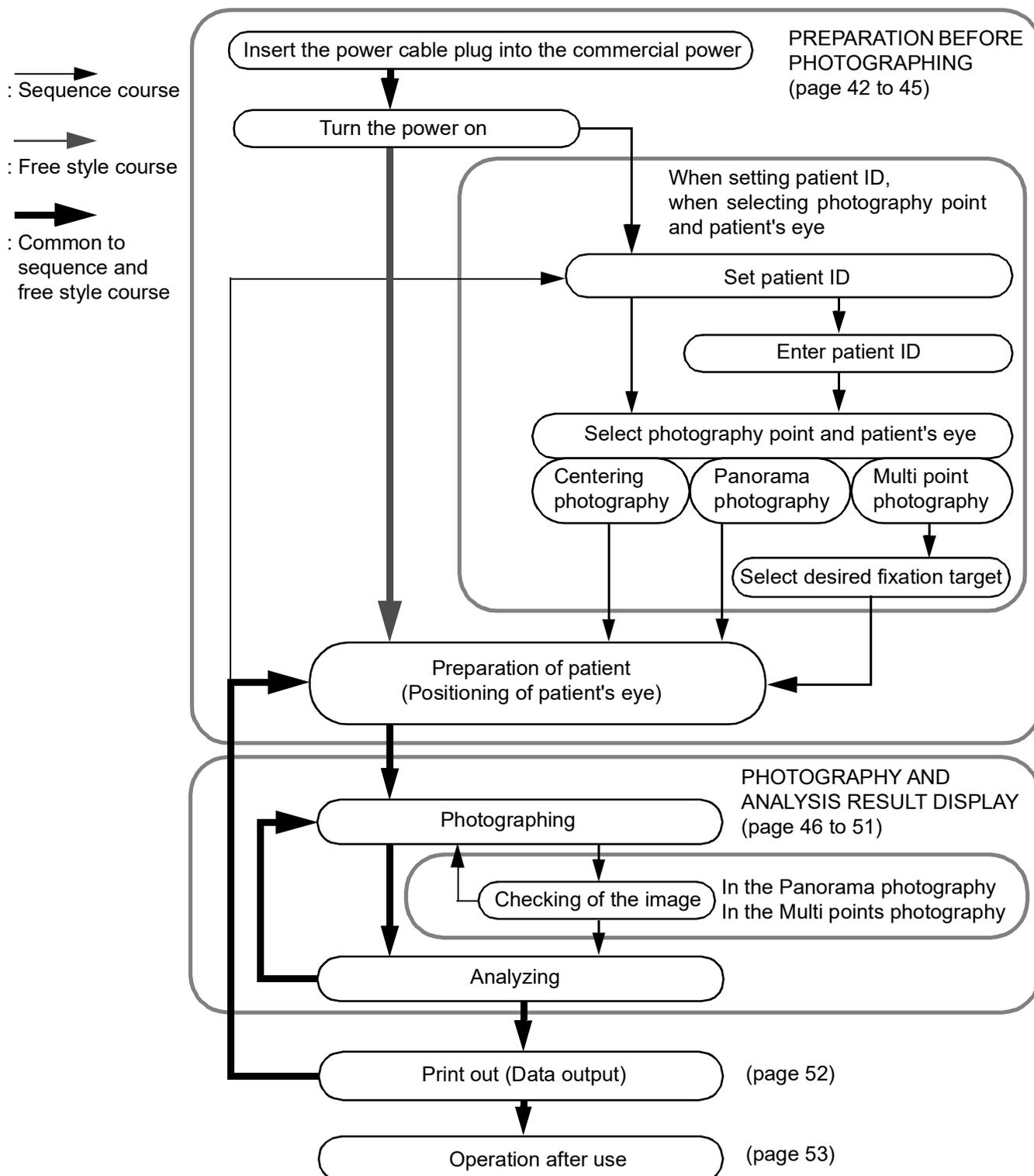


BASIC OPERATIONS

OPERATION FLOW CHART

Two different operation flows are available sequence course and free style course. Before shipment, default setting is sequence course.

- Sequence course Setting Patient ID, photography point and patient's eye is required before photographing. (In current chapter)
- Free style course..... Photographing is allowed when turning on. (See P.54)



PREPARATION BEFORE PHOTOGRAPHING (SEQUENCE COURSE)

 NOTE	<ul style="list-style-type: none"> Do not put the patient's chin on the chinrest until the power is on. If room temperature becomes low at 10°C or less in the winter, after turned the power switch on, warming up is necessary before use. Image quality may be influenced for low temperature.
---	---

TURN THE POWER ON

- 1** Insert the power cable plug into the commercial power (the 3-pin AC grounding receptacle.)
For the details of connection, refer to “CONNECTING POWER CABLE” on page 33.
- 2** Press on the **POWER** switch.
Make sure that the title screen is displayed and then the patient screen is displayed.
 - The patient screen is shown for a while.

SET PATIENT ID

Patient ID input change button



Next button

Patient screen for DICOM work list

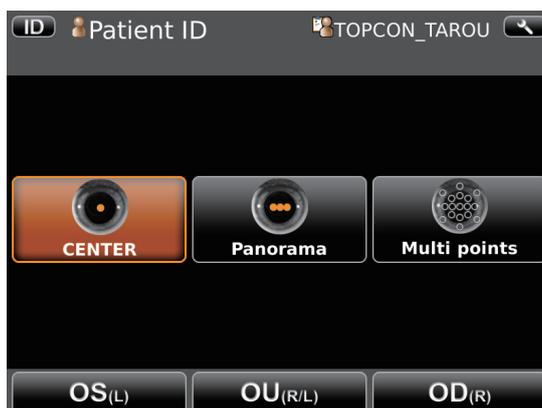
Patient list button



Next button

Patient screen for ID input

- When selecting the patient from DICOM work list, select the patient on the list, tap the **Next button**.
To enter the ID, enter patient ID by use of **Input button**, finally tap the **Next button**.
(Refer to page 20 regarding how to input ID.)
Photography setting screen is shown.



SELECT PHOTOGRAPHY POINT AND PATIENT'S EYE

- 1 Tap the photography point setting button.



CENTER button Centering photography is carried out.



Panorama button..... Panorama photography that is to photograph 3 points around the center is set.



Multi points button Multi points photography that is to photograph specified circumference position is set.

- If the is selected, select the photographing position on the Photographing position selecting screen. For the details see the 23 pages.

- 2 Tap the button to select patient's eye.



OS(L) button Photographs left eye only in the selected photography point.
If selection is complete, moves to capture screen.



OU(R/L) button... Photographs two eyes (R/L) in the selected photography point.
If selection is complete, moves to capture screen.



OD(R) button..... Photographs right eye only in the selected photography point.
If selection is complete, moves to capture screen.

- 3 Move to the capture screen.



NOTE

In the sequence course, changing the photographing points is impossible during photographing. If the changing is necessary, you have to photograph in free style course.

PREPARATION OF PATIENT

**CAUTION**

- To avoid electric shock, do not touch the external connection terminal and the patient at the same time.
- To avoid injury, do not insert fingers under the chinrest. To avoid injury when moving the chinrest down, be careful not to catch the patient's finger. Tell this to the patient, too.
- To avoid injury when operating the machine (for measurement and control panel operation), be careful about the cover not to catch fingers of the patient. Tell this to the patient, too.

**NOTE**

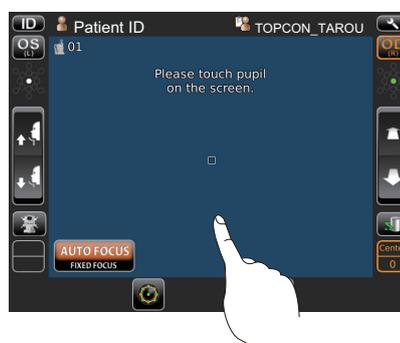
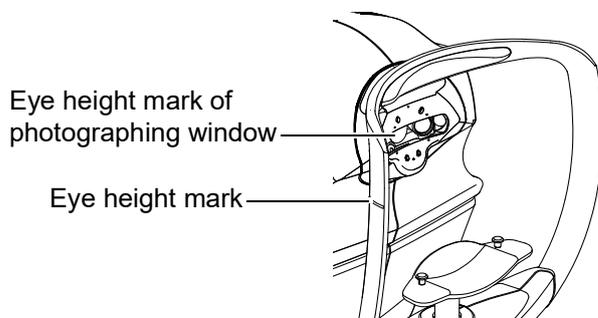
- Adjust the height of the adjustable instrument table so that the patient can sit on the chair comfortably. Otherwise, correct measurement values may not be obtained.
- When operating the instrument (for measurement and control panel operation), be careful that the instrument does not touch the patient's lip or nose. If touched, clean the instrument following "CLEANING THE FOREHEAD REST AND CHIN REST" on page 99.
- If no patient ID is registered, a "patient No." is assigned and displayed automatically in order of examination. However, a "patient No." is not displayed if the "header" is set to "OFF".

1

Check the capture screen.

2

Make sure that Photographing window is at the height of the eye height mark. Move the photographing head until photographing window is at the height of the eye height mark, if photographing window is above the eye height mark press the lower side of the control panel display, or if it is beneath the eye height mark press the upper side of the control panel display.

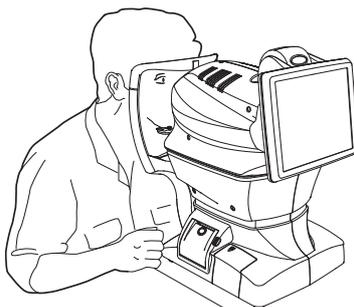
**3**

Have the patient sit in front of the instrument.

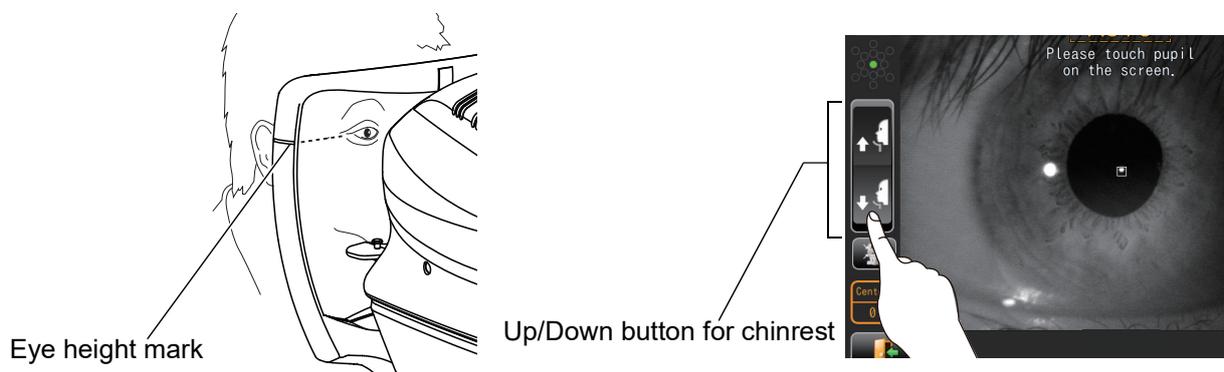
4

Adjust the adjustable instrument table or the chair height for the patient to put his/her chin on the chinrest comfortably.

- 5** Place the patient's chin on the chinrest and check that his/her forehead is touching to the forehead rest.



- 6** Press the **UP/DOWN button** to adjust the chinrest height until the eye height mark of the chinrest reaches the same height as the patient's eye. At this moment, confirm that the height mark of the photographing window is at the height of the patient's visual line.



PHOTOGRAPHY AND ANALYSIS RESULT DISPLAY

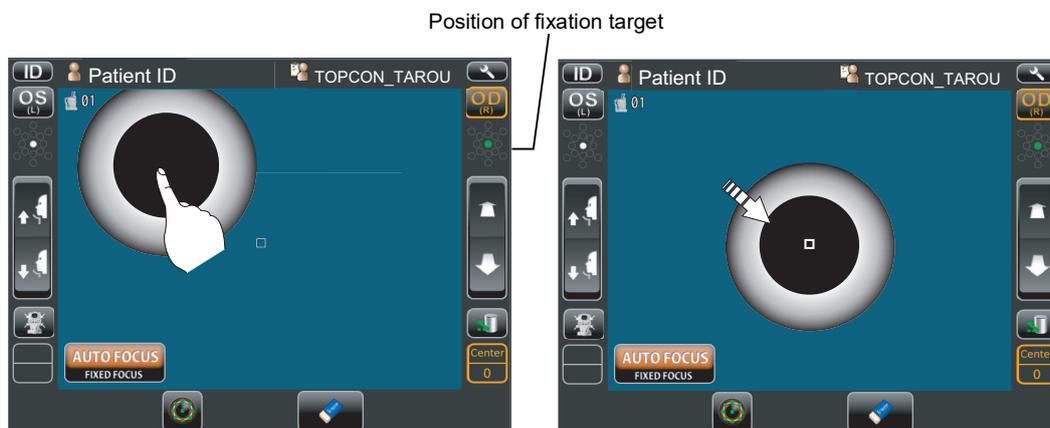
NOTE

- Photographing may not be possible, in case the eyelid and the eyelashes cover the pupil. If this occurs, the operator should tell the patient to open their eyes as wide as possible, or lift the eyelid to allow for measurement.
- Photographing may not be possible due to frequent blinks or existing abnormalities in the corneal surface caused corneal disease etc. In this case, select manual mode.
- When operating the instrument, be careful that some parts of the instrument do not touch the patient's nose. If touched, clean the instrument following "CLEANING THE FOREHEAD REST AND CHIN REST" on page 99.
- If the patient is wearing make up on the eyelid or around the eyelid using glitter, the auto alignment may not function properly. In this case, select manual alignment.
- If area far away from the pupil is tapped, the instrument may touch the patient's nose due to auto alignment failure.

ALIGNMENT AND PHOTOGRAPHY

Alignment can be operated from the control panel.

- 1** Have the patient look at the fixation target (blinking in green.) in the photographing window. If blinking in green stops tell the patient suppress so to suppress eye blinking approx.3 seconds. (Photographing is carried out at this time.)
- 2** When the pupil is displayed, tap the area around the pupil. The photographing head moves to display the pupil image and alignment dot on the center of the screen.

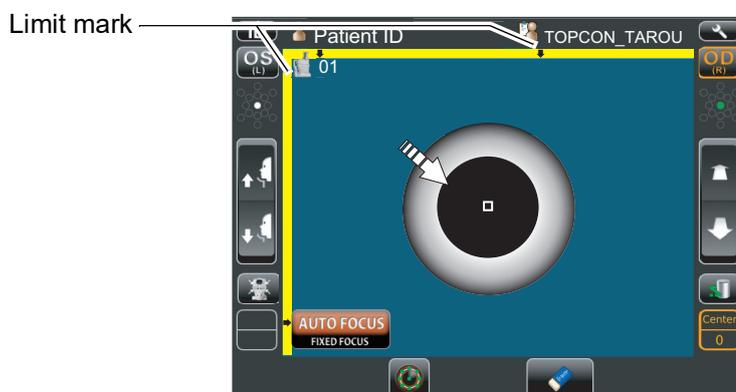


- 3** Alignment starts automatically, and photographing is performed.

NOTE

- When "Please touch pupil on the screen." is displayed, please confirm if the patient's eye fits normal conditions for measuring. Then tap the pupil on the control panel again.
- When the alignment status has continued for more than 10 seconds, the focus mode is changed to FIXED FOCUS mode. (See P.60) When the alignment status has continued for more than 10 seconds after changed to FIXED FOCUS mode, "Please touch pupil on the screen" appears and the operation stops. Tap the photographing Head Forward/Backward button to focus. Then tap the pupil on the control panel again.

- When the photographing head has reached the limit of movement (vertical/lateral directions), a yellow-colored limit mark appears on the control panel's top, showing it is the movement limit in that direction. Tap the display, move the photographing head to the position where aligning is possible.



NOTE

- The limit display is shown also when the patient's face position is incorrect. Check that the patient's face is in proper position, then move the photographing head.
- When the photographing head is at the limit of movement in the forward direction, "TOO CLOSE" is displayed, and when it is at the limit of movement in the backward direction, "TOO FAR" is displayed. Using the photographing Head Forward / Backward button, move the photographing head to the position where aligning is possible.



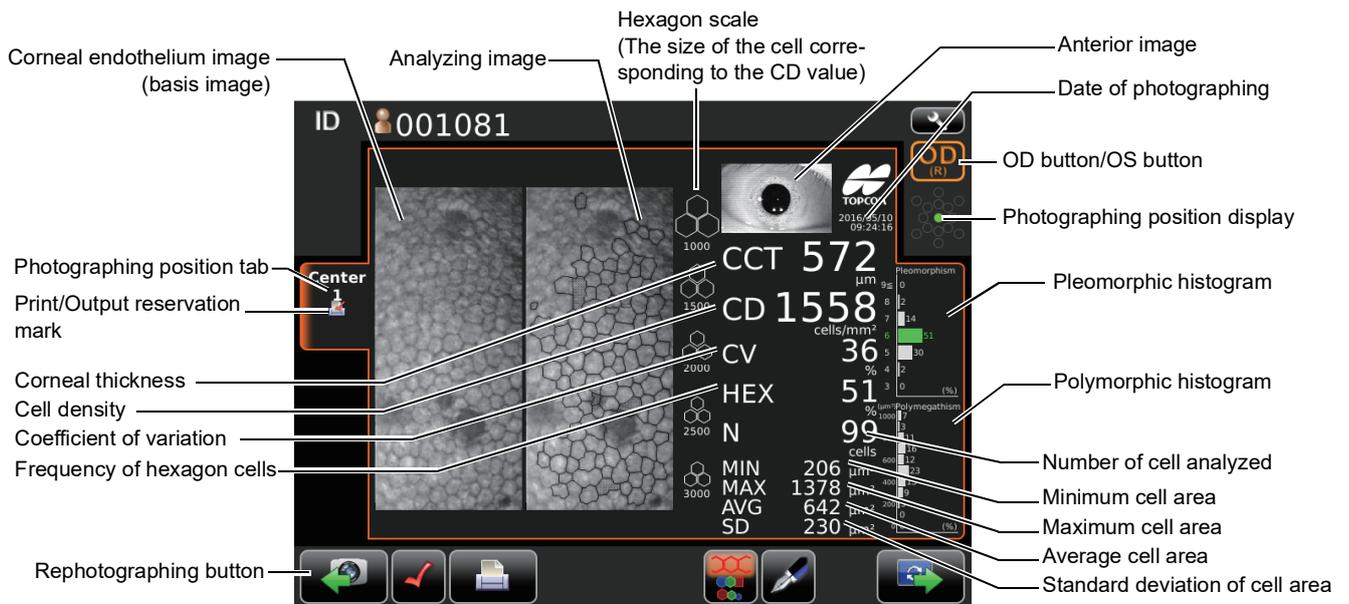
Limit of movement in the backward direction



Limit of movement in the forward direction

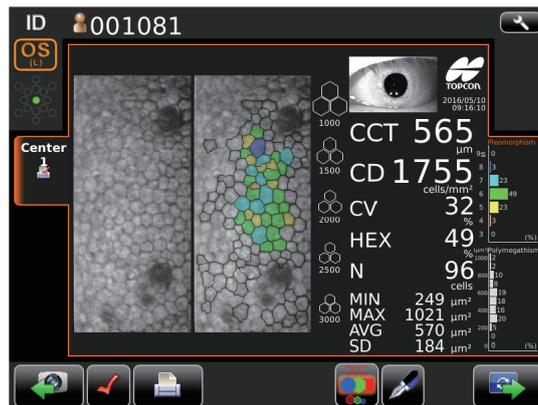
- For manual alignment, refer to page 50 "IN MANUAL ALIGNMENT".

Results of Photography and analysis.

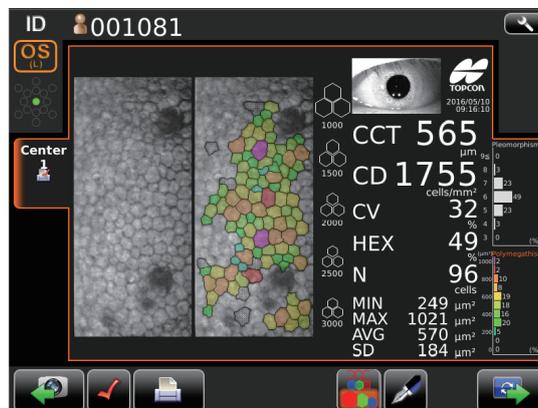


- If photography is required again, return to the capture screen by tapping Rephotographing button. Then you can photograph again.
- The analyzing image is classified in color according to number of angle of cell and area of cell by tapping Overlay button.

The analyzing image is classified in color according to number of angle of cell

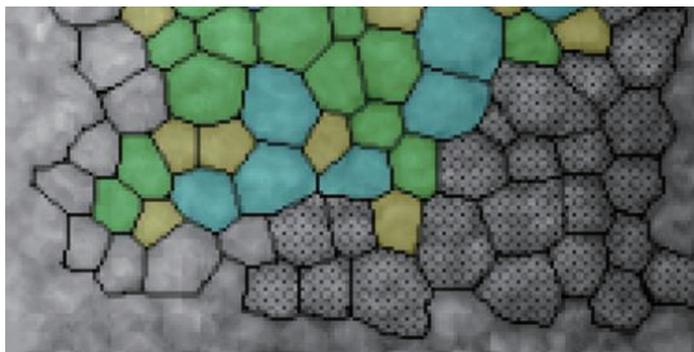


The analyzing image is classified in color according to area of cell



- The cell that is no colored and displayed with black boundary line and dots in a cell is excluded from analyzed value calculation.
- The cell that is no colored and displayed with only black boundary line is excluded from a calculation for the pleomorphic histogram. (The cell is displayed only the case of “The analyzing image is

classified in color according to number of angle of cell". If calculating cell area, it is calculated including the cell.)

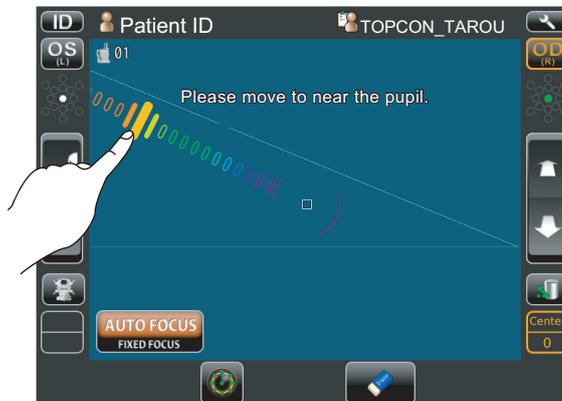


4 Under "Panorama photography" is set, the procedure is follows; "photographing" - "check the photographing result" - "photographing" - "check the photographing result", then repeat same procedure. Photographing is performed at three points as center, ear side, and nose side. Under "Multi points photography" is set, the procedure is "photographing" and "check the photographing result", and repeat same procedure according to selected points.

- When "Auto analyze" (see P.73) is set to OFF, the analysis is not performed automatically after photographing. In this case, check the photographing result after photographing is finished, analyzes by tapping the analysis button. If analyzing is not required, return to the capture screen immediately by tapping rephotographing button.

IN MANUAL ALIGNMENT

To keep pressing on the screen, the instrument moves to the direction from center of screen to the pressed point.
 It is possible to change the direction by dragging on the screen, too. The instrument does not move even if you press around center of screen without the bar.



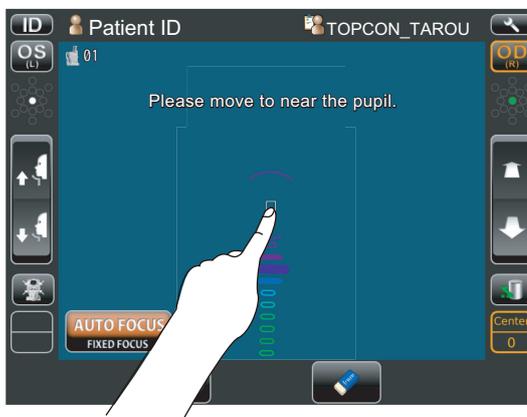
Moving speed is changed according to the distance between center of screen and pressed point.

Moving speed is higher than away from a screen center.

 **NOTE**



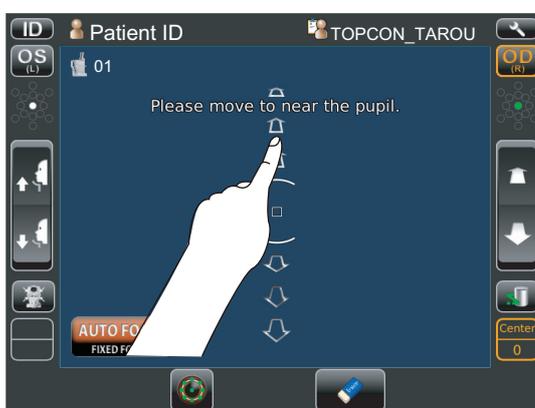
During vertical/lateral directions movement, the movement mode is changed to back /forth by tapping (at one second) the center of screen.



 **NOTE**



Under Back/forth movement mode, it is possible to move like the arrow of the screen.



PRINT-OUT OF PHOTOGRAPHING DATA

NOTE

- To avoid a paper jam in the printer, do not feed the paper if it is partly cut or wrinkled.
- To avoid discoloring of the printer paper (particularly the recording area) during storage, use a polypropylene bag and not one containing plasticizer (PVC, etc.).
- To avoid discoloring of the printer paper (particularly the recording area) after pasting, use water-soluble glue and not one containing solvent.
- Since the printer paper is thermosensitive, it is not suitable for keeping records for a long period. If necessary, prepare copies separately.

This instrument can print out photographing data by internal printer.

1

Make sure that **Print/Output button**  is displayed on Photographing result screen.

- If Panorama photography, Multi points photography and Binocular photography is selected, **Print/Output button** does not appear until all specified photographing is completed.

2

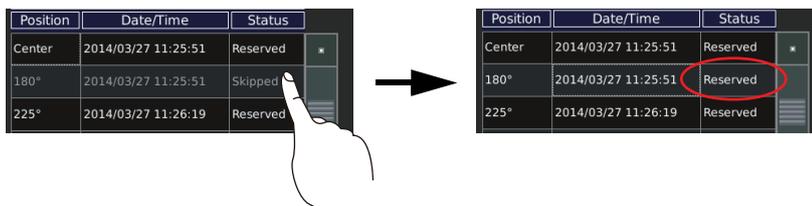
List of printing items screen is displayed.

- What is shown in the “Status” column
Reserved: Data to be printed
Skipped : Data skipped over in printing

- * The data for which photographing is skipped is set as excluded from printing at initialization. (Displayed in gray)
- * Output/not output can be selected by means of tapping the list of printing items to change “Reserved”/“Skipped”.



OS(L)			OD(R)		
Position	Date/Time	Status	Position	Date/Time	Status
Center	2014/03/27 11:26:40	Skipped	Center	2014/03/27 11:25:51	Reserved
135°	2014/03/27 11:27:34	Reserved	180°	2014/03/27 11:25:51	Skipped
			225°	2014/03/27 11:26:19	Reserved

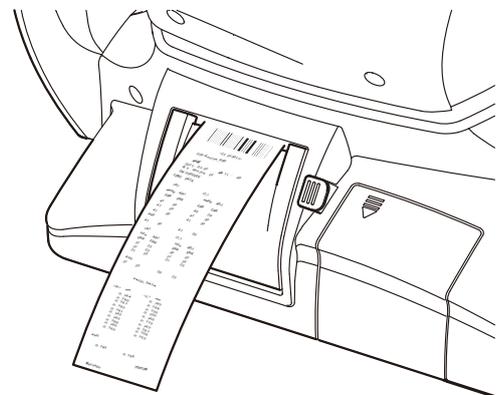


Position	Date/Time	Status
Center	2014/03/27 11:25:51	Reserved
180°	2014/03/27 11:25:51	Skipped
225°	2014/03/27 11:26:19	Reserved

Position	Date/Time	Status
Center	2014/03/27 11:25:51	Reserved
180°	2014/03/27 11:25:51	Reserved
225°	2014/03/27 11:26:19	Reserved

3

Tap the **Print/Output button** on the List of printing items screen.
Photographing values on the List of printing items screen are printed out.



**NOTE**

- When a red line is printed at the end of the printer paper, replace it with a new one. For details about the replacement of printer paper, see “PRINTER PAPER SETTING” on page 36. 58mm wide printer paper is recommended. For the printer paper, see “ORDERING CONSUMABLE ITEMS” on page 94.
- “CLOSE PRT COVER” is indicating that the printer cover is left opened, ensure that the printer cover is completely closed.

DATA OUTPUT

If personal computer and external devices are connected with this instrument, outputting data and printing out are simultaneously performed by tapping the **Print/Output button**.

OPERATION OF AFTER USE

- 1** Tap the **End button** on the control panel.



The message of “Turn off the unit?” is displayed.

- 2** Tap the “YES”. Return the chinrest and photographing head to the last position.

The message of “Please don't turn the main switch off until the unit stops.” is displayed on the control panel.

The operation is complete, then the message of “The unit stops completely. Please turn the main switch off.” is displayed.

- 3** Turn the **POWER** switch to off.

**NOTE**

When external devices are connected to external I/O terminals, turn off the power of these devices too. (If power switch is provided.)

- 4** Unplug the power cable from Commercial power (the 3-pin AC inlet with grounding).

**NOTE**

When the instrument is not used for a long period of time, unplug the power supply cable, and detach the cable connected to the external I/O terminal.

OPTIONAL OPERATIONS

FREE STYLE COURSE PHOTOGRAPHY

In the free style course, it is possible to capture an eye as soon as the power turns on; selecting the patient's ID, photography point or patient's eye is not required.

 NOTE	<ul style="list-style-type: none"> • To change to free style course form the sequence course the setup screen is used. • Regarding how to change, see P.68-72. • In free style course, it is possible to set photographing position as desired. • As it is impossible to keep the result of desired position and panorama photography simultaneously in free style course; print/output either result then repeat the photographing procedure from the beginning.
---	---

- 1 Insert the power cable plug into the commercial power (the 3-pin AC grounding receptacle,) press on the **POWER switch**. Make sure that the title screen is displayed and then the capture screen is displayed.



- 2 Tap the **Photographing position selecting button** to change the position.



Photographing position selecting button

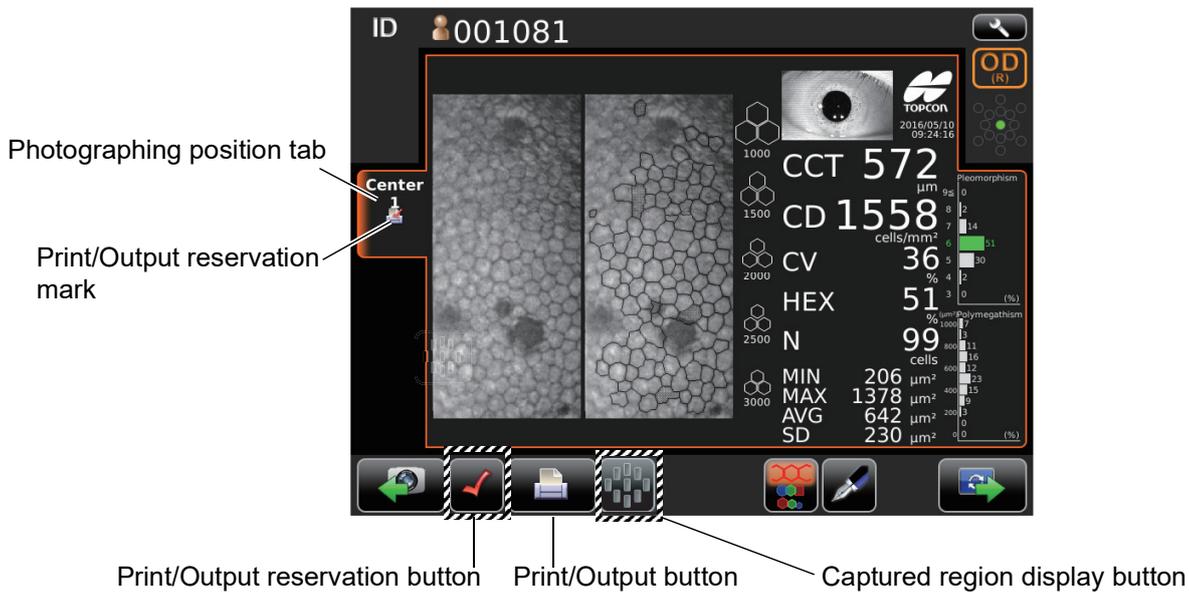
- 3 Photographing position selecting screen appears. Tap the desired position on the screen, and change the L/R eye by OS/OD button if necessary. If Panorama photography is required, tap the **Panorama** button. For the detail of Panorama photography, see P.56.



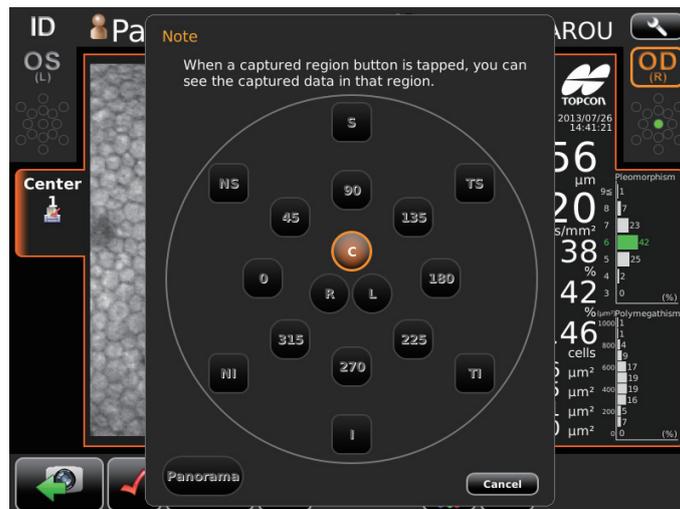
OS/OD (L/R) button

Panorama button

- 4 Start Preparation of patient (Refer to P.44 “PREPARATION OF PATIENT”)
- 5 Carry out Photographing. (Refer to P.46 “ALIGNMENT AND PHOTOGRAPHY”)
Results of Photography and analysis are displayed.
- 6 If photographing of the required position is complete, select the result for printing position.



Tap the Captured region display button, the chart of all captured region is displayed. If tapping each button of region, each analysis result of region is displayed for checking.



- 7 Tap the Print/Output reservation button while the specified image for printing displays on the screen.
Print/output reservation mark appears on the photographing position tab, then the print reservation is complete.
- 8 Tap the Print/Output button to print the reservation result of photography.

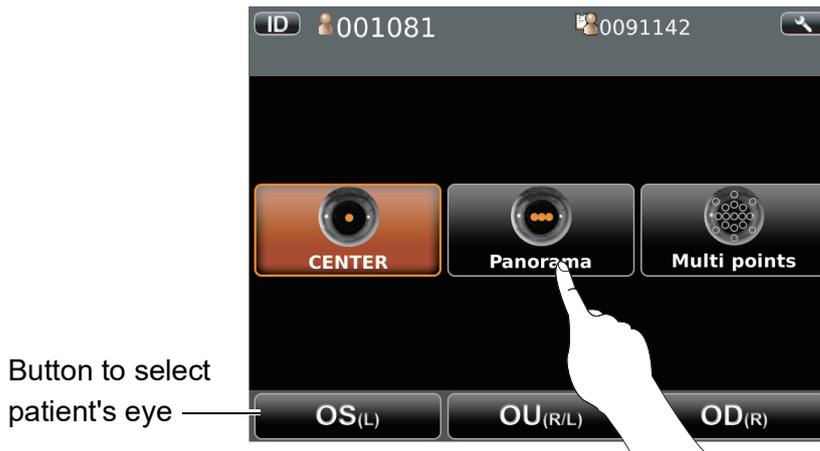
PANORAMA PHOTOGRAPHY

Photograph 3 points-center, ear side and nose side. Those images are combined automatically and observation of large area can be performed.

- In the case of sequence course, preparation and photography are carried out as the following procedure.
- In the case of free style course, preparation and photography are carried out from following procedure **4** after tapping the Panorama button in the Photographing position.

1 Set Patient ID. (Refer to page 42)

2 Tap the Panorama button.



3 Select the patient's eye by tapping the button to select patient's eye. Then move to the screen for observation.

4 Please prepare to photograph for patient. (Refer to page 44)

5 Have the patient look at the fixation target (blinking in green) in the photographing window. If blinking in green stops tell the patient so to suppress eye blinking approx.3 seconds.

6 Tap the pupil on the screen.



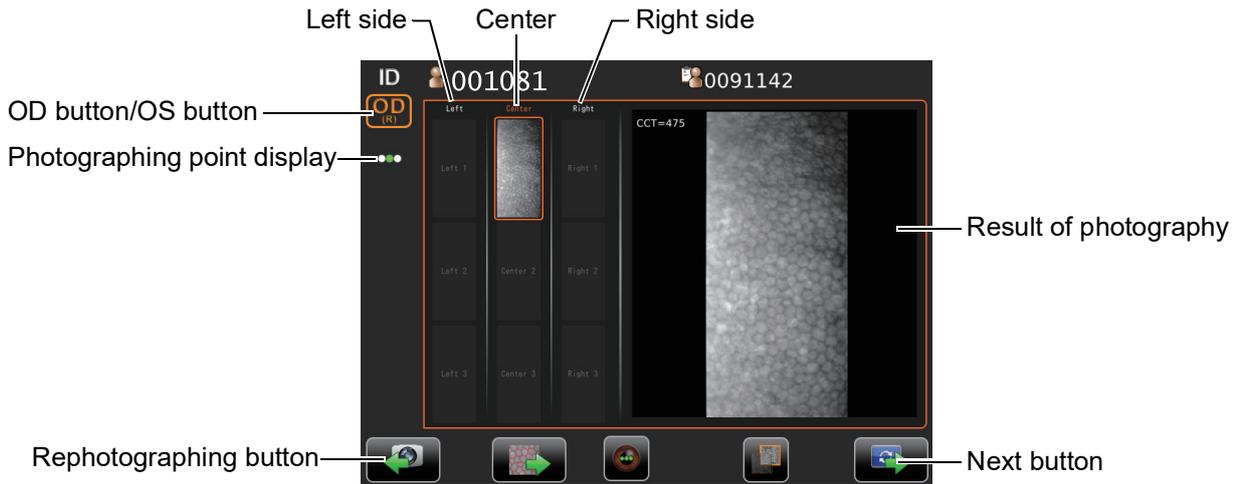
The alignment is performed automatically and photographs.

- Changing the patient ID or patient name is impossible after tapping the screen.

7 Preview of result of photography is shown.

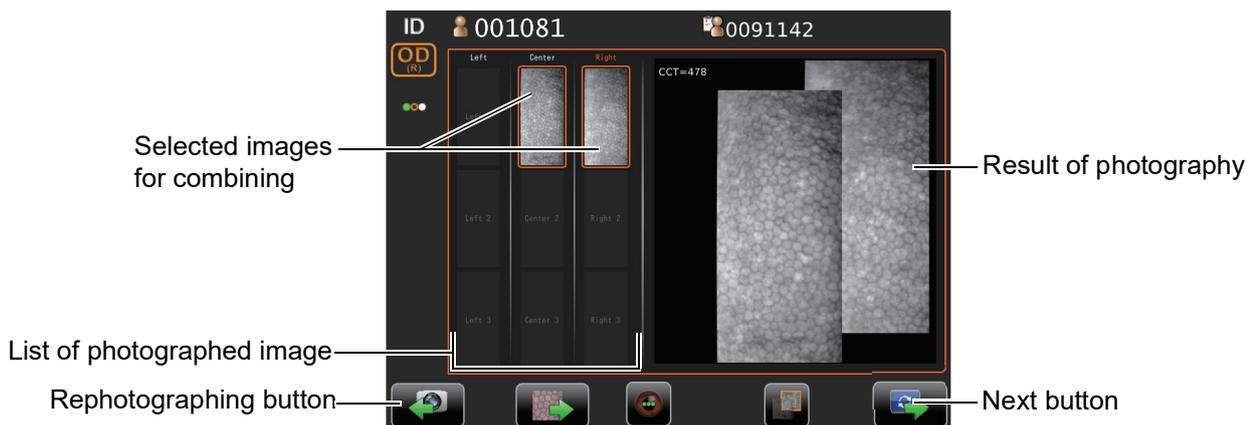
Until photographing next point, the patient has a break.

8 Check the result of photography. If photography is required again, tap the **Rephotographing** button.



9 Tap the **Next button** to photograph next position.

10 The capture screen is shown. Photograph the same manner in Step 4-7 (page 56). The image is displayed in combined image with previous one.

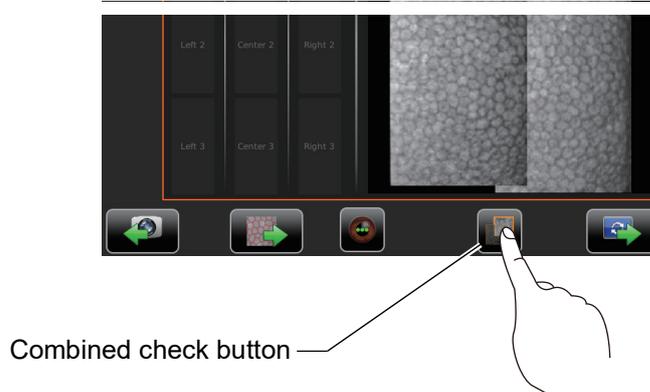


- If rephotographing is performed and several images are shown in the list of photographed image, it is possible to select images for combining by tapping desired images.

11 Check if the combined images overlap correctly.

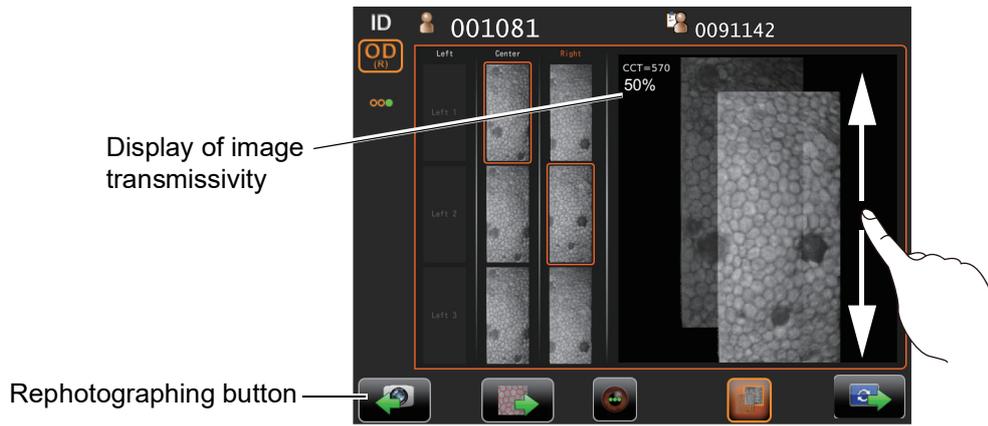
How to change transmissivity of center image in the result of photography is the following (1) or (2) procedure.

(1) Tap the **Combined check button**.



When the **Combined check button** is turned in orange, the center image is displayed at 50% transmissivity.

(2) Drag your finger up or down on the image of result of photographing.

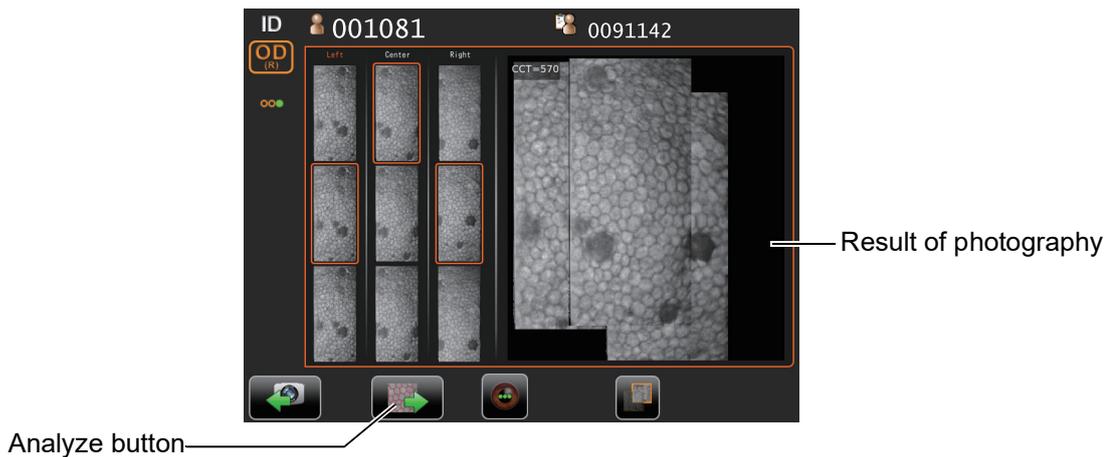


The desired transmissivity can be applied to the centered image.

12 Check the combined area of the image overlaps correctly by changing transmissivity of center image.

- If the images overlap correctly, move to step **12** by tapping **Next button**.
- If not, select another image from the photographing list or perform rephotographing by tapping the **Rephotographing button**, then check new combined image again.

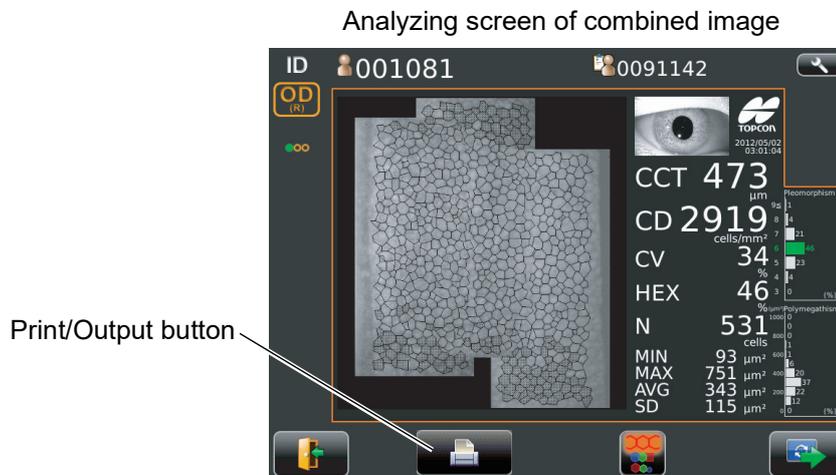
13 Photograph the third point and check the photographing image in the same manner.



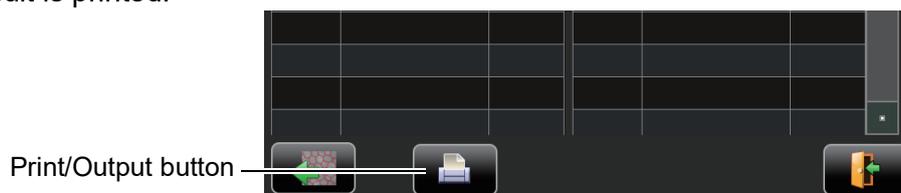
- To select the part for rephotography, tap the **Photography part selecting button**. Tap **R button** (right), **C button** (center) or **L button** (left) in the window, rephotographing the part to be selected is possible.



- 14** Tap the **Analyze button**, “Do you want analyzed using the combined image?” is displayed. If tapping “Combined image”, the analyzing image is displayed in combined image.
- The analyzing of using combined image is available after photographing 2 points.
 - It is possible to analyze only one shoot of center image which is not combined.
- 15** Check the analyzing result and if required tap the **Print/Output button** to print/output the result.



- 16** The List of printing items screen is displayed, then tap the **Print/Output button**. The analyzing result is printed.

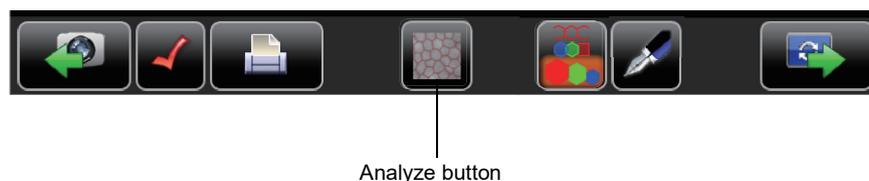


- 17** The message of “Are you sure to start next measurement? Please select whether to input new patient ID or not.” is displayed.
- If “New ID” is selected, moves to work list or ID input screen.
 - If “Same ID” is selected, the measurement is continued under same patient.

PHOTOGRAPHING WITHOUT AUTO ANALYSIS

After photographing, it is possible to skip auto analysis procedure. If you need to rephotograph frequently, this function is convenient.

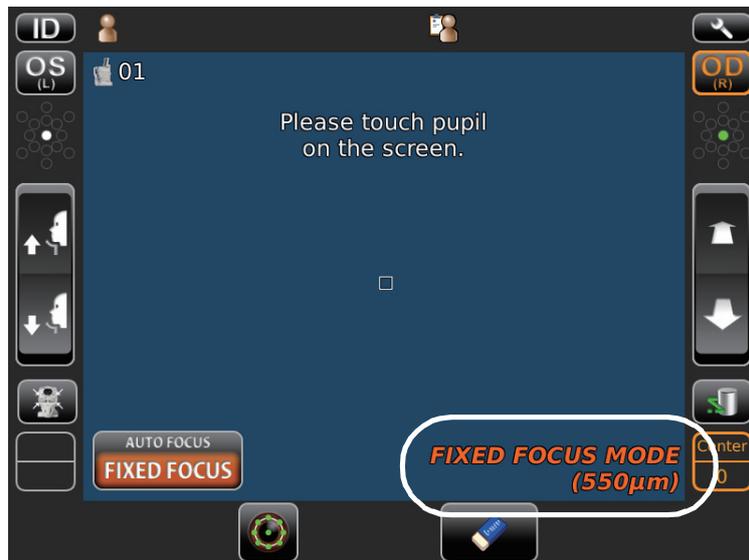
- It is necessary to change the setting in the setup screen. (See P.73 “Auto analyze”)
- Since the analysis is not performed automatically, select one of the photographing data, and then analyze a cell. It is possible to perform the analysis of the entire endothelium image by tapping “analyze button” or to perform the cell analysis of specified area (see P.62).



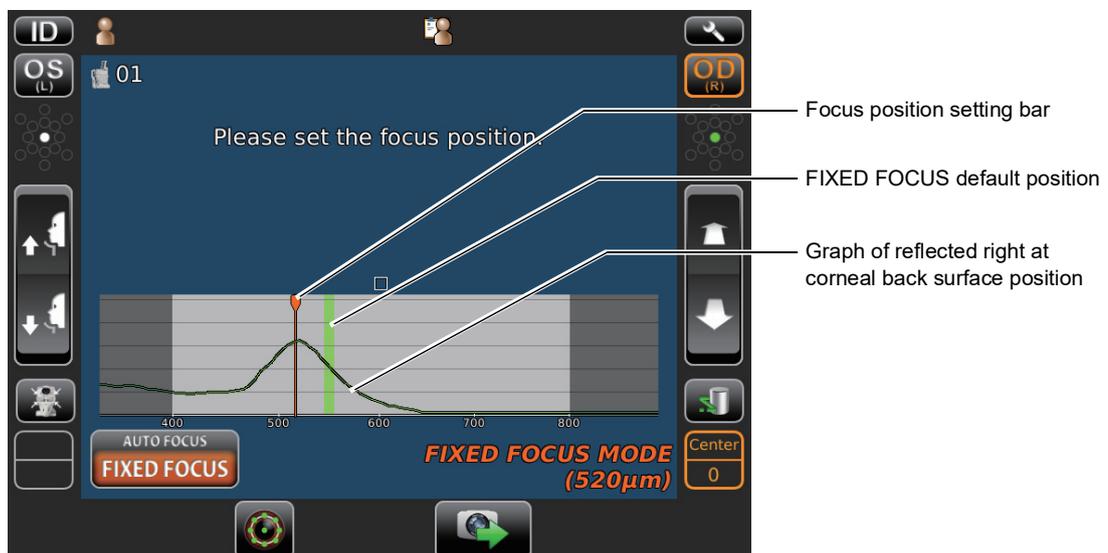
PHOTOGRAPHING IN FIXED FOCUS MODE

Under FIXED FOCUS mode, photographing is forcibly performed in fixed distance from a corneal surface, even if auto alignment cannot be performed for reasons for weak reflected light on the corneal back surface etc.

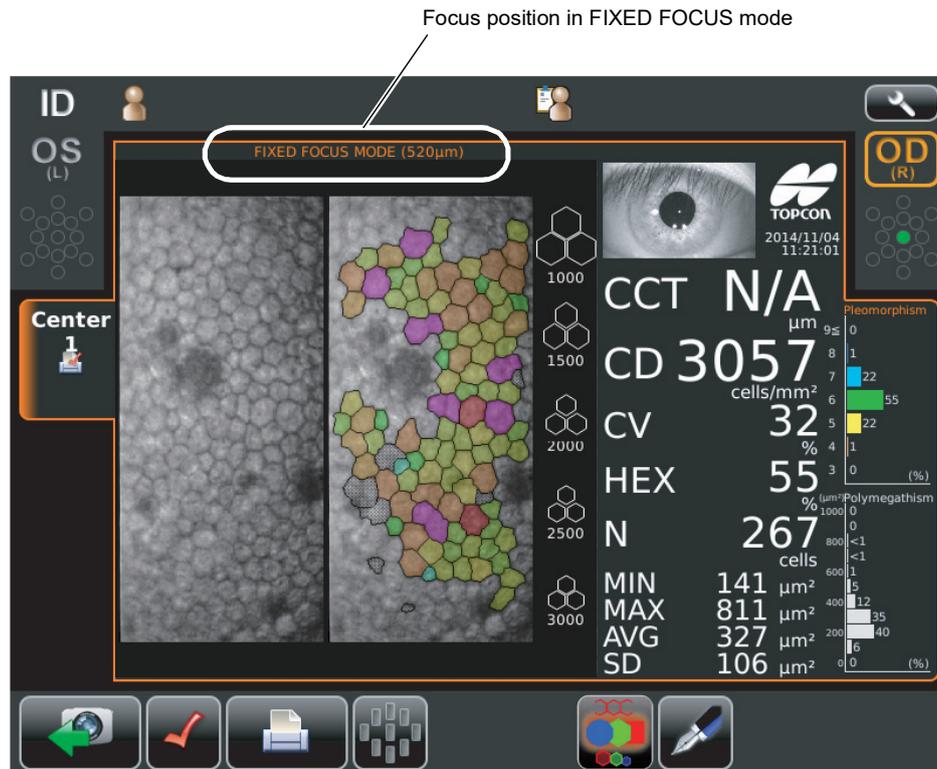
- 1 Tap the **AUTOFOCUS/FIXED FOCUS button** in the bottom left corner of screen.
If it changes in fixed focus mode, the display of "Fixed focus mode" and the default position appear in the bottom right corner of screen.



- 2 If you touch the pupil on the screen, auto alignment starts.
- 3 After auto alignment finishes, the signal of reflected light at the corneal back surface position (400-800μm) is displayed by a graphic chart.
The orange bar that shows a focus position moves to set a photographing focus position by tapping the graphic chart.
If a corneal back surface can be detected by the signal, a focus position is set automatically.
If not, the focus position is set to the FIXED FOCUS default position.
If manual setting of a focus position is required, set the focus position at the center of signal curve of the chart.



- 4 After the focus setting, by touching the pupil which you can see outside of the graphic chart, align to the focus position that has been set up and perform photography.
- 5 In fixed focus mode photography corneal thickness measurement is not performed, so that CCT value is displayed as N/A. The set-up focus position is also displayed.



DISPLAYING THE PATIENT ID (PATIENT No.) OR OPERATOR ID

A patient ID or operator ID of up to 13 characters can be input and displayed on the control panel and printout.

If no patient ID is registered, a “patient No.” is assigned automatically in order of examination. However, a “patient No.” is not displayed if the “header” is set to “OFF”.

FOR DICOM WORK LIST

- 1 Select a specified patient from the list. If there is no patient in the list, please tap the to update information.
- 2 Tap the so that the selection is complete.
 - In ID input method, can be used to change to work list method.

FOR ID INPUT

- 1 Tap the keyboard on the display to enter the ID.
- 2 Tap the so that the selection is complete.
 - In work list method, can be used to change to ID input method.
 - Keyboard layout can be changed qwerty/ten key by means of keyboard changeover button.

SPECIFYING THE AREA OF CELL ANALYSIS

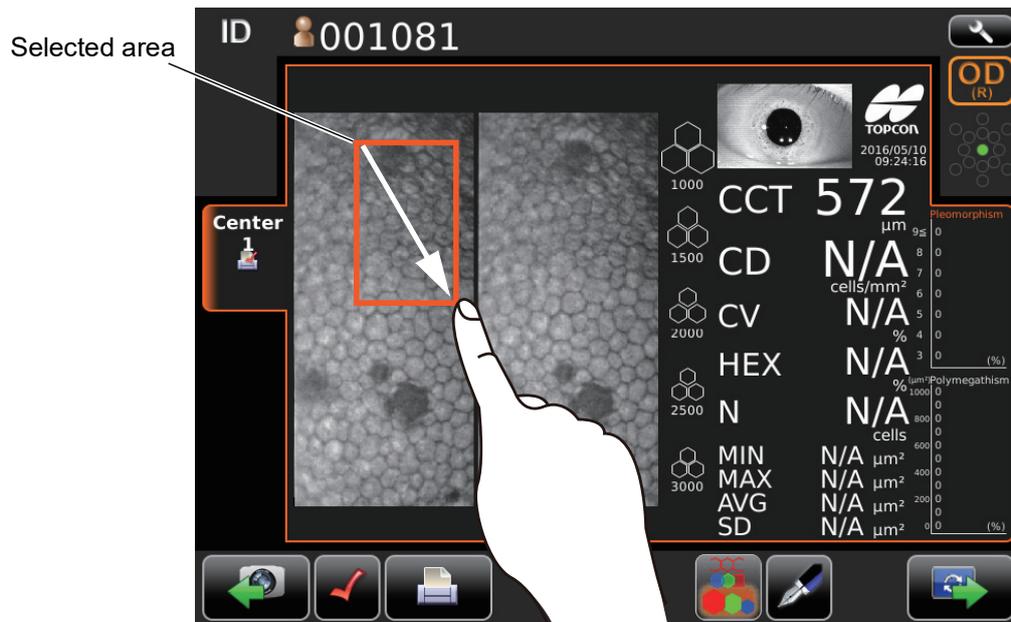
It is possible to analyze by specifying the part of the area in the photographed image.



NOTE

This function is only available for single eye photography. It cannot be used for panorama photography.

- 1 On endothelium image display (basis image), drag your finger to draw a rectangle in the area you want to select. The selected area is indicated in orange while dragging.



- 2 Analysis of the selected rectangular area is performed.



NOTE

If tapping on the endothelium image display (basis image) by your finger, perform the analysis of the entire endothelium image.

- 3 If you want to cancel the operation, return the finger to the start point of the drag.

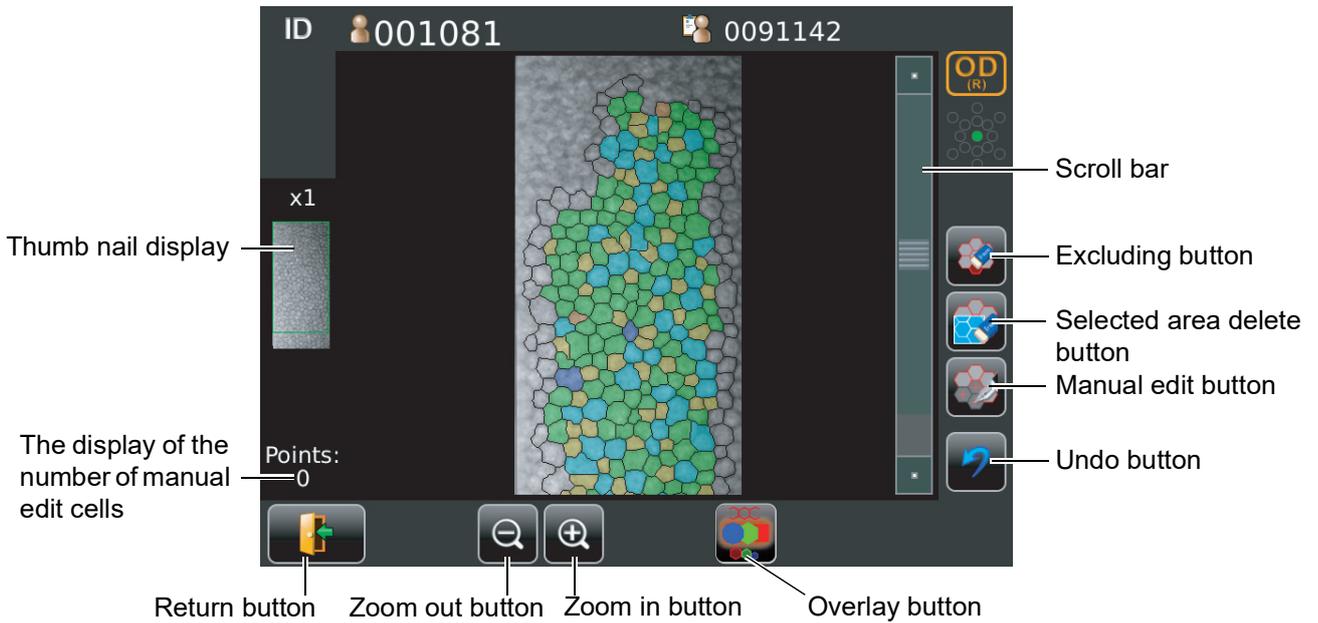
CELL ANALYSIS IN EDITING MODE

Use of a stylus pen is recommended to edit.

1 Make sure that Photographing result screen is displayed.



2 Tap the manual editing button . Manual editing screen is displayed.



Thumb nail displayWhen the image is enlarged the enlarged area is shown. The area is flamed in green.

Scroll barUses to show the hidden list by dragging up and down.

 Excluding button.....Exclude the cell specified form analysis while remains boundary line of cell.



Selected area delete buttonYou can delete the cell within selected area and the dot of manual editing by dragging corneal endothelium image.



Manual edit button.....Specifies a cell which you need to analyze manually by tapping the center of the cell.



Undo buttonYou can undo one operation of “Exclude”, “Selected area delete”, and “manual edit”.
If manual edit check is performed, operation of before then cannot be undone.



The display of the number of manual edit cells
.....The number of the cells specified by manual edit is displayed.



Overlay button.....Classifies the image to analyze in color according to the number of cell's angle or cell area.



Zoom in button/Zoom out buttonEnlargement and reduction of image are done.



Overlay button.....Classifies the image to analyze in color according to the number of cell's angle or cell area.



Return button.....Return to Analysis result screen. (The changes are discarded.)

- 3** Tap the to display a corneal endothelium image of manual analyzing result. Even if tapping the then, the operation edited before cannot be undone.
- 4** Tap the , then the message of “Are you sure to apply change?” is displayed. If tapping “OK”, the analyzing screen where the change was applied is displayed. If tapping “Cancel”, the analyzing screen where the change was discarded is displayed.

INPUT USING USB

This instrument can input ID numbers from a bar code reader, etc. via the USB.

- 1** Check the connection of USB IN.
For connection, refer to “CONNECTING EXTERNAL I/O TERMINALS” on page 34.
- 2** Input ID numbers from the external device.
The inputted ID numbers are displayed on the screen.

OUTPUT USING LAN

This instrument can output data to a PC, etc. via the LAN interface.

- 1** Connect the network cable to LAN OUT.
For connection, refer to “CONNECTING EXTERNAL I/O TERMINALS” on page 34.
- 2** Set up of LAN connection settings.
For details, refer to “NETWORK SETTINGS” on page 76.
- 3** Perform photograph. Tap the **PRINT OUT** button of the control panel.
Output is completed.



NOTE

For explanation of messages during communication refer to the “MESSAGE LIST” on page 79.

SETTING FUNCTIONS ON SETUP SCREEN

OPERATING THE SETUP SCREEN

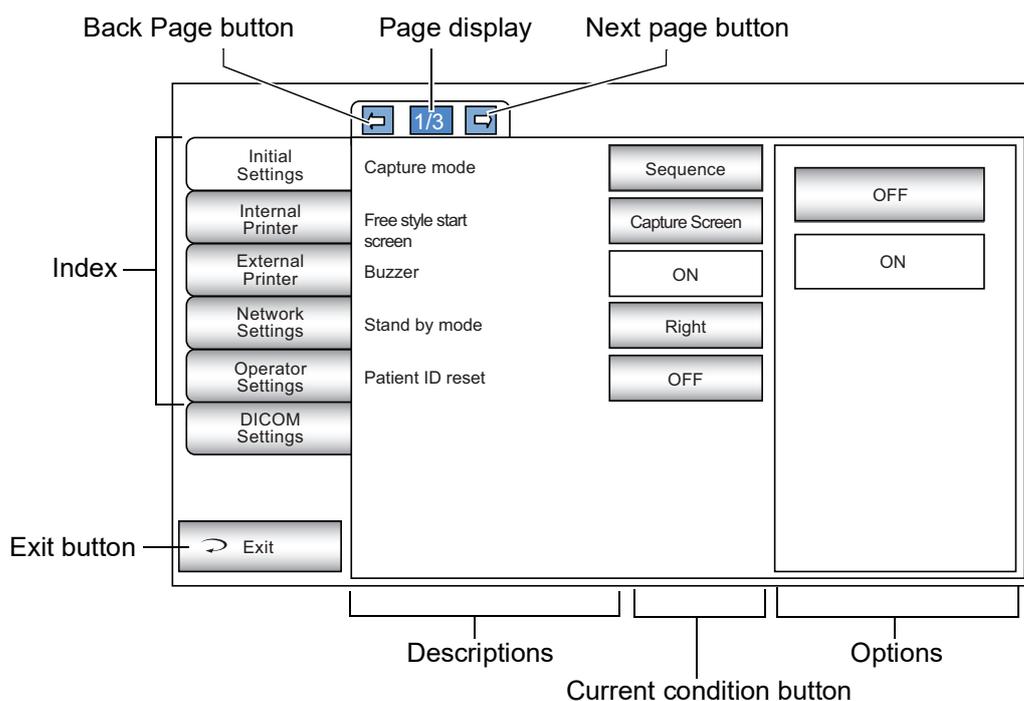
Various functions can be set on the SETUP screen.

PREPARATIONS FOR SETTING

- 1 Make sure that the power cable is connected.
For connection, refer to "CONNECTING POWER CABLE" on page 33.
- 2 Turn ON the **POWER** switch.
- 3 Tap the **SETTINGS** button on the control panel.

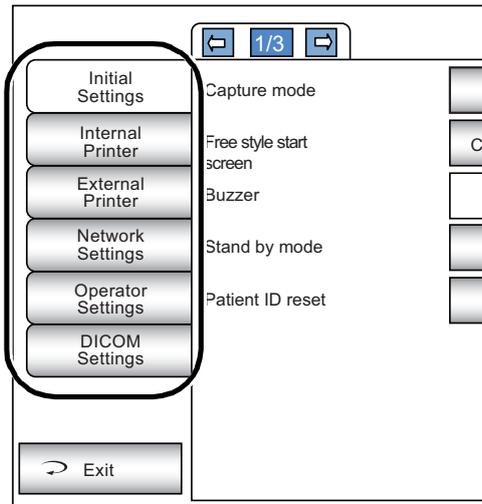


The SETUP screen is displayed.

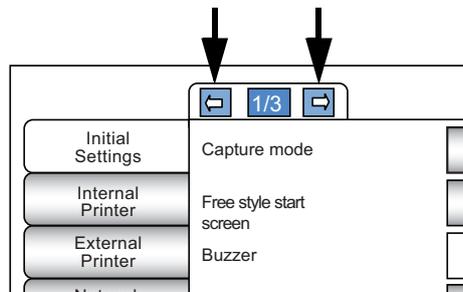


OUTLINE OF SETUP SCREEN OPERATIONS

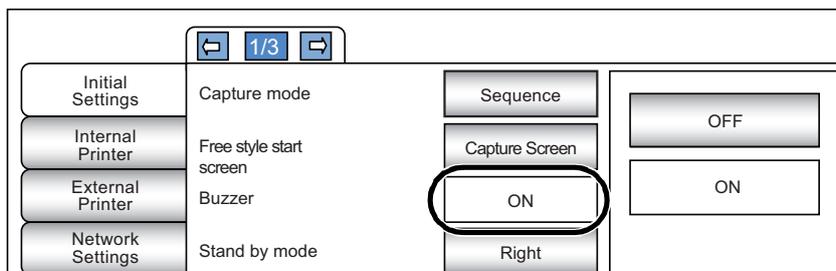
1 Tap **INDEX** and select the subject of setting.



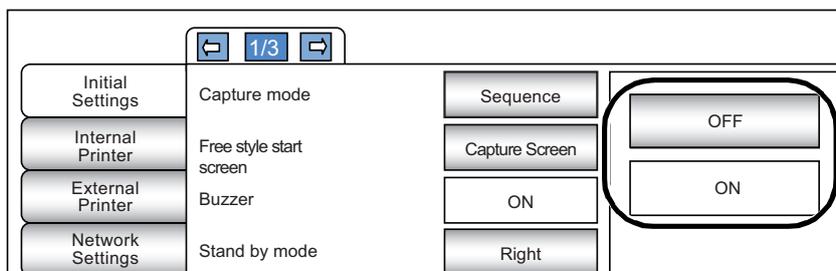
2 Operate the **NEXT PAGE** button or **BACK PAGE** button, as necessary, and display the page to confirm/change.



3 Tap the **CURRENT CONDITION** button of the item to be changed and find the **OPTIONS** button.



4 Tap the **OPTIONS** button and change the setting.

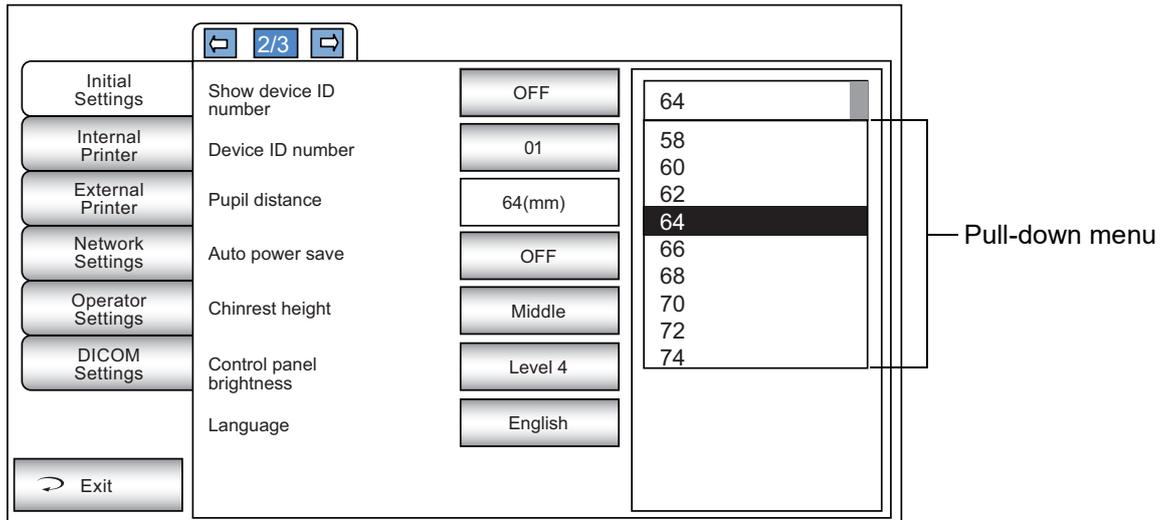


Instead of the **OPTIONS** button, pull-down menu and ten-key would be displayed.

PULL-DOWN MENU:

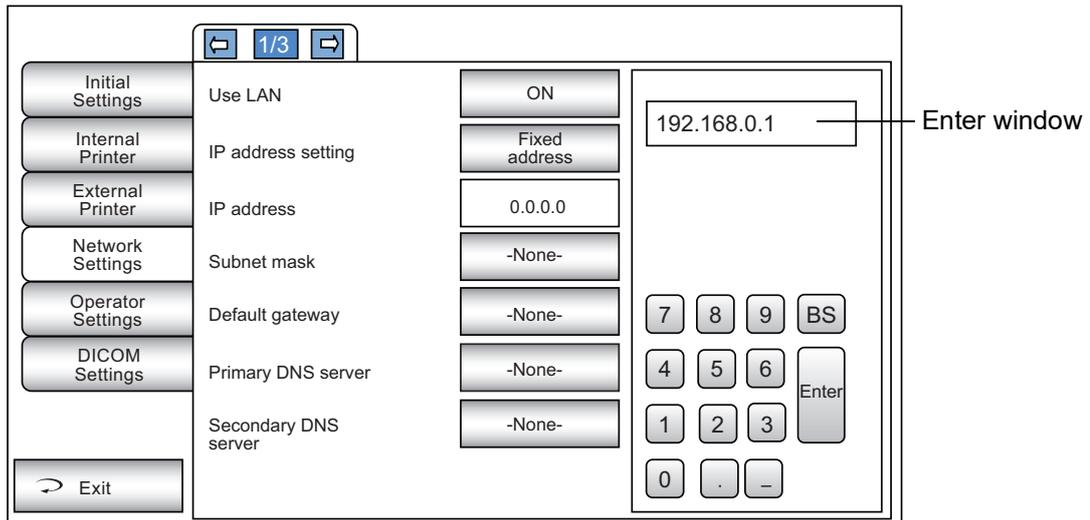
Tap the options button to show a pull-down menu.

Select a figure and value etc. to be changed in menu items.



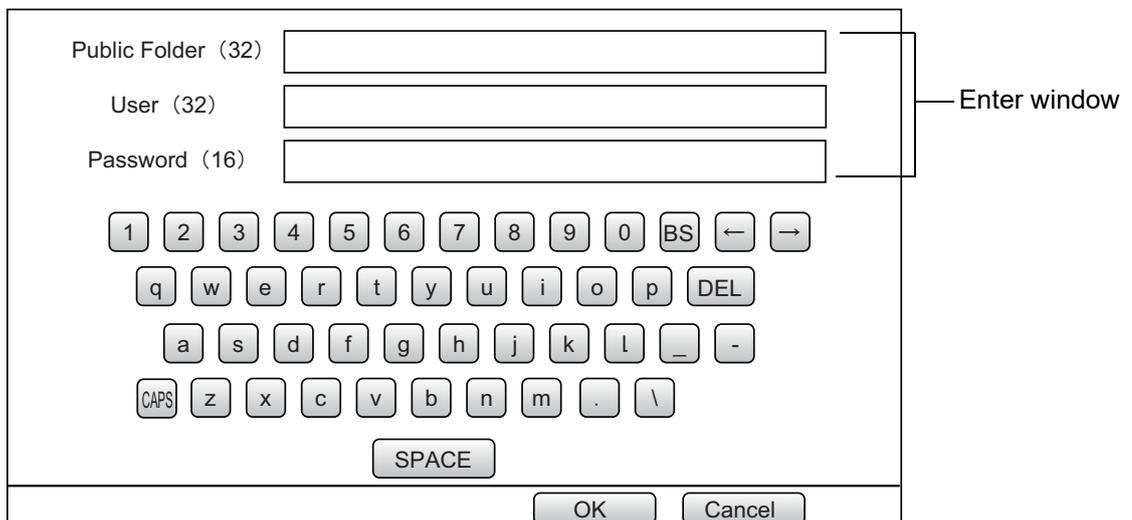
TEN-KEY:

Tap ten-key on the screen and enter the figure. If there are several windows to enter, tap the window to enter the figure by ten-key. Tap **Enter** and fix the input value.



KEYBOARD:

Tap keyboard on the screen and enter characters. If there are several windows to enter, tap the window to enter the figure by keyboard. Tap **OK** and fix the input value.



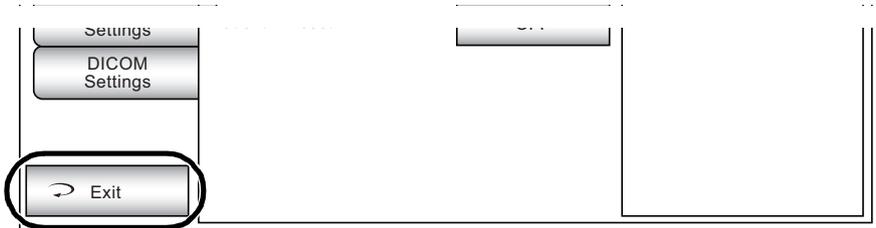


NOTE

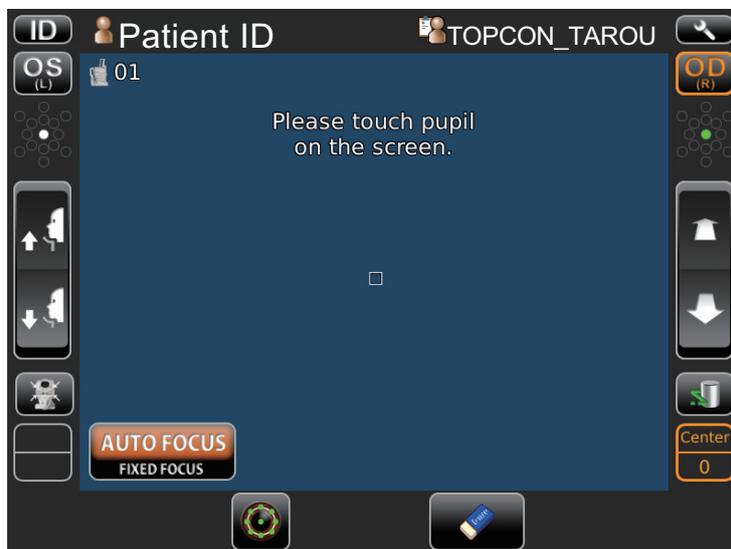
The set value is updated when an options button is tapped.

RETURNING TO THE MEASUREMENT SCREEN

- 1 Tap the **Exit** button.



- 2 The capture screen is displayed.



LIST OF SETUP ITEMS

Setup items are categorized into 6 large indexes.

“Initial Settings”.....items related to the initial status after power on

“Internal Printer”items related to output from the internal print

“External Printer”items related to output from the external print

“Network Settings”items related to output using the LAN

“Operator Settings”items related to Operator ID

INITIAL SETTINGS

Initial contains settings related to the initial status after power on, clearing all measurement values, etc.

(Region: A=America, C=China, E=Europe, J=Japan, G=General)

Descriptions	Options	Details	Initial value (Region)				
			A	C	E	J	G
Capture mode	Sequence	Operation flow is set as sequence course.	✓				
	Free style	Operation flow is set as free style course.					
Free style start screen	Capture Screen	Free style start screen is set to capture screen.	✓				
	Patient Screen	Free style start screen is set to patient screen.					
Buzzer	ON	Buzzer does not sound.	✓				
	OFF	Buzzer sounds.					
Stand by mode	Right	Waiting at the initial position for right eye measurement.	✓				
	Left	Waiting at the initial position for left eye measurement.					
	Last	Waiting at the last position of the measured eye.					
Patient ID reset	ON	Patient No. is reset upon power on.					
	OFF	Patient No. is not reset upon power on.	✓				
Show device ID number	ON	Device ID is displayed.					
	OFF	Device ID is not displayed.	✓				
Device ID number	01-99 Set by ten-key display	Sets the Device ID number.	01				
Pupil distance*1	58mm 60mm 62mm 64mm 66mm 68mm 70mm 72mm 74mm Set by pull-down menu	Sets the pupil distance between right and left eyes.	68 mm	64 mm	68 mm	64 mm	68 mm
Auto power save	OFF	Power save function is not used.					
	1min	Power save status in 1min after last operation.					
	5min	Power save status in 5min after last operation.					
	10min	Power save status in 10min after last operation.	✓				
	20min	Power save status in 20min after last operation.					
	30min	Power save status in 30min after last operation.					
	60min	Power save status in 60min after last operation.					
Chinrest height	HIGH	Default chinrest height.					
	CENTER						
	LOW		✓				
Control panel brightness (Setup of the brightness of control panel)	Level 1 (dark)	The brightness of control panel is set up.					
	Level 2						
	Level 3						
	Level 4 (bright)		✓				

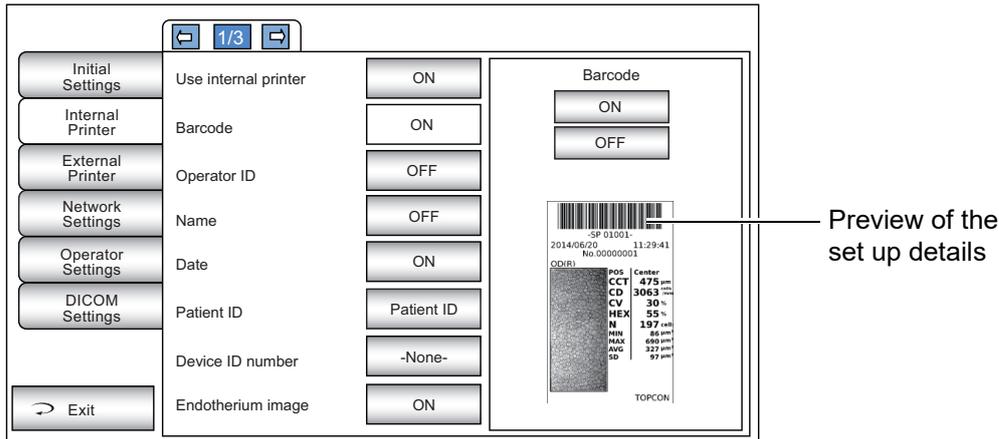
Descriptions	Options	Details	Initial value (Region)				
			A	C	E	J	G
Language	Japanese	Displayed control panel screen in Japanese.				✓	
	English	Displayed control panel screen in English.	✓	✓	✓		✓
Log level	0	Log output level is set.					
	1						
	2						
	3						
	4						
	5					✓	
	6						
Transfer log function*2	ON	Log transfer is performed to an external server.					
	OFF	Log transfer is not performed to an external server.				✓	
External server	Character string Set by keyboard display	Specifies the external server of log transfer.	None				
External Port	Set by ten-key display	Specifies the external port of external server for log transfer.	0				
Date/Time	Set by ten-key display	Sets year, month, day, time (24hrs), minute and second.	Installation date/time				
Date format	yyyy/mm/dd	Displayed in Year/Month/Day format.		✓			✓
	mm/dd/yyyy	Displayed in Month/Day/Year format.	✓				
	dd/mm/yyyy	Displayed in Day/Month/Year format.			✓		✓
Time format	24h	Displayed in 24-hour					✓
	AM/PM	Displayed in AM and PM					
Time zone	Select from the drop-down list	Time zone is set.	CET	EST5EDT	GMT+8	Japan	GMT+8
Packing mode	Execute	Starts packing mode.	-				
XZ MOTOR direction	Adjust	The moving direction is changed according to control panel position.	✓				
	Fixed	The moving direction is not changed according to control panel position.					
Patient ID request	ON	Patient ID is required.					
	OFF	Patient ID is not required.	✓				
Export SP-1P Data(USB)	ON	SP-1P data is exported to USB flash memory.					
	OFF	SP-1P data is not exported to USB flash memory.	✓				
Export USB disk usage limits	60(%) 70(%) 80(%) 90(%)	If the capacity of a USB memory is over the preset value, deletes from old data.	80				
FIXED FOCUS default position	Select from the drop-down list	Fixed focus default position is set.	550				
Auto analyze	ON	The analysis of endothelium is performed automatically after photographing.	✓				
	OFF	The analysis of endothelium is not performed automatically after photographing. (Used when rephotographing is required in a short period.)					
Factory data Reset*2	Execute	All setting is reset to the factory default settings, and power stops. Patient number is reset to 1. After the execution, please turn the power on again.	-				

*1: Depending on the destination, preset values differ.

*2: The configuration changes are reflected after restart.

INTERNAL PRINTER

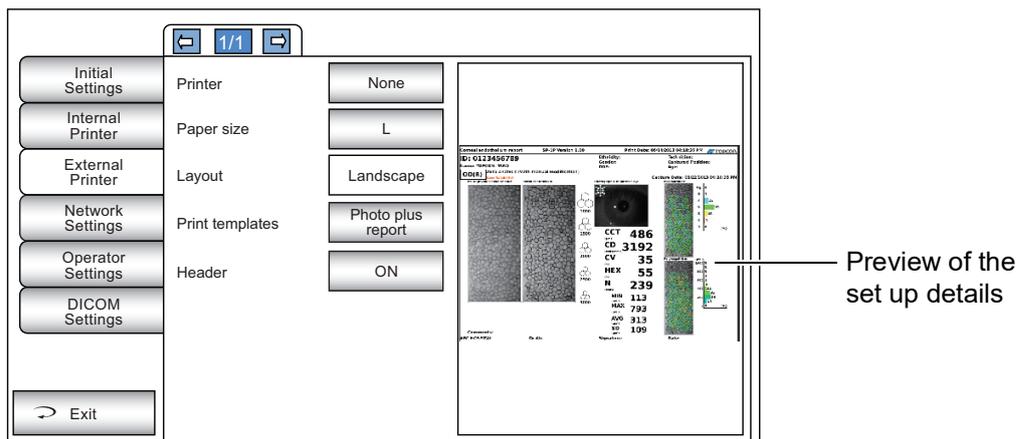
Print contains settings related to output from the internal printer.



Descriptions	Options	Details	Initial value (Region)				
			A	C	E	J	G
Use internal printer	ON	Internal printer is used.			✓		
	OFF	Internal printer is not used.					
Barcode	ON	Barcode is printed.					
	OFF	Barcode is not printed.			✓		
Operator ID	ON	Operator ID is printed.					
	OFF	Operator ID is not printed.			✓		
Name	ON	"Name" space is available.					
	OFF	"Name" space is not available.			✓		
Date	ON	Date is printed.					✓
	OFF	Date is not printed.					
Patient ID	Patient No.	Patient No. is printed.					✓
	Patient ID	Patient ID is printed. (Patient No. is printed when Patient ID is not entered. Patient No: starts from 0001, automatically added +1 upon completion of photographing).					
	OFF	Patient No. (patient ID) is not printed.					
Device ID number	ON	Device ID No. is printed.					✓
	OFF	Device ID No. is not printed.					
Endothelium image	ON	Endothelium image is printed.					✓
	Edge	Endothelium detection result is printed.					
	OFF	Endothelium image is not printed.					
Print message	ON	Message is printed.					
	OFF	Message is not printed.					✓
Message	Input	String of up to 72 characters.					None
TOPCON logo	ON	TOPCON logo is printed.					✓
	OFF	TOPCON logo is not printed.					

EXTERNAL PRINTER

Print contains settings related to output from the external printer.



Descriptions	Options	Details	Initial value (Region)				
			A	C	E	J	G
Printer	None	External printer is not used.			✓		
	CANON CP900	External printer is set to CANON CP900/910/1500.					
Paper size	L	Paper size is set as L.			✓		
	Postcard	Paper size is set as postcard.					
Layout	Landscape	Paper orientation is set as landscape (horizontal).			✓		
	Portrait	Paper orientation is set as portrait (vertical).					
Print templates	Traditional report	Traditional analysis report is output.					
	Photo plus report	Analysis report with photo image is output.			✓		
Header	ON	Header information is printed out.			✓		
	OFF	Header information is not printed out.					



NOTE

When you connect with an external printer, please connect the printer with main unit directly.

NETWORK SETTINGS

Network contains settings related to data output via LAN.

Descriptions	Options	Details	Initial value (Region)				
			A	C	E	J	G
Use LAN	ON	LAN connection is on.					
	OFF	LAN connection is off.					✓
IP address setting	Fixed address	Assign IP address manually.					✓
	DHCP	AUTO Assign IP address automatically.					
IP address	0. 0. 0. 0 Set by ten-key display.	IP address of SP-1P.					-None-
Subnet mask	0. 0. 0. 0 Set by ten-key display.	Subnet mask address of SP-1P.					-None-
Default gateway	0. 0. 0. 0 Set by ten-key display.	Default gateway address of SP-1P.					-None-
Primary DNS server	0. 0. 0. 0 Set by ten-key display.	Primary DNS Server number.					-None-
Secondary DNS server	0. 0. 0. 0 Set by ten-key display.	Secondary DNS Server number.					-None-
Export image	ON	Report image is exported.					
	OFF	Report image is not exported.					✓
Report image format	PNG	Report image is output in PNG.					✓
	JPG	Report image is output in JPG.					
Export SP-1P Data	ON	SP-1P data is output to shared folder.					
	OFF	SP-1P data is not output to shared folder.					✓
Export DCM file	ON	DCM file is output to shared folder.					
	OFF	DCM file is not output to shared folder.					✓
Shared folder setting	None (String 32char)	Path and permission to shared folder is set.					
	Folder name						
	User name						
	Password						
Show network information	-	MAC address is shown.					-
Use NTP*	ON	The time is synchronized by the NTP server.					
	OFF	The time is not synchronized by the NTP server.					✓
NTP server	Character string Set by keyboard display	Specifies NTP server address for time synchronization.					-None-

*: The configuration changes are reflected after restart.

OPERATOR SETTINGS

OPERATOR contains settings related to Operator ID.

Descriptions	Options	Details	Initial value (Region)				
			A	C	E	J	G
Use of operator ID	ON	Operator ID will be displayed on the control panel and output.					
	OFF	Operator ID will not be displayed on the control panel and output.			✓		
Prefix of Ope. ID	ASCIIZ string up to 3+1 characters including terminated null char.	Set the Prefix of Operator ID can be registered.			000		
Operator ID request	ON	Operator ID is required.			✓		
	OFF	Operator ID is not required.					
Fixed operator ID	ON	Operator ID is fixed.			✓		
	OFF	Operator ID is not fixed.					
Input fixed operator ID	ASCIIZ string up to 13 characters including terminated null char.	Input fixed operator ID.			None		

DICOM SETTINGS

DICOM contains settings related to DICOM communication.

The screenshot shows a menu with the following items:

- Initial Settings: Use DICOM (OFF), ON, OFF
- Internal Printer: Use Worklist (OFF)
- External Printer: Non Worklist data Storage (OFF)
- Network Settings: Use MPPS (OFF)
- Operator Settings: Use Storage Commitment (OFF)
- DICOM Settings: Use Patient Query (OFF), Use Storage data backup (OFF)
- Exit

Descriptions	Options	Details	Initial value (Region)				
			A	C	E	J	G
Use DICOM	ON	Output to DICOM.					
	OFF	Do not Output to DICOM.			✓		
Use Worklist	ON	Work list is used.					
	OFF	Work list is not used.			✓		
Non Worklist data Storage	ON	DCM file which is photographed by not using worklist is stored.					
	OFF	DCM file which is photographed by not using worklist is not stored.			✓		
Use MPPS	ON	MPPS is used.					
	OFF	MPPS is not used.			✓		
Use Storage Commitment	ON	Storage Commitment is used.					
	OFF	Storage Commitment is not used.			✓		
Use Patient Query	ON	Patient Query is used.					
	OFF	Patient Query is not used.			✓		

Descriptions	Options	Details	Initial value (Region)				
			A	C	E	J	G
Use Storage data backup	ON	When Storage Commitment is invalid, the DCM file of completed storage is stored.					
	OFF	When Storage Commitment is invalid, the DCM file of completed storage is not stored.			✓		
SP-1P port	0-65535 Set by ten-key display.	Port number of using to transmission between SP-1P and DICOM server.			64001		
SP-1P AE Title	Character string Set by keyboard display	AE (Application Entity) name of DICOM transmission. (32 characters)			TP_AM_SP1P_001		
Modality type	Set by pull-down menu	Selects a type of modality.			SC		
SC Modality code	Set by pull-down menu	Selects a code of SC modality.			SC		
Worklist server	Server name or IP address (32 characters) Set by keyboard display	Host name or IP address of the work list server.			-None-		
Worklist server port	0-65535 Set by ten-key display.	Access port number of the work list server.			0		
Worklist server AE title	Character string Set by keyboard display	AE name of work list server. (32 characters)			-None-		
MWMFilter-AETitle	ON	AE-title is used for MWM filter.					
	OFF	AE-title is not used for MWM filter.			✓		
MWMFilter-Modality	ON	Modality is used for MWM filter.					
	OFF	Modality is not used for MWM filter.			✓		
Query/Retrieve server	Character string Set by keyboard display	Host name or IP address of Query/Retrieve saver.			-None-		
Query/Retrieve server port	0-65535 Set by ten-key display.	Access port number of Query/Retrieve saver.			0		
Query/Retrieve server AE title	Character string Set by keyboard display	AE name of Query/Retrieve saver. (32 characters)			-None-		
MPPS server	Server name or IP address (32 characters) Set by keyboard display	Host name or IP address of MPPS server.			-None-		
MPPS server port	0-65535 Set by ten-key display	Access port number of MPPS server.			0		
MPPS server AE title	Character string Set by keyboard display	AE name of MPPS server. (32 characters)			-None-		
Storage server	Character string Set by keyboard display	Host name or IP address of the work list server.			-None-		
Storage server port	0-65535 Set by ten-key display.	Access port number of the work list server.			0		
Storage server AE title	Character string Set by keyboard display	AE name of the storage server.			-None-		
Transfer syntax	Set by pull-down menu	Selects data encoding method in DICOM.			ImplicitVR		
Institution Name	Character string Set by keyboard display	Sets the institute name.			-None-		
Station Name	Character string Set by keyboard display	Sets the station name.			-None-		
Institutional Department Name	Character string Set by keyboard display	Sets the institutional department name.			-None-		
Instance Number	Set by ten-key display.	Sets the instance number.			0		
Storage data retransmission	-	If a data failed in storage, the backup data in the USB memory is retransmitted.			-		

TROUBLESHOOTING

TROUBLE-SHOOTING OPERATIONS

MESSAGE LIST

Too far	Warns that the measuring head is too far from the patient's eye. Move the machine as close to the patient's eye.
Too close	Warns that the measuring head is too close from the patient's eye. Move the machine as far from the patient's eye.
Please touch pupil on the screen.	Displayed when the XY position is not aligned. Touch the pupil and bring the screen to the pupil center.
Please move to near the pupil.	Displayed when the manual alignment operation. The drag operation, please fit the screen to the pupil center.
Please focus, and touch pupil on the screen.	Display when the peripheral measurement. Touch the pupil and bring the screen to the pupil center.
Please set the focus position.	Tap the wave of graph to set focus position.
Close printer cover.	The printer cover is open. Close the cover until it clicks.
Paper end.	Printer paper is used up. Supply printer paper.
No Printer Response!	Failed to communicate with the printer. Once again, please start printing.
Fatal error! The temperature of printer is abnormal! Error autocutter! Error printer memory!	Displayed when the printer unit does not operate normally, such as the cutter does not work. Call the serviceman.
Packing mode was finished. Please turn off the SP-1P.	Indicates the packing operation is completed. Switch off the machine.
Cannot get the disk space information!	It was not possible to check the capacity of the USB storage. Please check USB storage is correctly inserted.
Unknown error occurred!	USB storage is not recognized correctly. Please check USB storage is correctly inserted.
There were not the applicable data.	To get the patient information from the DICOM server, but there were no patient information. Please check patient information has been entered correctly.
An error occurred by DICOM communication.	Communication with the DCOM server failed. Please check network connection, the DICOM configuration.
Turn off the unit?	Displayed to confirm whether to move the chinrest and measuring head to their last positions.
Please don't turn the main switch off until the unit stops.	Displayed to be the end of operation, please wait for the end until the operation is complete.
The unit stop completely. Please turn the main switch off.	Displayed that the end of operation is completed, please turn off the power of a instrument.
Please select an item from the list.	Displayed when you press the data call button while the list is not selected in the data call screen, please select the data to call from the list.
Do you really want to exit the viewing mode?	Displayed as a confirmation of when it returns to the normal recording mode from the viewing mode of the data call.
Exit the viewing mode, Do you want to output data?	Display for review when switching to the print item list screen to exit the browse mode, and performs printing and outputting data.
Failed to open an archive file!	Failed to call data. Please check the data you have saved USB storage, the shared folder exists.

This data has been analyzed by the older version. Do you want to reanalyze by the current version?	Display for confirmation of when you call the data of previous version.
Do you want to analyze by using the combined image?	Display for review when the analysis is performed by combining the images taken by the central panoramic.
Would you like to delete all data?	Display for confirmation before you delete the data.
Current data will be erased for the next measurement, OK?	Display for review when to clear any data taken currently to measure the following next new measurement.
Current data will be erased for the viewing mode, OK?	When the data captured is present, the display for review when calling data from the shared folder or USB by clearing the current data.
Exit the measurement, Do you want to output data?	Display for review when switching to the print item list screen to exit the measurement, and performs printing and outputting data.
Are you sure to start next measurement? Please select whether to input new patient ID or not.	Display of confirmation when the printing and output of photographic data is completed, the measurement is performed in the following waiting next.
Are you sure to execute the packing?	Display asking for confirmation of the time to the start of the packing operation.
Please don't place the face on the chinrest, to prepare for next measurement.	Displayed to confirm whether to place the face on the chinrest or not, because the measuring head shall move to the "stand by mode" position of the initial setting.
Please check the measurement eye.	Eye that is now under measurement is contralateral eye. Please move to the correct position of the subject's eye shooting head.
Is this photography finish?	Display for confirmation of when to switch to the next position by skipping current measurement.
Failed to analyze cells.	Failed to analyze the image taken. Please go shooting again by pressing the retake button.
There is no data to be output.	Data for printing and output in the print screen item list is not specified. Select the data to be output, please press the print / output button again.
USB storage is not detected. Please insert and try again.	USB storage to save measurement data could not be found. Please check USB storage is correctly inserted.
Safe to remove USB memory.	If this message appears, you can remove the USB storage safely.
Failed to configure the network! State = Fixed IP State = Default Gateway State = DNS Server State = DHCP State = Down State = Overlapping IP	An error occurred when connecting to the network. Please check the configuration settings that are displayed.
Change settings for Print/Export data.	An attempt was made to output, but the output settings are not. Please check the settings of the output.
Patient ID is required. Please set patient ID.	Displayed when the output operation is required when the setting "Required patient ID" is ON but the patient ID is not inputted. Enter the patient ID and then request the output operation.
Operator ID is required. Please set Operator ID.	Displayed when the output operation is required when the setting "Required operator ID" is ON but the operator ID is not inputted. Enter the operator ID and then request the output operation.
Fixed operator ID is required. Please set Fixed operator ID.	Displayed when the setting "Fixed operator ID" is ON but the fixed operator ID is not inputted. Enter the fixed operator ID.
The date that does not exist.	Displayed when you enter a date that does not exist when you set up the configuration of the "Date / Time", please enter the correct date.

Shared folder cannot access.	Displayed when access to the shared folder could not be in the data output, set the shared folder, are connected, please check the connected PC.
Capture mode setting has been changed. However, you need to clear data before apply the change. Would you like to delete all data?	Displayed for confirmation when the setting screen with remained data changes to capture mode.
DICOM MPPS not finish data found. Do you really want to delete this data?	Displayed for confirmation when incomplete MPPS data is found.
DICOM Worklist data found. Do you really want to delete this data?	Displayed for confirmation when worklist data is found.
DICOM MPPS data post normal end.	Displayed when MPPS data transmission is completed.
There are DICOM data that are not stored on the server. Do you want to save? There is it can take a long time to complete.	Displayed for confirmation before the storage data is retransmitted.
Can not to use the "*" and "?".	The "*" and "?" can not use for Patient ID.
Search key string is required. Please set ID or name.	Enter patient ID or name before tapping the Query button for query patient.
Low reliability data. Please check the analysis results.	It considered that low reliability of analyzed value occurs because the number of cell which has been analyzed is a few. Please check whether there is any problem in the analysis result.
Are you sure to apply changes?	Displayed for confirmation before applying the result of manual edit.
Are you sure to discard changes?	Displayed for confirmation before discarding the result of manual edit.
Analyze error occurred. Please turn the main switch off.	Turn off the power because it is the error that cannot continue processing.
Communication error occurred. Please turn the main switch off.	Turn off the power because it is the error that cannot continue processing.
Internal error occurred. Please turn the main switch off.	Turn off the power because it is the error that cannot continue processing.
Failed to extract an image!	The processing was unable to be completed as an internal error occurred.
Failed to create a panorama.	The processing was unable to be completed as an internal error occurred.
Failed to parse a panorama data.	The processing was unable to be completed as an internal error occurred.
Invalid password!	This is available for service engineer only.
Please check the DATE/TIME	The battery for the built-in clock become run down. <ul style="list-style-type: none"> • Before using, confirm the time and date on the SETUP menu. • If the message comes up frequently, call your service engineer.
X motor initialize error. Y motor initialize error. Z motor initialize error. Chinrest error.	Failed to initialize driving unit of main body. If the message is displayed, call your service engineer.
Cannot allocate memory!	Displayed when available memories on system are lack. The processing which you have to perform may not have been performed correctly.
There was a mismatch in the time zone setting. It has been set to UTC.	Displayed when the time zone setting is not performed or not correct. In this case the time zone is set to UTC forcibly. Please perform time synchronization again to change the time zone at the initial settings of setup screen.

Focus data is not available.	Not be able to display the corneal back located in the graph is for the reflected light from the corneal back is small. Please refer to the measuring again conveyed to the subject so as not to move during the measuring.
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TROUBLE-SHOOTING OPERATIONS

 WARNING	To avoid electrical shock, do not open the instrument. All service should be performed by a qualified service engineer.
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If a problem is suspected, use the following check list.

If following instructions does not improve the condition, or if your problem is not included in the list, contact your dealer or TOPCON at the address on the back cover.

CHECK LIST

Trouble	Condition	Check	Page
Control panel does not turn on.	—————	Is power cable unplugged?	33
		Is power cable connected to the instrument?	33
Control panel is not clear.	The image is dark.	Adjust the brightness by “Control panel Brightness Adjust”.	72
Any trouble is found in a movable part.	—————	Do not move it forcibly but call our service engineer.	Inside back cover
Printing is not done.	Paper comes out without printing.	Confirm the direction of paper winding. If the direction is incorrect, reset paper to the proper direction.	36
	Paper does not come out.	If “PAPER END” displayed on control panel, replenish printer paper.	36

SPECIFICATIONS AND PERFORMANCE

Item	Specifications
Corneal endothelium photography	
Photography magnification	254x (on the control panel: within $\pm 8\%$)
Photography range	0.25x0.55mm (within $\pm 8\%$)
Resolving power	More than 125 line/mm
Fixation target	Central and peripheral
Corneal thickness measurement	
Measurement range	0.400-0.750mm Display unit: 0.001mm step display Allowance: Less than 0.600mm within ± 0.010 mm Over 0.600mm within ± 0.025 mm • Corneal thickness is measured only when taking a photograph using the central fixation target.

GENERAL INFORMATION ON USAGE AND MAINTENANCE

INTENDED PATIENT POPULATION

The patient who undergoes an examination by this instrument must maintain concentration for a few minutes and keep to the following instructions:

- To fix the face to the chinrest, forehead rest.
- To keep the eye open.
- To understand and follow instructions when undergoing an examination.

INTENDED USER PROFILE

Since the SPECULAR MICROSCOPE SP-1P is a medical device, the operation should be supervised by a physician.

ENVIRONMENTAL CONDITIONS OF USE

Temperature	: 10°C to 40°C
Humidity	: 30% to 90% RH(without condensation)
Pressure	: 800hPa to 1060hPa

STORAGE, USAGE PERIOD

1. Environmental conditions (without package)

*Temperature : 10°C to 40°C

Humidity : 10% to 95% (without condensation)

Pressure : 700hPa to 1060hPa

* THIS INSTRUMENT DOES NOT MEET THE TEMPERATURE REQUIREMENTS OF ISO 15004-1 FOR STORAGE. DO NOT STORE THIS INSTRUMENT IN CONDITIONS WHERE THE TEMPERATURE MAY RISE ABOVE 40°C OR FALL BELOW 10°C.

2. When storing the instrument, ensure that the following conditions are met:

- (1) The instrument must not be splashed with water.
- (2) Store the instrument away from environments where pressure, temperature, humidity, ventilation, sunlight, dust, salty/sulfurous air, etc. could cause damage.
- (3) Do not store or transport the instrument on a slanted or uneven surface or in an area where it is subject to vibrations or instability.
- (4) Do not store the instrument where chemicals are stored or gas is generated.

3. Normal life span of the instrument:

8 years from delivery providing regular maintenance is performed [TOPCON data]

ENVIRONMENTAL CONDITIONS FOR PACKAGING IN STORAGE

(Product in its normal transport and storage container as provided by manufacturer)

Temperature	: -20°C to 50°C
Humidity	: 10% to 95%
Pressure	: 700hPa to 1060hPa

ENVIRONMENTAL CONDITIONS FOR PACKAGING IN TRANSPORTATION

(Product in its normal transport and storage container as provided by manufacturer)

Temperature	: -40°C to 70°C
Humidity	: 10% to 95%
Pressure	: 700hPa to 1060hPa

ELECTRIC RATING

Source voltage	: 100-240V AC
Frequency	: 50-60Hz
Power input	: 70-120VA

SAFETY DESIGNATIONS PER IEC 60601-1 STANDARD

- Type of protection against electric shocks: Class I
The Class I equipment provides means to connect itself to the protective grounding system of utilities to thereby independently provide protection against electric shocks by keeping connectable metal components nonconductive in case of a failure in the basic insulation.
- Degree of protection against electric shocks: B type applied component
The B type applied component provides the specified degree of protection against electric shocks with regard to the reliability particularly of leak current, patient measuring current and protective utility connection (in case of Class I equipment).
- Degree of protection against harmful intrusion of water (IEC 60529): IPX0
This product does not provide protection against intrusion of water.
(The degree of protection against harmful ingress of water defined in IEC 60529 is IPX0)
- Classification by sterilization/disinfection method specified by manufacturer
This product does not have a component requiring sterilization/disinfection.
- Classification by safety of use in air/flammable anesthetic gas, oxygen or nitrous oxide/flammable anesthetic gas atmosphere
 - Equipment not suited for use in air/flammable anesthetic gas, oxygen or nitrous oxide/flammable anesthetic gas atmosphere
 - This product should be used in an environment free of flammable anesthetic gas and other flammable gases.
- Classification by operation mode
Continuous operation refers to an operation under normal load conditions, within the specified temperature and without limitations on the operating time.

DIMENSIONS AND WEIGHT

Dimensions	: 286~468mm(W) × 445~592mm(D) × 486~681mm(H)
Weight	: 17.0kg

OPERATION PRINCIPLE

Photography of the corneal endothelium:

Slit light is projected from oblique direction to a patient's eye, and corneal endothelial cells are photographed with the CCD camera optically installed in a diagonal. Image processing of the photographed corneal endothelial cells is carried out, the boundary of a cell is detected, and the area (Cell density (CD), Minimum cell area (MIN), Maximum cell area (MAX), Average cell area (AVG), Standard deviation of cell area (SD), Coefficient of variation (CV) and cell area histogram) and the form (Frequency of hexagon cells (HEX) and form histogram (angle of cell)) are computed.

The boundary line of cell can be corrected (adding, deleting and modifying e.g.) by manual operation.

Cornea thickness measurement:

The slit light is projected onto the patient eye at a slant.

The corneal thickness is measured by processing reflected light from the corneal surface and back, which is received by line sensor that is optically installed in a diagonal.

CHECKPOINTS FOR MAINTENANCE

1. Regularly maintain and check the equipment and parts.
2. When resuming the use after a long period of storage, verify that the instrument operates correctly and safely.
3. To ensure the correct reading, do not mar the photographing window with finger prints, dust, etc.
4. If the photographing window is soiled, clean it following the “CLEANING THE PHOTOGRAPHING WINDOW GLASS” instructions on page 98.

DISPOSAL

When disposing of the instrument and/or parts, follow local regulations for disposal and recycling.

 NOTE	 <p>This symbol is applicable for EU member countries only. To avoid potential damage to the environment and possibly human health, this instrument should be disposed of (i) for EU member countries - in accordance with WEEE (Directive on Waste Electrical and Electronic Equipment), or (ii) for all other countries, in accordance with local disposal and recycling laws.</p>
	<p>This Product Contains a coin cell. You cannot replace batteries by yourself. When you need to replace and/or dispose batteries, contact your dealer or TOPCON listed on the back cover.</p>
	 <p>EU Battery Directive This symbol is applicable for EU members states only. Battery users must not dispose of batteries as unsorted general waste, but treat properly. If a chemical symbol is printed beneath the symbol shown above, this chemical symbol means that the battery or accumulator contains a heavy metal at a certain concentration. This will be indicated as follows: Hg: mercury(0.0005%), Cd: cadmium(0.002%), Pb: lead(0.004%) These ingredients may be seriously hazardous to human and the global environment.</p>

ELECTROMAGNETIC COMPATIBILITY

This product conforms to the EMC standard IEC 60601-1-2:2014+AMD1:2020 (Ed.4.1).

The expected electromagnetic environment for the whole life cycle is home medical treatment environment.

- a) MEDICAL ELECTRICAL EQUIPMENT needs special precautions regarding EMC and needs to be installed and put into service according to the EMC information provided in the ACCOMPANYING DOCUMENTS.
- b) Portable and mobile RF communications equipment can affect MEDICAL ELECTRICAL EQUIPMENT.
- c) The use of ACCESSORIES, transducers and cables other than those specified, with the exception of transducers and cables sold by the manufacturer of the EQUIPMENT or SYSTEM as replacement parts for internal components, may result in increased EMISSIONS or decreased IMMUNITY of the EQUIPMENT or SYSTEM.
- d) The EQUIPMENT or SYSTEM should not be used adjacent to or stacked with other equipment. If adjacent or stacked use is necessary, the EQUIPMENT or SYSTEM should be observed to verify normal operation in the configuration in which it will be used.
- e) The use of the ACCESSORY, transducer or cable with EQUIPMENT and SYSTEMS other than those specified may result in increased EMISSION or decreased IMMUNITY of this EQUIPMENT and result in improper operation.
- f) Do not use the devices generating electromagnetic waves within 30cm from all the parts of the instrument and system. Those devices may have influence on this product.

Item	Cable Shielded	Ferrite Core	Length (m)
AC power cord for (AC100V)	NO	NO	1.4
AC power cord for (AC120V)	NO	NO	1.4
AC power cord for (AC230V)	NO	NO	2.9
AC power cord for (Isolation transformer)	NO	NO	1.4
FG cable	NO	NO	2.3
LAN cable	NO	YES	2.0
USB mouse cable	YES	NO	1.8
DC cable for PC AC adapter	NO	NO	1.8
AC power cord for PC AC adapter	NO	NO	1.8
USB cable	YES	NO	3.0
DC cable for Printer AC adapter	NO	NO	1.5
AC power cord for Printer AC adapter	NO	NO	0.9

Guidance and manufacturer's declaration - electromagnetic emissions		
The SP-1P is intended for use in the electromagnetic environment specified below. The customer or the user of the SP-1P should assure that it is used in such an environment.		
Emissions test	Compliance	Electromagnetic environment - guidance
RF emissions CISPR 11	Group 1	The SP-1P uses RF energy only for its internal function. Therefore, its RF emissions are very low and are not likely to cause any interference in nearby electronic equipment. The SP-1P is suitable for use in all establishments including domestic and those directly connected to the public low-voltage power supply network that supplies buildings used for domestic purposes.
RF emissions CISPR 11	Class B	
Harmonic emissions IEC 61000-3-2	Class A	
Voltage fluctuations/ flicker emissions IEC 61000-3-3	Complies	

Guidance and manufacturer's declaration - electromagnetic immunity

The SP-1P is intended for use in the electromagnetic environment specified below.
The customer or the user of the SP-1P should assure that it is used in such an environment.

Immunity test	Test level	Compliance level	Electromagnetic environment - guidance
Electrostatic discharge (ESD) IEC 61000-4-2	± 8 kV contact ± 15 kV air	± 8 kV contact ± 15 kV air	Floors should be wood, concrete or ceramic tile. If floors are covered with synthetic material, the relative humidity should be at least 30%.
Electrical fast transient/burst IEC 61000-4-4	± 2 kV for power supply lines ± 1 kV for input/output lines Repetition frequency 100kHz	± 2 kV for power supply lines ± 1 kV for input/output lines Repetition frequency 100kHz	Main power quality should be that of a typical commercial or hospital environment.
Surge IEC 61000-4-5	± 1 kV line(s) to line(s) ± 2 kV line(s) to earth	± 1 kV line(s) to line(s) ± 2 kV line(s) to earth	Main power quality should be that of a typical commercial or hospital environment.
Voltage dips, short interruptions and Voltage variations on power supply input lines IEC 61000-4-11	0% U_T for 0.5 cycle (with phase angle 0°, 45°, 90°, 135°, 180°, 225°, 270° and 315°) 0% U_T for 1 cycle 0° 70% U_T for 25/30 cycles 0° 0% U_T for 250/300 cycles	0% U_T for 0.5 cycle (with phase angle 0°, 45°, 90°, 135°, 180°, 225°, 270° and 315°) 0% U_T for 1 cycle 0° 70% U_T for 25/30 cycles 0° 0% U_T for 250/300 cycles	Main power quality should be that of a typical commercial or hospital environment. If the user or the SP-1P requires continued operation during main power interruptions, it is recommended that the SP-1P be powered from an uninterruptible power supply or battery.
Power frequency (50/60 Hz) magnetic field IEC 61000-4-8	30 A/m	30 A/m	Power frequency magnetic fields should be at levels characteristic of a typical location in a typical commercial or hospital environment.
NOTE U_T is the a.c. main voltage prior to application of the test level.			

Guidance and manufacturer's declaration - electromagnetic immunity

The SP-1P is intended for use in the electromagnetic environment specified below.
The customer or the user of the SP-1P should assure that it is used in such an environment.

Immunity test	Test level	Compliance level	Electromagnetic environment - guidance
Conducted RF IEC 61000-4-6 Radiated RF IEC 61000-4-3	3 Vrms 150kHz to 80MHz 6Vrms Within ISM band and amateur radio band of 150kHz to 80MHz 10V/m 80MHz to 2.7GHz Proximity electromagnetic field from radio communication equipment ^{a)}	3 Vrms 150kHz to 80MHz 6Vrms Within ISM band and amateur radio band of 150kHz to 80MHz 10V/m 80MHz to 2.7GHz Proximity electromagnetic field from radio communication equipment ^{a)}	Portable and mobile RF communications equip- ment should be used no closer to any part of the SP-1P, including cables, than the recommended separation distance calculated from the equation applicable to the frequency of the transmitter. Recommended separation distance $d = \frac{6}{E} \sqrt{P}$ where P is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer, d is the recommended separation distance in meters (m), and E is the radiation electromagnetic field level in volt/meter (V/m).
Proximity mag- netic fields IEC 61000-4-39	30kHz CW 8A/m 134.2kHz PM2.1kHz 50% 65A/m 13.56MHz PM50kHz 50% 7.5A/m	30kHz CW 8A/m 134.2kHz PM2.1kHz 50% 65A/m 13.56MHz PM50kHz 50% 7.5A/m	The exterior surface of the SP-1P should be kept at least 0.15m from RF emitters such as RFID readers.

NOTE 1 These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.

a) The table below shows the proximity electromagnetic field from radio communication equipment.

Test frequency [MHz]	Band [MHz]	Equipment	Modulation	Maximum output (W)	Distance (m)	Immunity test value [V/m]
385	380-390	TETRA 400	Pulse modulation 18Hz	1.8	0.3	27
450	430-470	GMRS 460 FRS 460	FM ±5kHz 1kHz sine	2	0.3	28
710	704-787	LTE Band 13, 17	Pulse modulation 217Hz	0.2	0.3	9
745						
780						
810	800-960	GSM 800/900 TETRA 800 iDEN820 CDMA850 LTE Band 5	Pulse modulation 18Hz	2	0.3	28
870						
930						
1720	1700-1990	GSM 1800 CDMA1900 GSM 1900 DECT LTE Band 1,3,4,25 UMTS	Pulse modulation 217Hz	2	0.3	28
1845						
1970						
2450	2400-2570	Bluetooth WLAN 802.11 b/g/n RFID 2450 LTE Band7	Pulse modulation 217Hz	2	0.3	28
5240	5100-5800	WLAN 802.11 a/n	Pulse modulation 217Hz	0.2	0.3	9
5500						
5785						

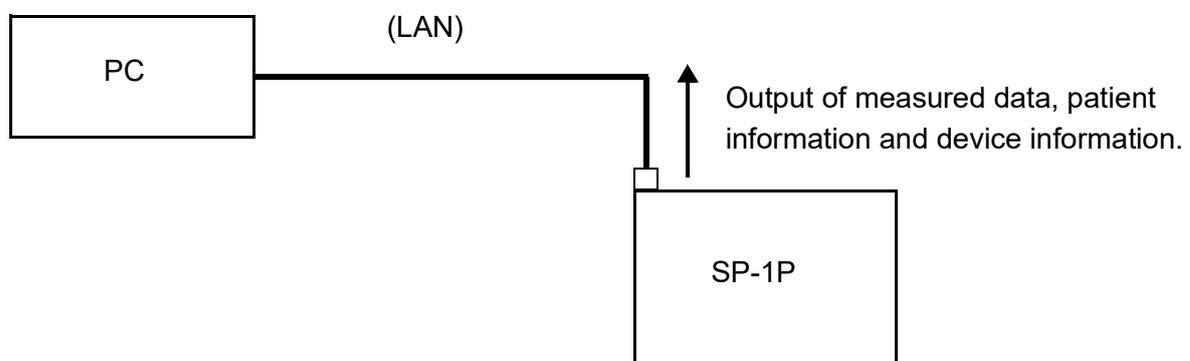
REQUIREMENTS FOR THE EXTERNAL DEVICE

The external device connected to the analog and digital interfaces must comply with the respective IEC or ISO standards (e.g. IEC 62368-1 for data processing equipment and IEC 60601-1 for medical equipment).

Anybody connecting additional equipment to medical electrical equipment configures a medical system and is therefore responsible that the system complies with the requirements for medical electrical systems. Attention is drawn to the fact that local laws take priority over the above mentioned requirements. If in doubt, contact your dealer or TOPCON (see the back cover).

IT NETWORK ENVIRONMENT

- SP-1P can be connected with personal computer (PC), output the measurement data by operating the main unit. And patient information and device information can be output with using PC.
- Refer to the figure below for the characteristics, configuration, technical specification, intended information flow and route when connected with an IT network.
- When connected with an IT network, ensure the appropriate and sufficient security to prevent the infection with a computer virus, the leak of information, etc.
- When any failure occurs in IT systems, some troubles may be caused by it. For example, the input data/output data cannot be sent/received to/from the devices connected with network, or the operator cannot operate the main unit.
- When connected with an IT network with which a device other than SP-1P is connected, the patient, the operator or the third party may suffer unexpected and unacceptable risks. Before using SP-1P, it is recommended to identify, analyze, evaluate and manage these risks.
- When the IT network has been changed after the connection, a new risk may occur. So an additional analysis is necessary.
- The change of IT network includes the following items:
 - Change in the IT network configuration;
 - Connection of additional items to IT network;
 - Removal of items from IT network;
 - Update of the device connected with IT network;
 - Upgrade of the device connected with IT network.

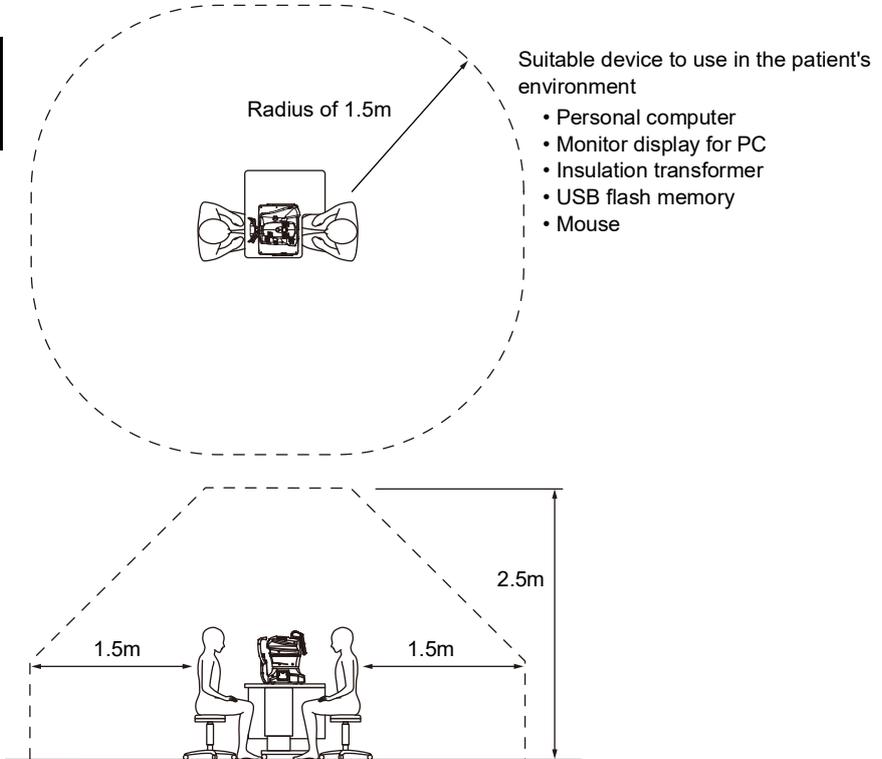


PATIENT'S ENVIRONMENT

When the patient or inspector comes into contact with the devices (including the connecting devices) or when the patient or inspector is in contact with the person that touches the devices (including the connecting devices), the patient's environment is shown below.

In the patient's environment, use devices conforming to IEC 60601-1. If you are compelled to use any device not conforming to IEC 60601-1, use an insulation transformer.

Do not use multiple outlet strip in the patient's environment.
Be sure to connect the power supply to commercial power.



- Suitable device to use in the patient's environment
- Personal computer
 - Monitor display for PC
 - Insulation transformer
 - USB flash memory
 - Mouse

Note 1: Use the personal computer conforming to IEC 62368-1.

Note 2: Don't remove the cover from the personal computer.

Note 3: Use the insulation transformer conforming to IEC 60601-1.

<b style="font-size: 1.2em; margin-left: 10px;">WARNING	<p>Connect only items that have been specified as part of the ME system or that have been specified as being compatible with the ME system.</p>
<b style="font-size: 1.2em; margin-left: 10px;">CAUTION	<ul style="list-style-type: none"> • Don't connect an additional power strip or an extension cord to the system. • The total 1kVA is the maximum allowable load of the auxiliary power supply socket for the insulation transformer, which is provided for the system. Don't connect the device exceeding this capacity. • Use the auxiliary power supply socket of the insulation transformer to power only a device that will be a component of the system. • It is dangerous to connect any device which is not used as a component of the system, to the insulation transformer. • When the insulation transformer is not used, the personal computer and the monitor for the personal computer must be installed out of the patient's environment.

REFERENCE

TYPE OF PLUG

Country	Voltage/frequency	Type of plug
Mexico	110V/50Hz	Type C/E
Argentina	220V/60Hz	Type A
Peru	220V/60Hz	Type A
Venezuela	110V/50Hz	Type C/E
Bolivia & Paraguay	220V/60Hz	Type A (Most common) Type H (Infrequently)
Chile	220V/60Hz	Type A
Colombia	110V/50Hz	Type C
Brazil	220V/60Hz 127V/60Hz	Type A Type C
Ecuador	110V/50Hz	Type C/E
United States	120V/60Hz	Type A (Hospital Grade)
Canada	120V/60Hz	Type A (Hospital Grade)

ABOUT THE BARCODE OF THE MANUAL BACK COVER

The barcode of the manual back cover indicates the parts management code of the manual.



MAINTENANCE

MAINTAINING ACCURACY

PHOTOGRAPHING WINDOW

When the lens of the photographing window is dirty, the control panel may be hard to view or a clear image may not be obtained. Make sure that the photographing window is not dirty before using the instrument. If the photographing window is dirty, clean it.

(See page 98 “CLEANING THE PHOTOGRAPHING WINDOW GLASS”.)

BRIGHTNESS ADJUSTMENT OF CONTROL PANEL

- The control panel is optimally adjusted when shipped.
- For control panel brightness adjustment, see “INITIAL SETTINGS,” “Control panel brightness” (page 72).

DAILY CHECKUPS

DAILY MAINTENANCE

- For this instrument, dust may cause errors. When not in use, replace the measuring lens cap and dust cover.
- When not in use, turn off the POWER switch.



NOTE

When using the dust cover, tap the Reset button and return the chinrest and measuring head to their initial positions.

ORDERING CONSUMABLE ITEMS

- When ordering consumable items, tell the product name, product code and quantity to your dealer or TOPCON at the address of back cover.

Product name	Product code
Chinrest tissue	403104082
Silicon cloth	448001001
Dust cover	423609002

Product name	Product code
Printer paper	448004001



USER MAINTENANCE ITEM

Item	Inspection time	Contents
Inspection	Before using	<ul style="list-style-type: none">• The instrument works properly.• The photographing window must be free of stain or flaw.
Cleaning	When the part is stained	<ul style="list-style-type: none">• Photographing window• External cover, control panel, etc.
Replacement	As required	<ul style="list-style-type: none">• Printer form

MANUFACTURER MAINTENANCE ITEMS

Item	Checking time	Contents
Cleaning each component	Within 12 months	<ul style="list-style-type: none">• Cleaning outer covers• Checking the optical system• Cleaning POWER unit
Operation check	Within 12 months	<ul style="list-style-type: none">• Checking the main body operation• Checking switches
Accuracy check	Within 12 months	<ul style="list-style-type: none">• Confirming the corneal endothelium analyzing functions (using special tools)• Confirming the cornea thickness measurement functions (using special tools)

PRINTER PAPER JAM



CAUTION

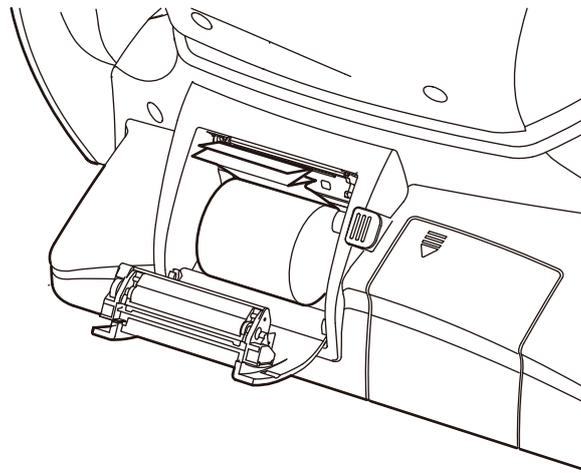
- To avoid failure or potential injury, do not open the printer cover while the printer is in operation.
- To avoid potential injury in case of malfunction, including a paper jam, be sure to shut off the power before attempting to repair it.
- To avoid potential injury, do not touch the printer body including metal parts or the paper cutter, while the printer is in operation or when replacing the printer paper.



NOTE

If the printer paper is jammed in the printer, printing will stop and the jam should be cleared.

- 1** Open the printer cover, and take out the jammed paper pieces.

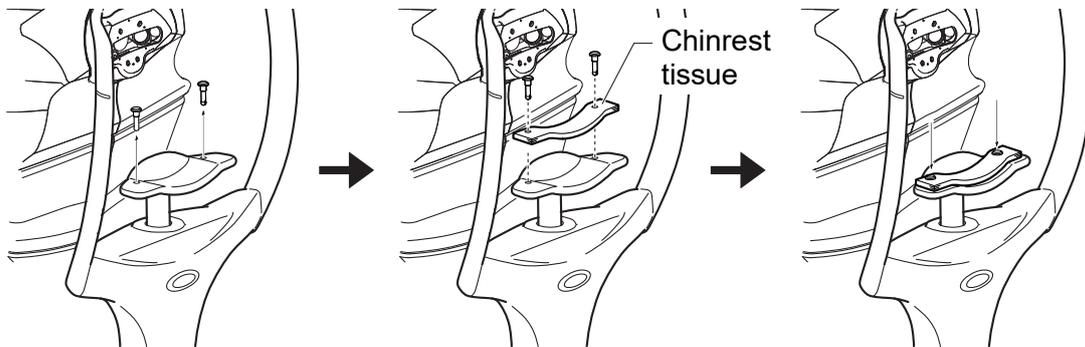
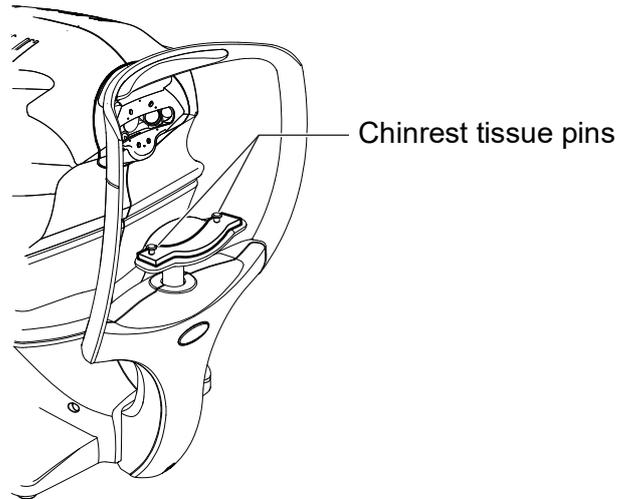


NOTE

After removing the jammed printer paper, tap the Print button to print out the previous measurement data.
If no previous measurement data has saved, a blank sheet is printed out.

SUPPLYING THE CHINREST TISSUE

- When the chinrest tissue has run out, pull off chinrest tissue pins and place new tissue.



MAINTENANCE

 CAUTION	To avoid electric shocks, make sure the power is off and the power cable is unplugged before maintenance.
 NOTE	<ul style="list-style-type: none">• To avoid damage to the instrument or electric shock, turn the power switch OFF and unplug the power cord before maintenance.• Avoid spraying a cleaner directly onto the instrument. In such a case, detergent or any other fluid may permeate through the vent hole, etc. which can cause mechanical problems with the instrument.• When not in use, turn off the power switch.• Do not clean plastic parts with solvents. Benzine, thinner, ether and gasoline may cause discoloring and decomposition.

CLEANING THE INSTRUMENT

- Dust on photographing window glass.....Blow off dust with a blower.
- Fingerprints and oil spots on photographing window glass
Blow off dust with a blower and wipe the surface gently with a camera lens cleaner using clean gauze.
- Dirty instrument cover..... Wipe the surface with the attached silicon cloth or a dry soft cloth. Never use solvents or a chemical duster.

CLEANING THE PHOTOGRAPHING WINDOW GLASS

- To secure auto alignment and correct photographing values, clean the photographing window glass after each day's work.
- Clean the glass when "CLEAN THE PHOTOGRAPHING WINDOW GLASS" is displayed on the control panel screen.

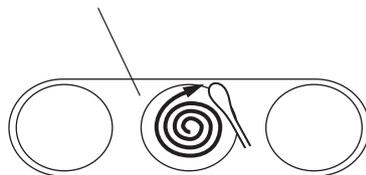
1 Prepare a lens cleaner.

2 Using a blower, blow off any dust from the surface of the lens or glass.

3 Moisten an applicator with the lens cleaner.

4 Lightly wipe the lens from its center point toward the outside in a swirl, using the applicator.

How to move the applicator



How to wipe the lens or glass

5 If all the stains cannot be removed, repeat this procedure a few times.

 NOTE	<ul style="list-style-type: none">• Don't wipe the photographing window using a commercial tissue, etc. This may make the photographing window dirtier.• Don't wipe the photographing window using gauze held with tweezers. This may damage the surface of the lens or glass.• Replace new applicator and repeat cleaning.
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6 It is complete when stains can be wiped off finely. If the stains are still hard to remove, contact your dealer or the TOPCON sales department.

CLEANING THE COVER

 NOTE	Do not clean plastic parts with solvents. Benzine, thinner, ether and gasoline may cause discoloring and decomposition.
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1 If the cover get soiled, wipe the surface with dry cloth.

2 If the cover is noticeably stained, wipe the surface with a damp cloth which is moistened in a tepid water solution of neutral detergent.

CLEANING THE CONTROL PANEL

 NOTE	<ul style="list-style-type: none">• As the control panel screen is a touch panel, be sure to turn off the POWER switch before wiping. The touch panel will react and malfunction.• When the monitor cleaner has become dirty, wash it. When washing, rinse it thoroughly so no detergent is left. If the detergent is left, it may cause uneven wiping.
---	--

CONTAMINATION BY DUST

Remove the dust with a soft brush, and wipe with the attached monitor cleaner.

CONTAMINATION BY FINGERPRINTS

Wipe with the attached monitor cleaner.

If the stain still remains, moisten the monitor cleaner with water and then wipe off the stain.

CLEANING THE FOREHEAD REST AND CHIN REST

- Wipe the forehead rest and the chin rest with a cloth moistened with a tepid solution of neutral detergent for kitchenware.

CLEANING OF EXTERNAL INPUT / OUTPUT DEVICE

- Clean according to each instruction manual.

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- (f) remove, erase or make unclear any copyright notice of the SOFTWARE; or
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- 6.2 Upon any termination of these LICENSE TERMS, USER shall immediately cease to use the INSTRUMENT in any manner. Any memory paid by USER shall not be refunded after use or installation by USER of the INSTRUMENT for any reason whatsoever including any termination of these LICENSE TERMS.
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TOPCON shall not be liable for any and all obligations under this Section 7.1 if

- (1) the hidden defect is not notified within said ninety (90)-day period, or
- (2) any defect has arisen out of, resulted from or in connection with any abuse, misuse, accident, neglect or unauthorized use or repair, or any other improper use, etc. which is not attributable to TOPCON.

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USER MANUAL

Revision 12

Date of issue 2023-11-1

Published by TOPCON CORPORATION

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SPECULAR MICROSCOPE

SP-1P

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1062801-01-B

Printed in Japan 2311-100LW ⑫