

## **USER MANUAL**

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# **SPECULAR MICROSCOPE SP-1P**



# INTRODUCTION

Thank you for purchasing the TOPCON Specular Microscope SP-1P.

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## **INTENDED USE / INDICATIONS FOR USE**

The Topcon 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.

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## **FEATURES**

**This instrument features the following:**

- The position of the touch panel can be adjusted to accommodate the operator's preferred position.
- Photography of the corneal endothelium and the measurement of the corneal thickness can be performed.
- The auto-alignment function ensures quick and easy measurement and photography.
- The cell analysis enables the user to easily get the value of the cell density.

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## **PURPOSE OF THIS MANUAL**

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

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

Keep this Manual at hand for future reference.

- 
- Since this product is a precision instrument, always use and keep it in a normally controlled living environment, within a temperature range of 10-40°C, humidity levels between 30-90% and an atmospheric pressure range of 700hPa-1,060hPa.
  - The instrument should also be placed away from direct sunlight.
  - To ensure smooth operation, install the instrument on a level floor free of vibrations. Also, do not place anything on the instrument.
  - Connect all cables properly before using.
  - Use the power at a rated voltage.
  - When not in use, switch off the power source and apply the rubber cap and dust cover.
  - For accurate Photographing image, take care to keep the Photographing window clean and free of fingerprints, spots and dust.

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<b>[CAUTION]</b> Federal laws restricts this device to the sale by or on the order of a physician.
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Since this product partly uses a program derived from IPA Font, using the product is regarded as consent to the IPA Font License Agreement v1.0.

For the IPA Font License Agreement v1.0, the following URL.

[http://ipafont.ipa.go.jp/ipa\\_font\\_license\\_v1.html](http://ipafont.ipa.go.jp/ipa_font_license_v1.html)

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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 subject to change without prior notice and without legal obligation.
  3. 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.

4. Original Instructions

This manual was originally written in English.

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# CONTENTS

INTRODUCTION .....	1
GENERAL SAFETY INFORMATION.....	6
HOW TO READ THIS MANUAL .....	8
GENERAL MAINTENANCE INFORMATION .....	8
USER MAINTENANCE.....	8
CLEANING OF PHOTOGRAPHING WINDOW.....	8
DISCLAIMERS.....	8
DISPLAYS AND SYMBOLS FOR SAFE USE .....	9
DISPLAYS .....	9
SYMBOLS.....	9
POSITIONS OF WARNING AND CAUTION INDICATIONS .....	10
<b>COMPONENTS</b>	
COMPONENT NAMES.....	11
COMPOSITION OF PARTS WHICH CONTACT THE HUMAN BODY .....	11
OPERATION METHOD OF CONTROL PANEL .....	12
CONTROL PANEL COMPONENTS.....	13
PATIENT SCREEN (DICOM WORK LIST) .....	13
PATIENT SCREEN (ID INPUT).....	14
HOW TO INPUT A PATIENT ID .....	15
PHOTOGRAPHY SETTING SCREEN .....	17
PHOTOGRAPHING POSITION (SHOWING POSITION OF FIXATION TARGET)	
SELECTING SCREEN .....	18
CAPUTER SCREEN.....	19
PHOTOGRAPHING RESULT SCREEN.....	20
MANUAL EDITING SCREEN .....	21
THE CHECKING SCREEN IN THE MIDDLE OF PANORAMA PHOTOGRAPHY .....	22
RESULT SCREEN FOR PANORAMA PHOTOGRAPHY .....	22
LIST OF PRINTING ITEMS SCREEN .....	24
PRINTER OUTPUT .....	25
STANDARD ACCESSORIES .....	27
<b>PREPARATIONS</b>	
INSTALLATION .....	28
CONNECTING POWER CABLE .....	28
CONNECTING EXTERNAL I/O TERMINALS .....	29
DATA OUTPUT .....	29
IMAGEnet .....	30
DATA INPUT .....	30
PRINTER PAPER SETTING .....	31
RECOVERY FROM POWER SAVE STATUS.....	33
ADJUSTING THE CONTROL PANEL POSITION.....	33
<b>BASIC OPERATIONS</b>	
OPERATION FLOW CHART .....	34
PREPARATION BEFORE PHOTOGRAPHING (SEQUENCE COURSE) .....	35
TURN THE POWER ON. SET PATIENT ID.....	35
SELECT PHOTOGRAPHY POINT AND PATIENT'S EYE.....	36
PREPARATION OF PATIENT.....	37
PHOTOGRAPHY AND ANALYSIS RESULT DISPLAY .....	39
ALIGNMENT AND PHOTOGRAPHY .....	39
IN MANUAL ALIGNMENT .....	42

PRINT-OUT OF PHOTOGRAPHING DATA .....	44
DATA OUTPUT .....	44
OPERATION OF AFTER USE .....	45
<b>OPTIONAL OPERATIONS</b>	
FREE STYLE COURSE PHOTOGRAPHY .....	46
PANORAMA PHOTOGRAPHY .....	48
DISPLAYING THE PATIENT ID (PATIENT No.) OR OPERATOR ID .....	50
FOR DICOM WORK LIST .....	50
FOR ID INPUT .....	50
CELL ANALYSIS IN EDITING MODE .....	51
OUTPUT TO IMAGEnet SYSTEM .....	53
INPUT USING USB .....	54
OUTPUT USING LAN .....	54
<b>SETTING FUNCTIONS ON SETUP SCREEN</b>	
OPERATING THE SETUP SCREEN .....	55
PREPARATONS FOR SETTING .....	55
OUTLINE OF SETUP SCREEN OPERATIONS .....	56
RETURNING TO THE MEASUREMENT SCREEN .....	58
LIST OF SETUP ITEMS .....	59
INITIAL SETTINGS .....	59
INTERNAL PRINTER .....	60
EXTERNAL PRINTER .....	61
NETWORK SETTINGS .....	61
OPERATOR SETTINGS .....	63
<b>TROUBLESHOOTING</b>	
TROUBLE-SHOOTING OPERATIONS .....	64
MESSAGE LIST .....	64
TROUBLE-SHOOTING OPERATIONS .....	66
<b>SPECIFICATIONS AND PERFORMANCE</b>	
SPECIFICATIONS AND PERFORMANCE .....	67
<b>GENERAL INFORMATION ON USAGE AND MAINTENANCE</b>	
INTENDED PATIENT POPULATION .....	68
INTENDED USER PROFILE .....	68
ENVIRONMENTAL CONDITIONS OF USE .....	68
STORAGE, USAGE PERIOD .....	68
ENVIRONMENTAL CONDITIONS FOR PACKAGING IN STORAGE .....	68
ENVIRONMENTAL CONDITIONS FOR PACKAGING IN TRANSPORTATION .....	69
ELECTRIC RATING .....	69
SAFETY DESIGNATIONS PER IEC 60601-1 STANDARD .....	69
DIMENSIONS AND WEIGHT .....	69
OPERATION PRINCIPLE .....	70
CHECKPOINTS FOR MAINTENANCE .....	71
DISPOSAL .....	71
ELECTROMAGNETIC COMPATIBILITY .....	72
REQUIREMENTS FOR THE EXTERNAL DEVICE .....	75
PATIENT'S ENVIRONMENT .....	76
<b>REFERENCE</b>	
OPTIONAL ACCESSORIES .....	77
SHAPE OF PLUG .....	77
<b>MAINTENANCE</b>	
MAINTAINING ACCURACY .....	78
PHOTOGRAPHING WINDOW .....	78
BRIGHTNESS ADJUSTMENT OF CONTROL PANEL .....	78

DAILY CHECKUPS.....	78
DAILY MAINTENANCE .....	78
ORDERING CONSUMABLE ITEMS .....	78
USER MAINTENANCE ITEM.....	79
MANUFACTURER MAINTENANCE ITEMS .....	79
PRINTER PAPER JAM.....	80
SUPPLYING THE CHINREST TISSUE.....	81
MAINTENANCE.....	82
CLEANING THE INSTRUMENT.....	82
CLEANING THE PHOTOGRAPHING WINDOW GLASS .....	82
CLEANING THE COVER .....	83
CLEANING THE CONTROL PANEL.....	83
CLEANING THE FOREHEAD REST AND CHIN REST.....	83
<b>SP-1P SOFTWARE LICENSE TERMS .....</b>	<b>84</b>

# GENERAL SAFETY INFORMATION



## WARNINGS

### Ensuring the Safety of Patients and Operators

When operating the instrument, do not touch the patient's eye or nose.

Handling the cord on this product or cords associated with accessories sold with this product, will expose you to lead, a chemical known to the State of California to cause birth defects or other reproductive harm. Wash hands after handling.

### Preventing Electric Shocks and Fires

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.



## CAUTIONS

### Ensuring the Safety of Patients and Operators

To avoid injury when operating the up/down button for the chinrest, be careful not to catch the patient's fingers.

The light emitted from this instrument involves potential risk; the longer the irradiation time, the more risk of damage to the eye.

When the instrument operates with the maximum light volume, exposure for more than 2 hours will exceed the safety guideline.

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

### Preventing Electric Shocks and Fires

To avoid injury by electric shock, do not open the cover. For repair, call your service engineer.

### Electromagnetic Compatibility (EMC)

This instrument has been tested (with 100/120/230V) and found to comply with IEC60601-1-2:Ed.3.0:2007. 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 10 before using the machine.
- Regarding connection to various devices, see "CONNECTING EXTERNAL I/O TERMINALS" on page 29.
- If you would like an overview of the system, begin by reading "BASIC OPERATIONS"(page 34).
- For setting various functions, see "SETTING FUNCTIONS ON SETUP SCREEN" on page 55.

## GENERAL MAINTENANCE INFORMATION

### 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 82.




## 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 User 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.









# 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 the User 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.

## DISPLAYS

DISPLAY	MEANING
 <b>WARNING</b>	A WARNING is provided to alert the user to potential serious outcomes (death, injury, or serious adverse events) to the patient or the user.
 <b>CAUTION</b>	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.
 <b>NOTES</b>	A NOTE is provided when additional general information is applicable.

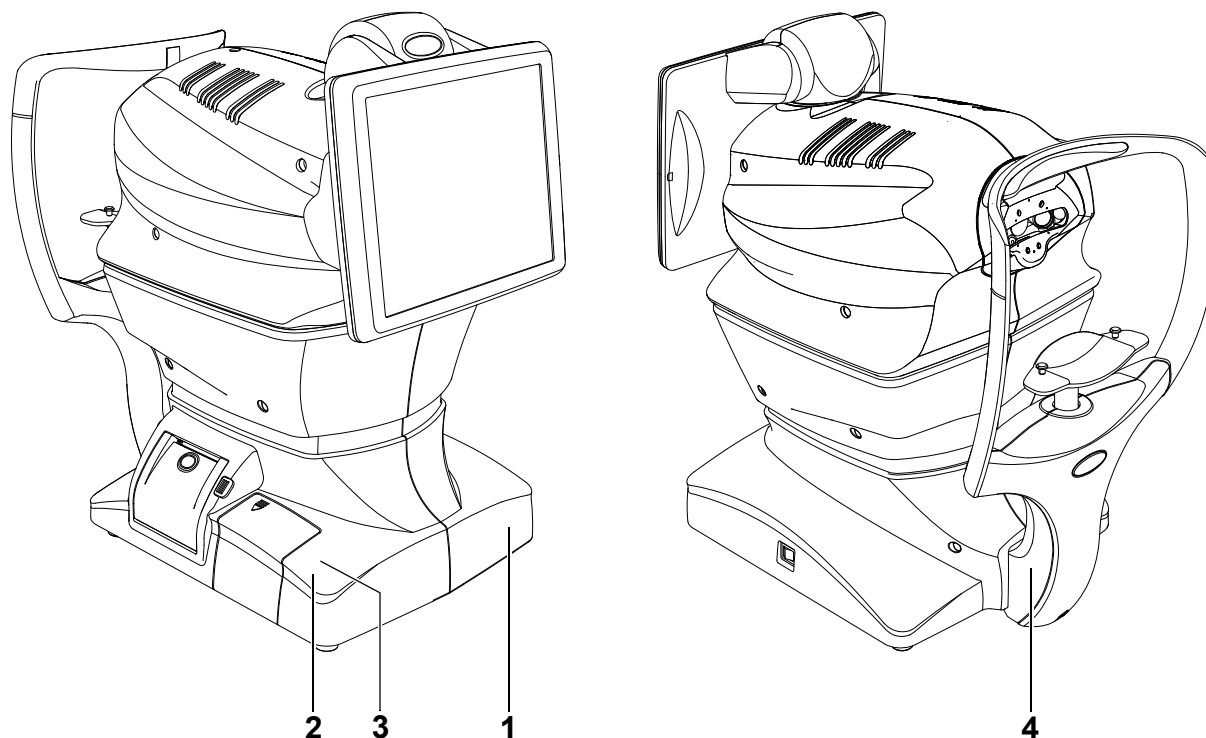
## SYMBOLS





Symbol	IEC/ISO Publication	Description	Description (French)
	IEC 60417-5032	Alternating Current	Courant alternatif
	IEC 60417-5008	Off (power: disconnection from the main power supply)	Éteint (courant: coupure avec le secteur)
	IEC 60417-5007	On (power: connection to the main power supply)	Allumé (courant: raccordement sur le secteur)
	IEC 60878-02-02	Type B applied part	Partie appliquée du Type B
	ISO 7010-W001	General warning sign	Symbole d'avertissement général
	ISO 7010-M002	Refer to instruction manual/ booklet	Voir le manuel/la brochure
	ISO 7000-2497	Date of manufacture	Date de fabrication
	ISO 7000-2498	Serial number	Numéro de série

# 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
1		<b>WARNING</b> To avoid injury caused by electric shock, do not open the cover. Ask your dealer for service.
2		<b>CAUTION</b> Be careful not to hit the patient's eyes or nose with the instrument during operation. The patient may be injured.
3		<b>CAUTION</b> When operating the chinrest up/down switch, be careful not to pinch the patient's hand. The patient may be injured.
4		Degree of protection against electric shock: TYPE B APPLIED PART



# COMPONENTS

## COMPONENT NAMES

### Main body Section

Photographing head

Control panel

### Power unit Section

Printer cover open switch

Printer cover

External I/O terminal cover

### Chinrest Section

Power inlet

POWER switch

Forehead rest<sup>\*1</sup>

Photographing window

Eye height mark

Chinrest tissue pin

Chinrest<sup>\*1</sup>

\*1: Contacting part (class B)

## COMPOSITION OF PARTS WHICH CONTACT THE HUMAN BODY

Forehead rest : Silicone rubber

Chinrest : Acrylonitrile butadiene styrene resin

## OPERATION METHOD OF CONTROL PANEL

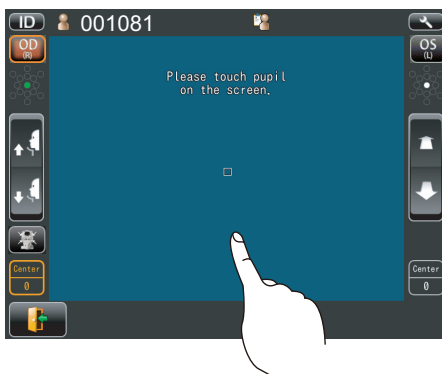
The control panel is designed as a touch panel for performing various operations and settings. It displays images and shows information, including set conditions and photographing results.



### NOTE

- 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.

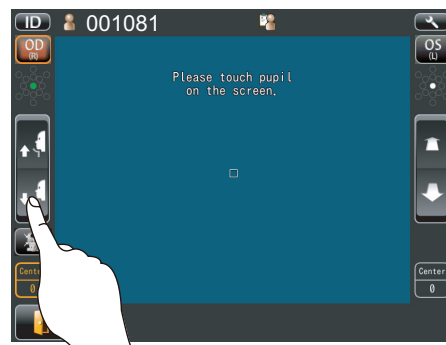
Tap → To select any relevant item.



Touch the control panel softly with a finger.

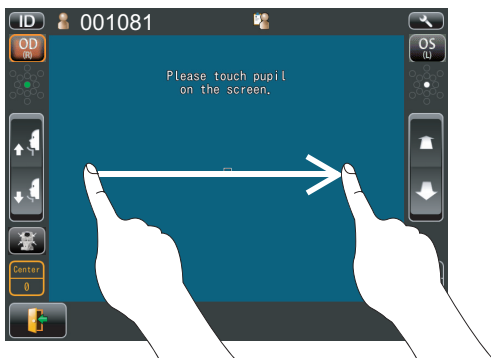
Continue to press →

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



Continue to touch the screen softly with a finger.

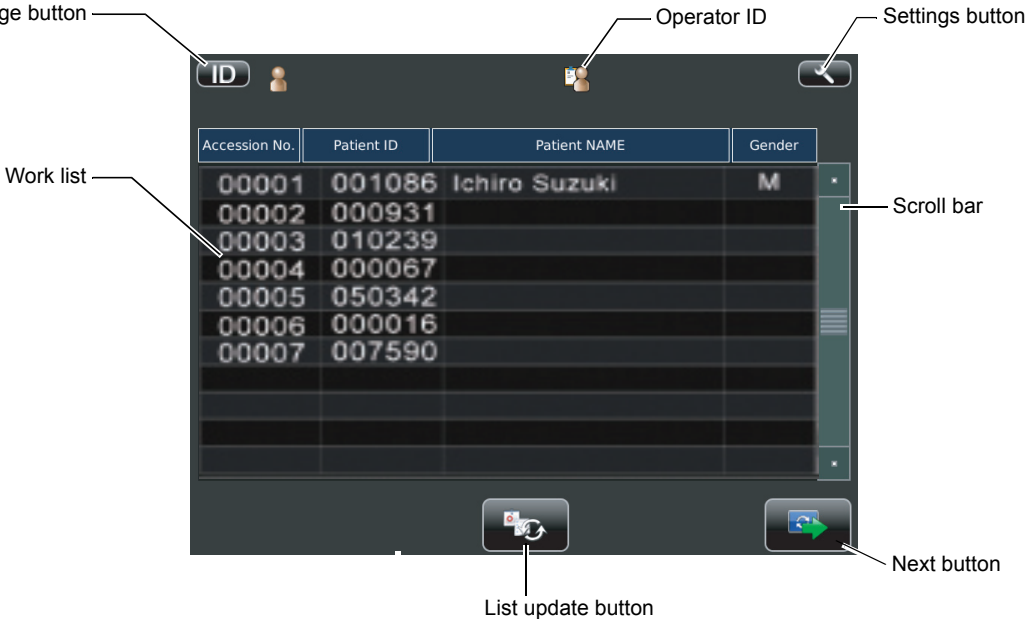
Drag → Under manual alignment.










Touch and move on screen softly with a finger.

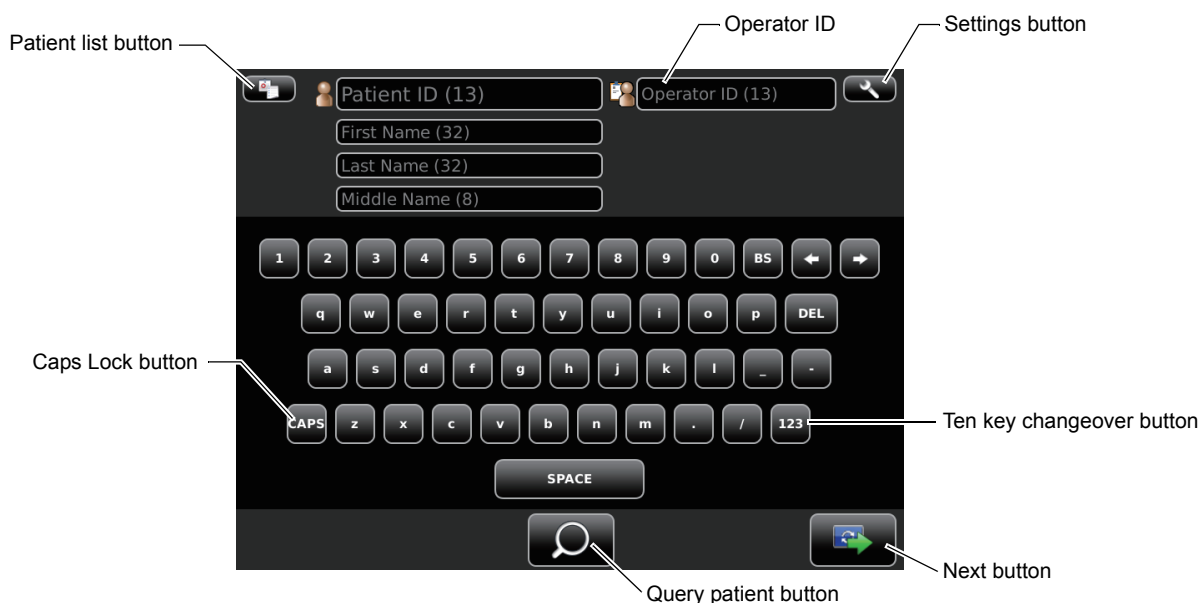
CONTROL PANEL COMPONENTS







PATIENT SCREEN (DICOM WORK LIST)



-  Patient ID input change button.....A patient screen is switched to ID input.
-  Work list .....The work list which is gained by DICOM MWM (Modality Work list Management) server is shown.
-  List update button .....Select this list to select a patient.
-  Operator ID .....When Fixed operator ID is off, the button is tapped and patient screen appears waiting operator ID input.
-  Settings button .....Displays the Setup screen.
-  Scroll bar .....When there are many work lists, the following hidden list is displayed.
-  Next button .....Patient selecting is complete and moves to photography setting screen is set.

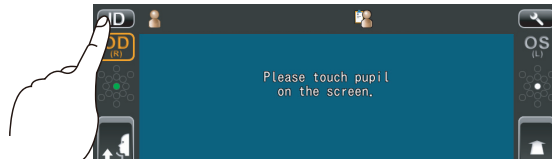
## PATIENT SCREEN (ID INPUT)



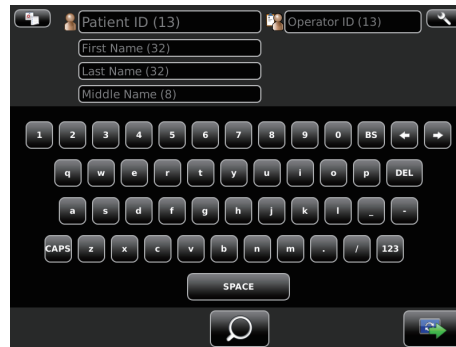
	Patient list button .....	Displays the Patient screen (DICOM work list). This button displays when the setting in the Setup screen is ON in "Use DICOM" of "NETWORK SETTINGS". (P.61)
	Caps Lock button .....	The letters on software keyboard changes Capital/small.
	Settings button .....	Displays the Setup screen.
	Ten key changeover button .....	Layout of software keyboard changes QWERTY/Ten key.
	Next button .....	Patient selecting is complete and photography setting screen is set.
	Query patient button .....	Query the inputted patient in the DICOM work list. This button displays when the setting in the Setup screen is ON in "Use DICOM" of "NETWORK SETTINGS". (P.61)

## 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.

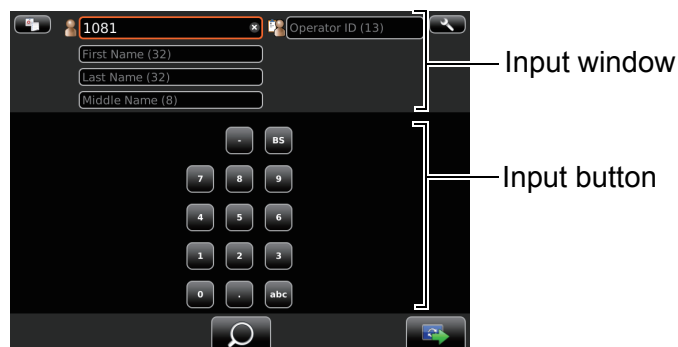


- 3 Enter the Patient ID tapping the **Input button**.



- 4 If you need to input numeral by ten-key, ten-key input screen appears by tapping the **Ten key changeover button**.

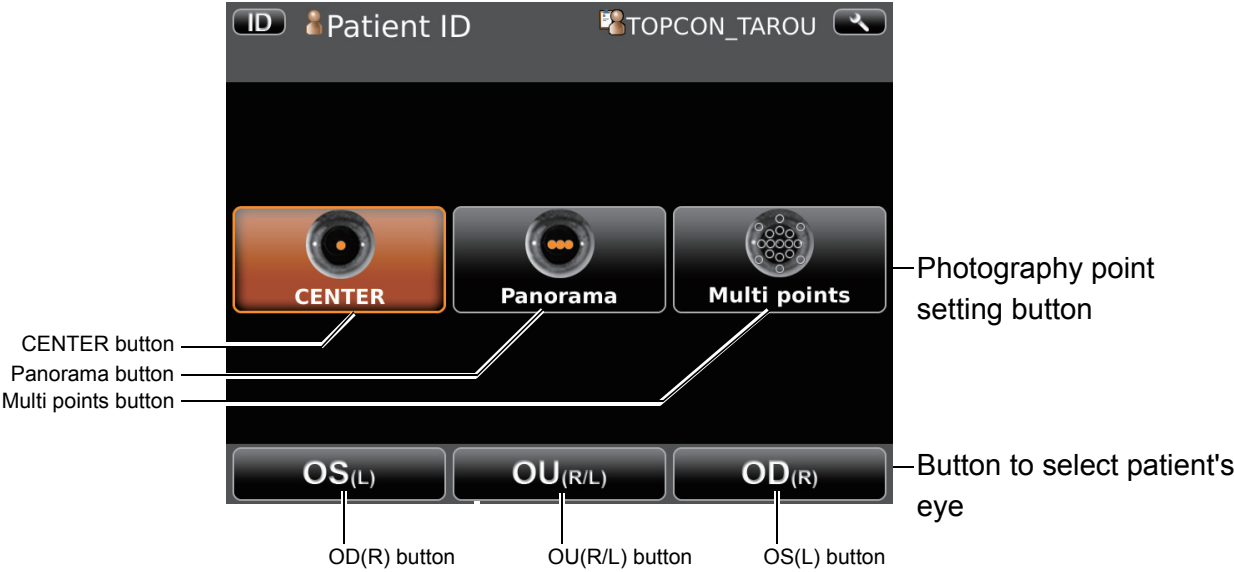
Input in same manner above 2-3.



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



PHOTOGRAPHY SETTING SCREEN



CENTER button .....Centering 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.



OD(R) button.....Photographs right 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.

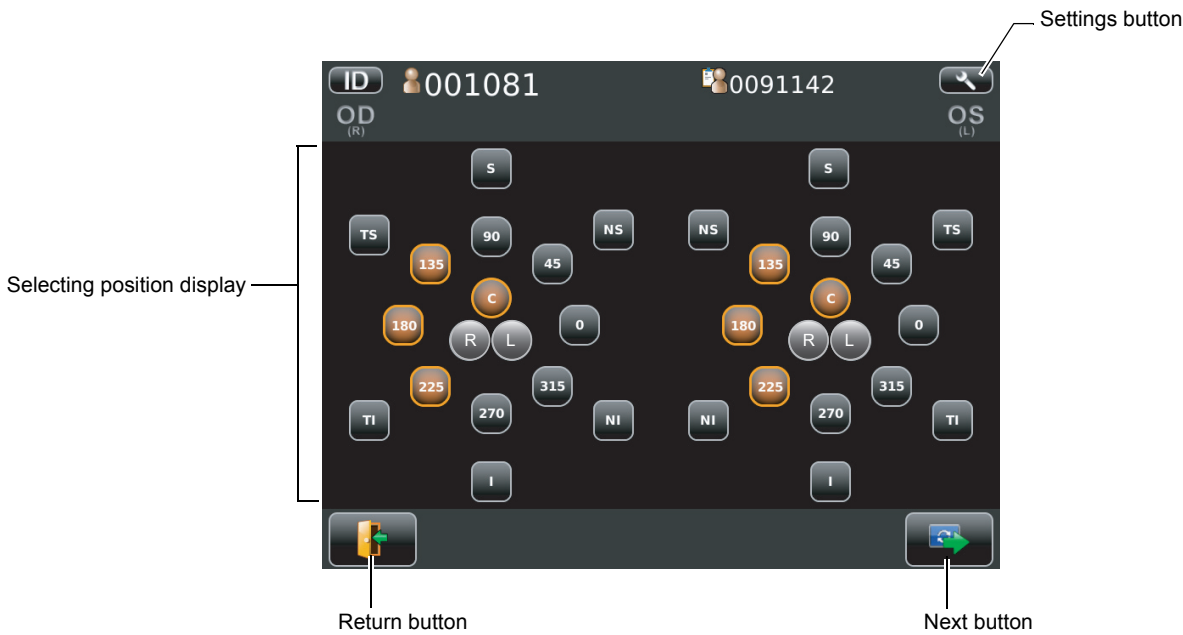


OS(L) button.....Photographs left eye only in the selected photography point. If selection is complete, moves to capture screen.


- 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 FFIXATION 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.

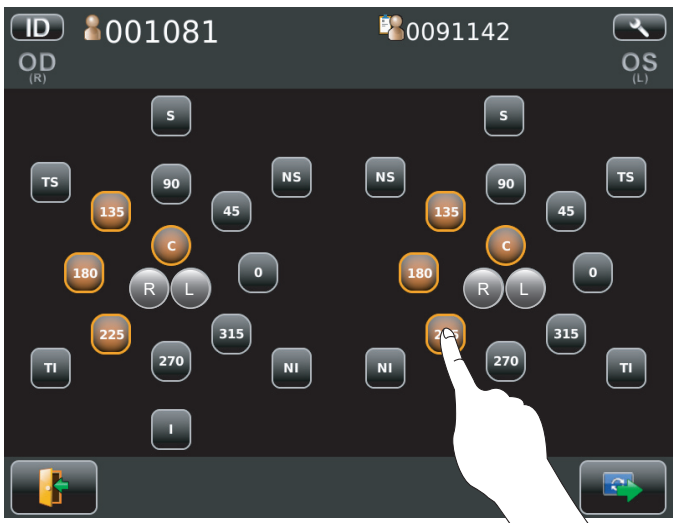
 Settings button .....Displays Setup screen.

 Return button .....What 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.



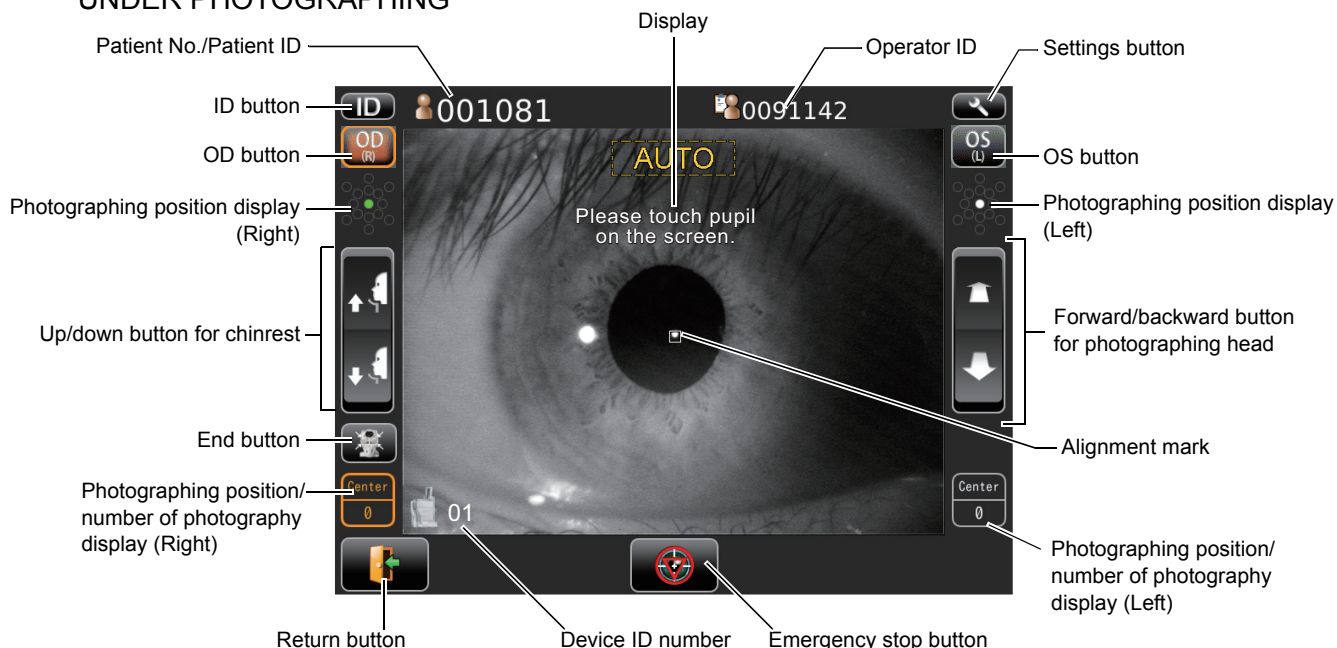
- The fixation target is lighted on diagonal location for selecting the desired position.



## 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** 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 63 regarding on the settings)

**OD OS** 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** Up/down button for chinrest .....Moves the chinrest up/down.

**Forward/Backward** 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** Settings button.....Displays the Settings screen.

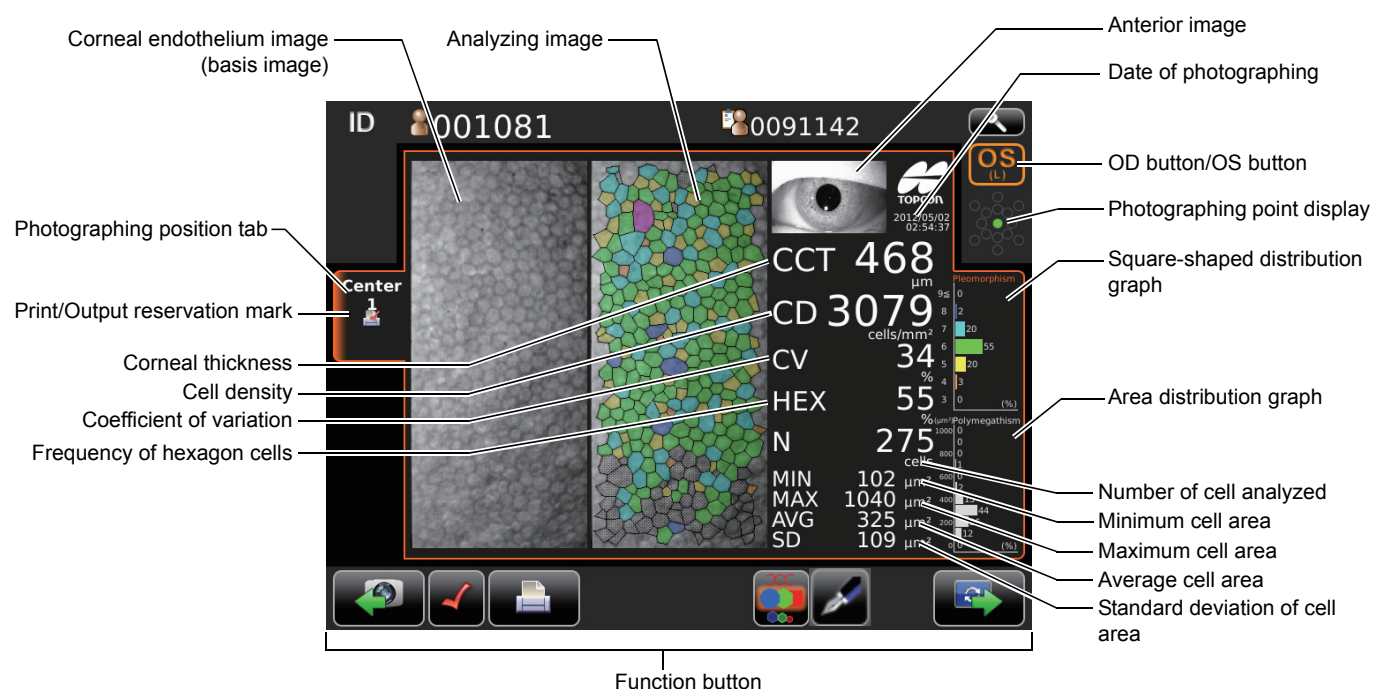
**Photographing position display** .....The position selected is colored in orange. The position on which photography is complete is shown by white circle.

**End** End button .....Move the chinrest and photographing head to the last position.

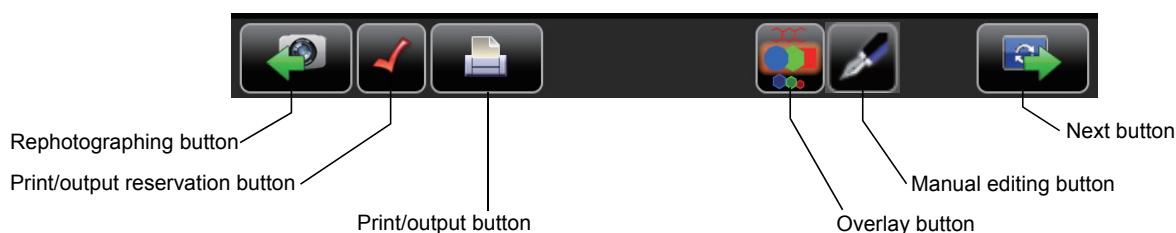
**C 2** Photographing position/number of photography display.....Displays contemporary Photographing position selected and number of photographing.







**Emergency stop** Emergency stop button .....Appears only when automatic operation is carried out. The operation stops immediately.

## PHOTOGRAPHING RESULT SCREEN



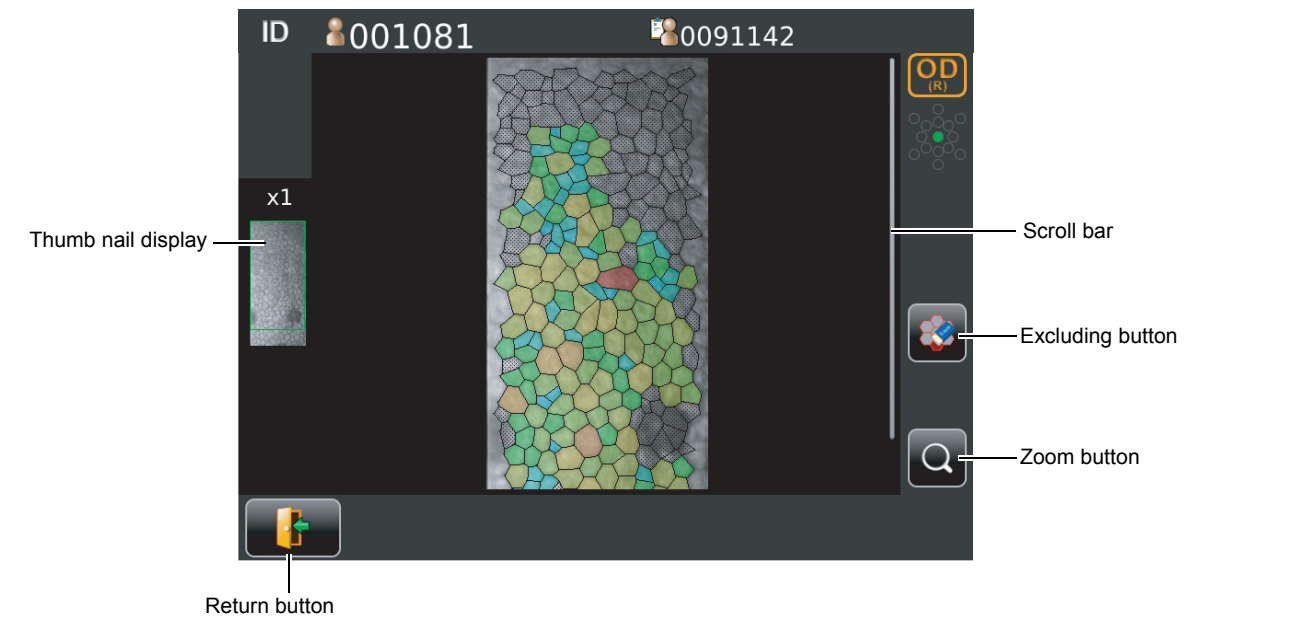
## FUNCTION BUTTON






-  Rephotographing button .....Photographing the same position.(The screen changes for Photographing.)
-  Print/output reservation button .....This is shown only when more than 2 times photographed on the same position.  
Data contemporarily displayed is set to print/output.
-  Print/output button .....Printing/output carried out according to the settings.
-  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.
-  Overlay button.....Classifies the image to analyze in color according to the number of cell's angle or cell area.
-  Manual editing button .....Moves to the screen for manual editing.

MANUAL EDITING SCREEN

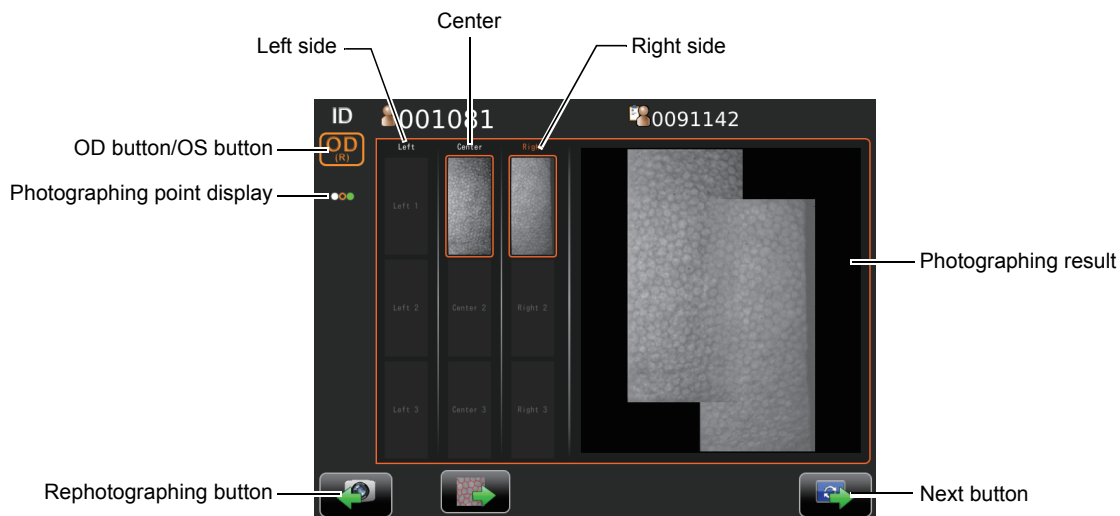
Screen for editing the result of automatic cell analysis.



Thumb nail display .....	When the image is enlarged the enlarged area is shown. The area is flamed in green.
Scroll bar .....	Uses to show the hidden list by dragging up and down.
 Excluding button .....	Exclude the cell specified form analysis while remains boundary line of cell.
 Zoom button .....	Enlargement/reduction of image is done. When enlarged, you can move the area to be displayed by dragging corneal endothelium image.
 Return button .....	What is edited is canceled returning to the screen for analyzing result image.

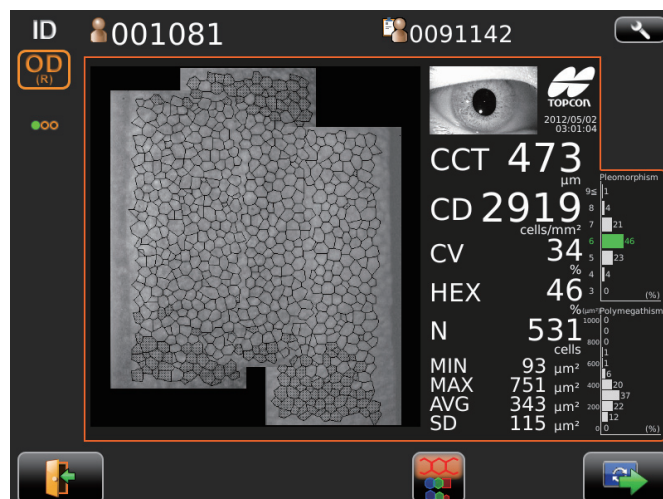
## THE CHECKING SCREEN IN THE MIDDLE OF PANORAMA PHOTOGRAPHY

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

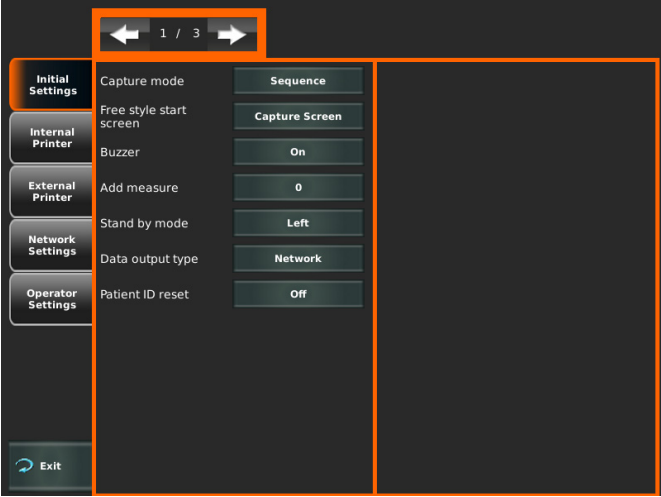


## RESULT SCREEN FOR PANORAMA PHOTOGRAPHY

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.


 Patient ID

OD(R)		
Position	Date/Time	Status
Center	2012-05-02/02:53:28	Reserved

 TOPCON\_TAROU

OS(L)		
Position	Date/Time	Status
Center	2012-05-02/02:54:37	Reserved

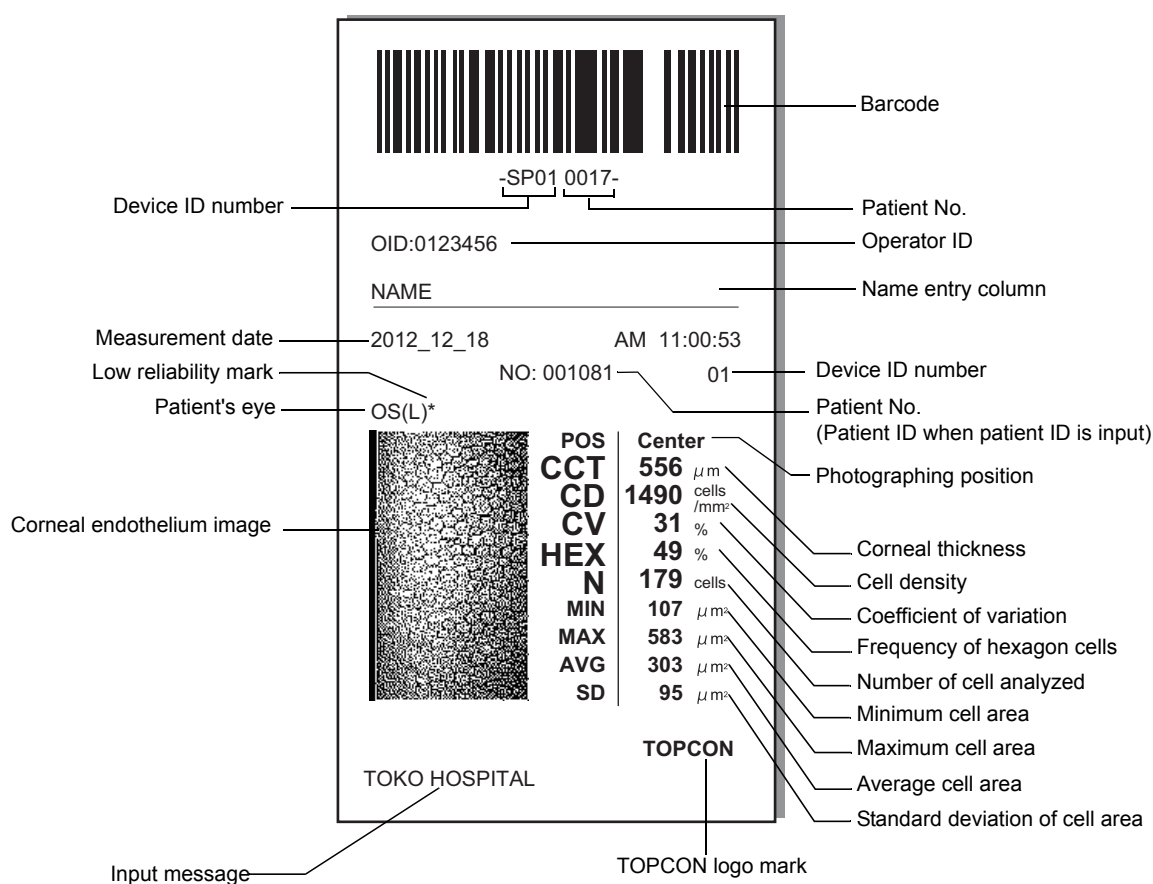




If the reliability is low, the character is displayed in yellow.


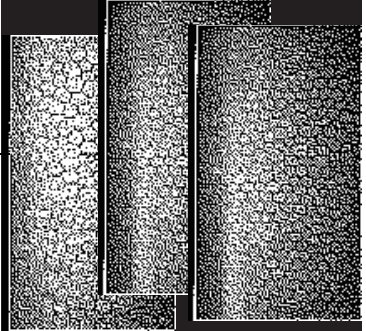
## PRINTER OUTPUT

### PRINTOUT OF SINGLE EYE PHOTOGRAPHED



- As for the patient No., the result of the printing will differ depending on whether the patient ID is inputted or not inputted.  
 Input : Patient ID is printed.  
 Not input : Patient No. (starts from 0001, automatically added +1 upon completion of measurement) is printed.
- If the reliability is low, low reliability mark(\*) is outputted.


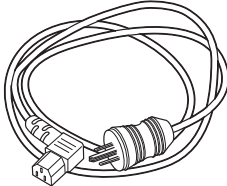

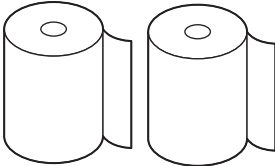
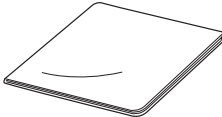
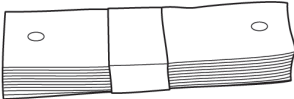
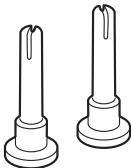
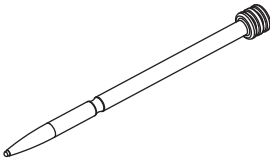
## PRINTOUT OF PANORAMA PHOTOGRAPHED

			Barcode
Device ID number	SP01_0017		Patient No.
	OID:0123456		Operator ID
	NAME		Name entry column
Measurement date	2012_12_18	AM 11:00:53	
	NO: 001081	01	Device ID number
Patient's eye	OD(R)		Patient No. (Patient ID when patient ID is input)
	<b>CCT</b>	556 $\mu\text{m}$	
Corneal thickness	<b>CD</b>	1490 cells/mm <sup>2</sup>	
	<b>CV</b>	31 $\mu\text{m}$	
Cell density	<b>HEX</b>	49 %	
Coefficient of variation	<b>N</b>	179 cells	
Frequency of hexagon cells	<b>MIN</b>	107 $\mu\text{m}^2$	
Number of cell analyzed	<b>MAX</b>	583 $\mu\text{m}^2$	
Minimum cell area	<b>AVG</b>	303 $\mu\text{m}^2$	
Maximum cell area	<b>SD</b>	95 $\mu\text{m}^2$	
Average cell area			
Standard deviation of cell area			
Corneal endothelium image			
Input message	TOKO HOSPITAL	TOPCON	TOPCON logo mark



**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> 

# PREPARATIONS

## INSTALLATION

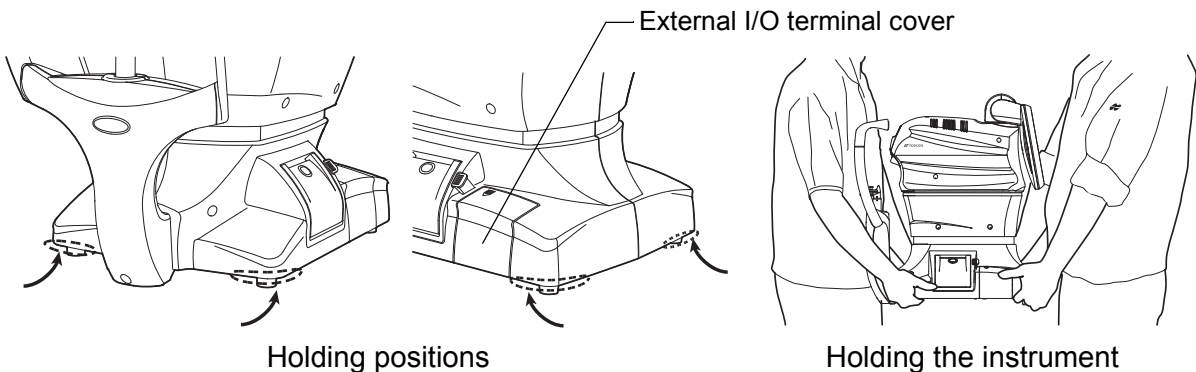


### CAUTION

- 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 injury 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. For the adjustable instrument table, see "OPTIONAL ACCESSORIES" on page 77.



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

## CONNECTING POWER CABLE



### WARNING

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.

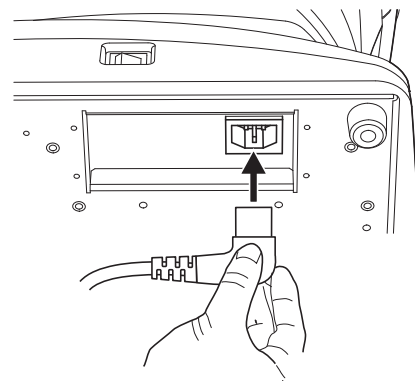


### CAUTION

To avoid electric shocks, do not handle the power plug with wet fingers.

- 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.



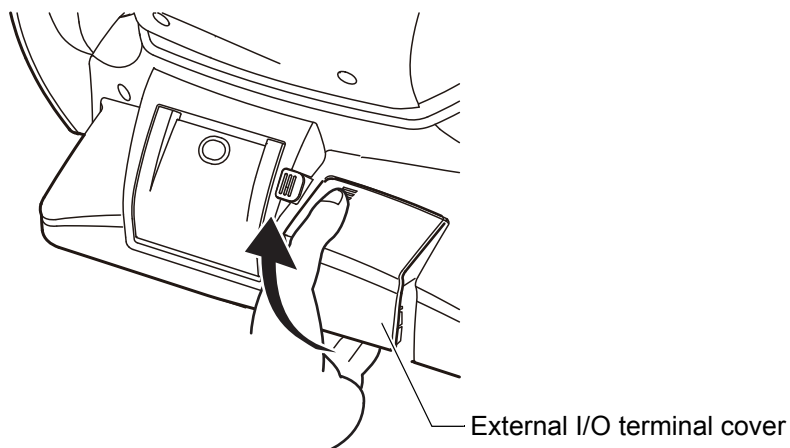
### **NOTE**

When connecting this product with a commercial personal computer, use one conforming to IEC60950-1.

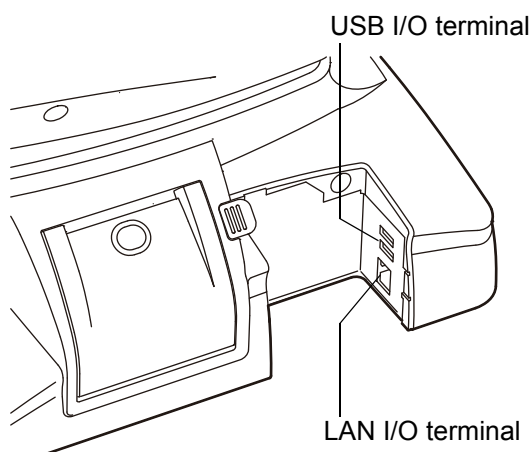
## **DATA OUTPUT**

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

- 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

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



### NOTE

- For questions about connections, contact your TOPCON dealer.
- When you use a hub, use the USB hub with power supply.

## **PRINTER PAPER SETTING**



### **CAUTION**

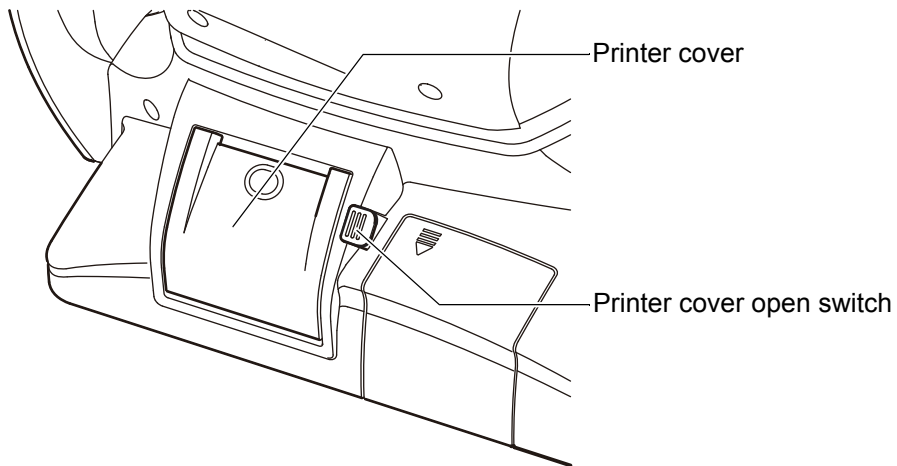
- To avoid failure or potential injury, do not open the printer cover while the printer is in operation.
- To avoid potential injury in case of malfunction, including a paper jam, be sure to shut off the power before attempting to repair it.
- To avoid potential injury, do not touch the printer body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



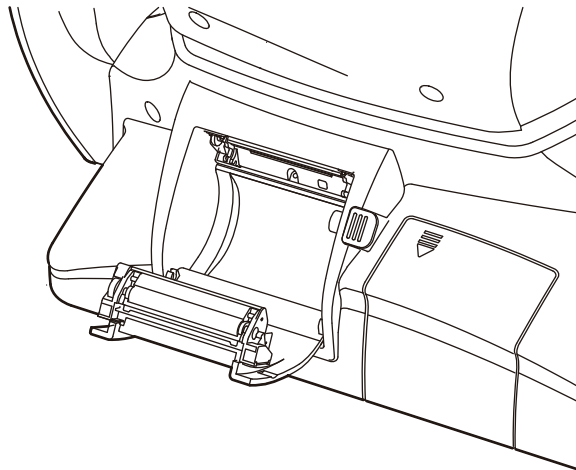
### **NOTE**

If you insert the printer paper backwards, printing will not start.

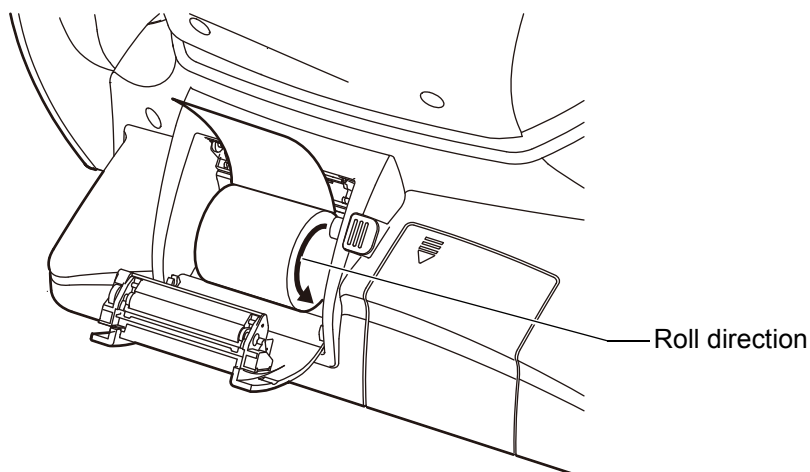
- 1** Press the printer cover open switch to open the printer cover.



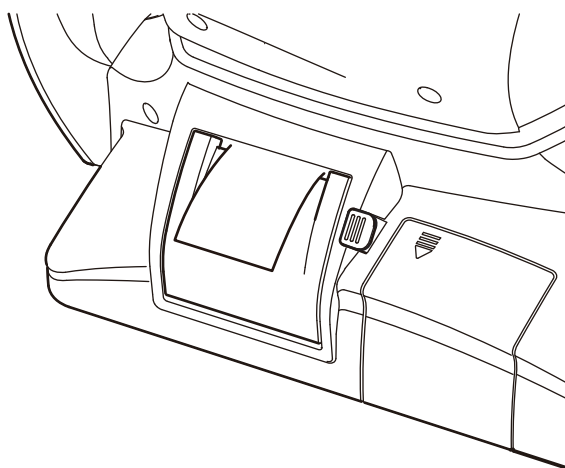
- 2** Open the printer cover to the limit.



- 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.
  - A 58mm wide paper roll is recommended. For the printer paper, see "ORDERING CONSUMABLE ITEMS" on page 78.
- Other paper rolls may cause abnormal printing noise or unclear print.

## 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.

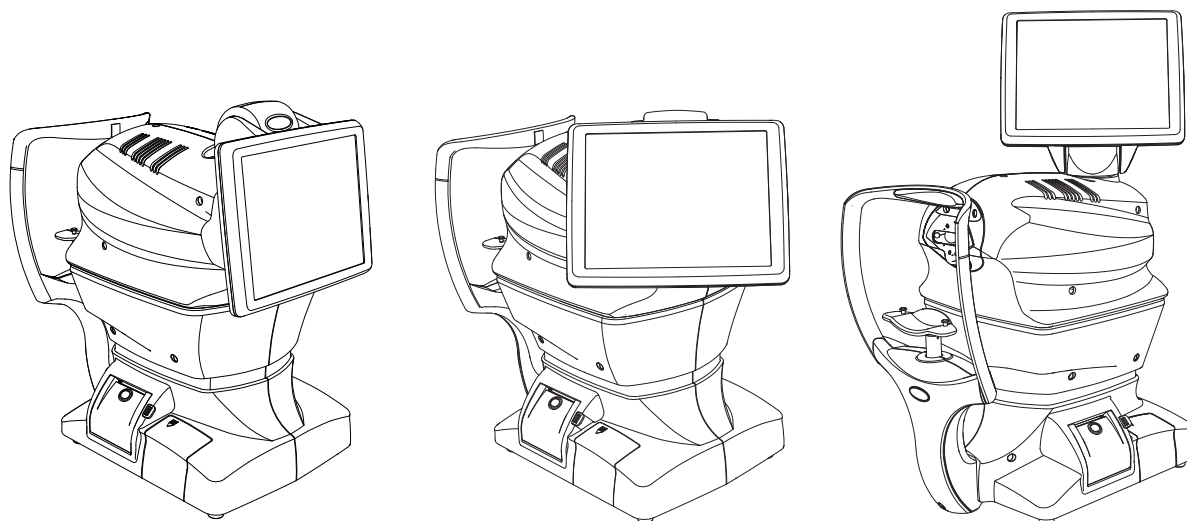


### NOTE

The time to start the power save status can be changed in the initial setting "Auto power save" (see page 59).

## 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.

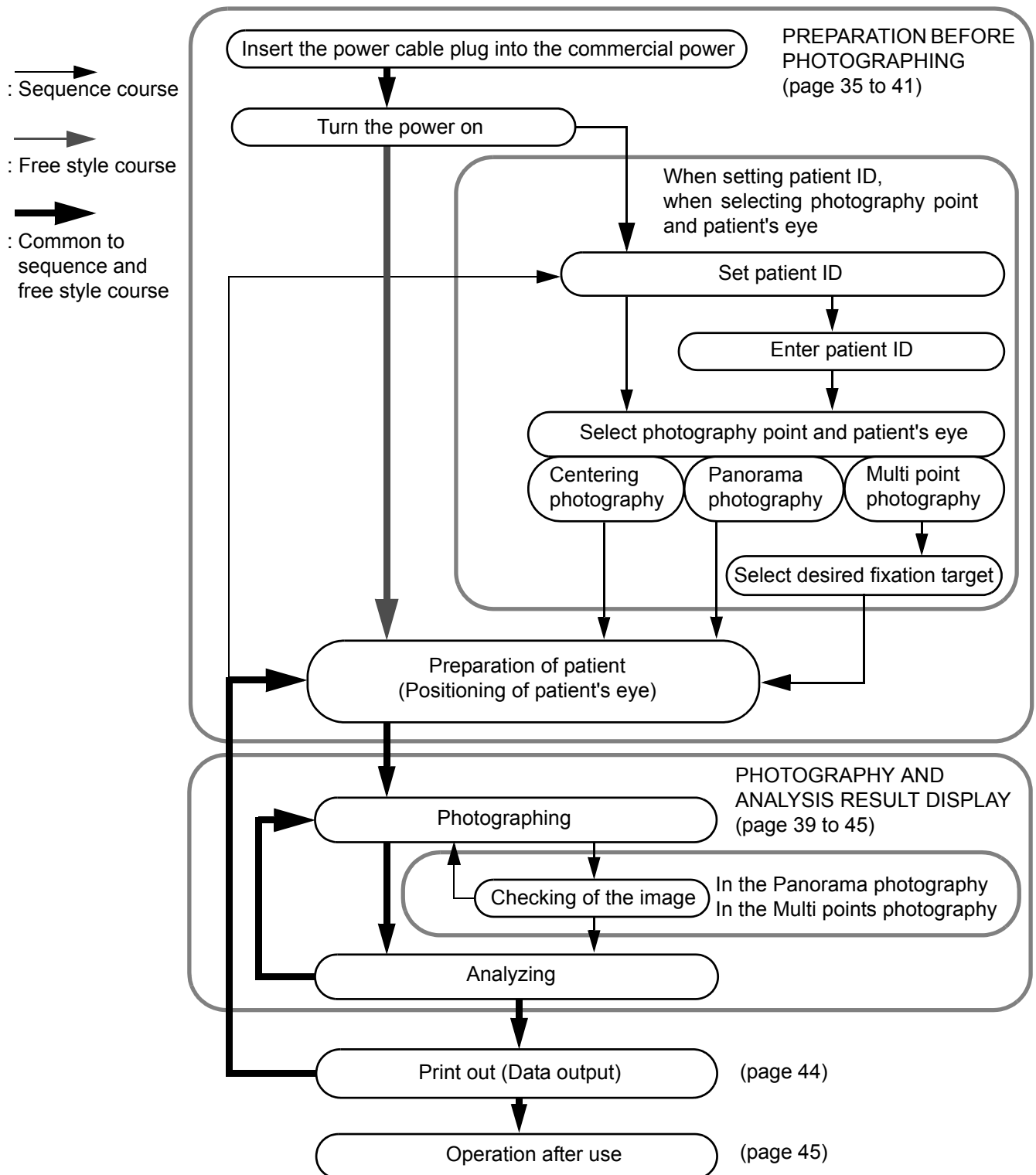


# BASIC OPERATIONS

## 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.46)





## PREPARATION BEFORE PHOTOGRAPHING (SEQUENCE COURSE)



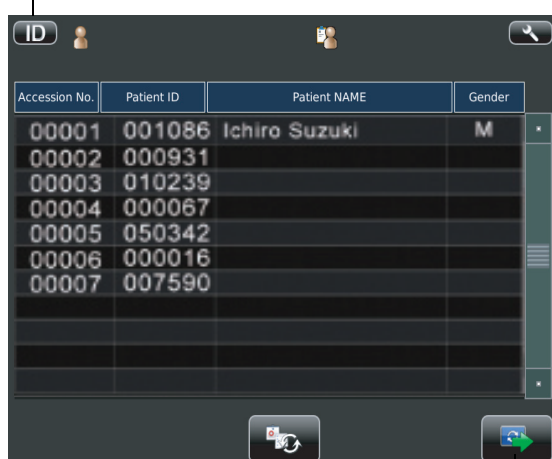
### NOTE

- 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.

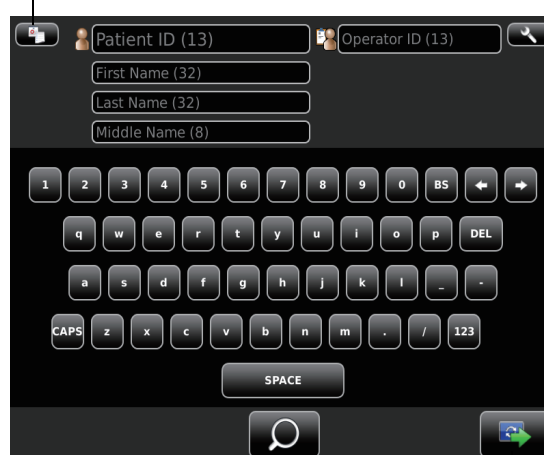
### TURN THE POWER ON. SET PATIENT ID.

- 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 28.
- 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.

Patient ID input change button



Next button

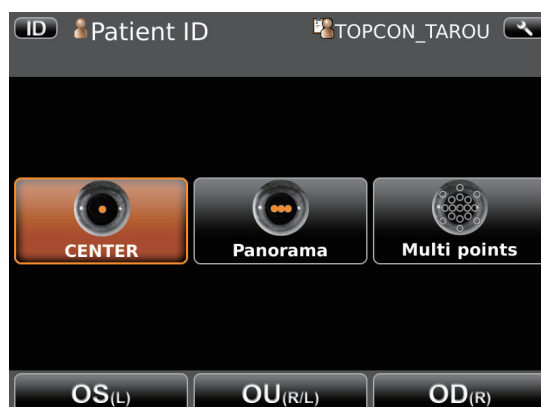


Patient screen for DICOM work list

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 15 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 Multi points button is selected, select the photographing position on the Photographing position selecting screen. For the details see the 18 pages.

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



OS(L) button..... Photographs right 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 left 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.

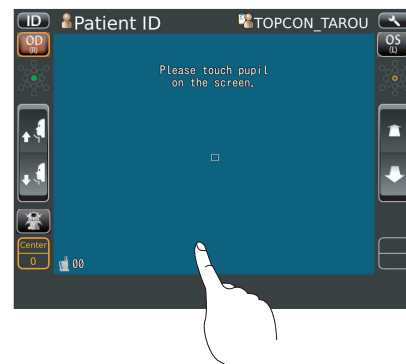
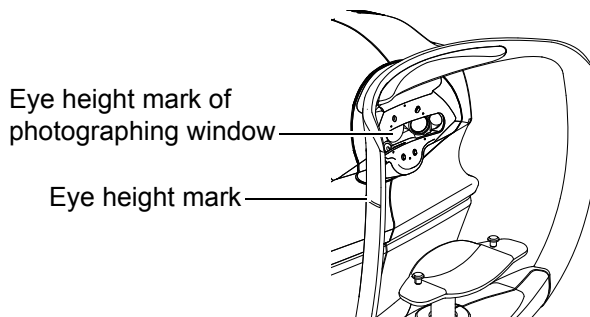


### NOTE

- 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 83.
- If no patient ID is registered, a "patient No." is assigned and displayed automatically in order of examination.

**1** Check the capture screen.

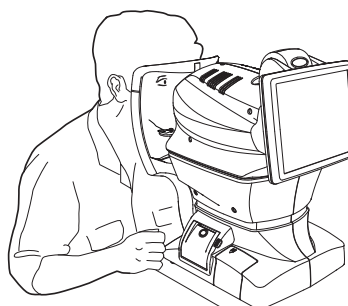
**2** Make sure that Photographing window is at the height of the eye height mark. Move the photographing head until photographing window is at the height of the eye height mark, if photographing window is above the eye height mark press the lower side of the control panel display, or if it is beneath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



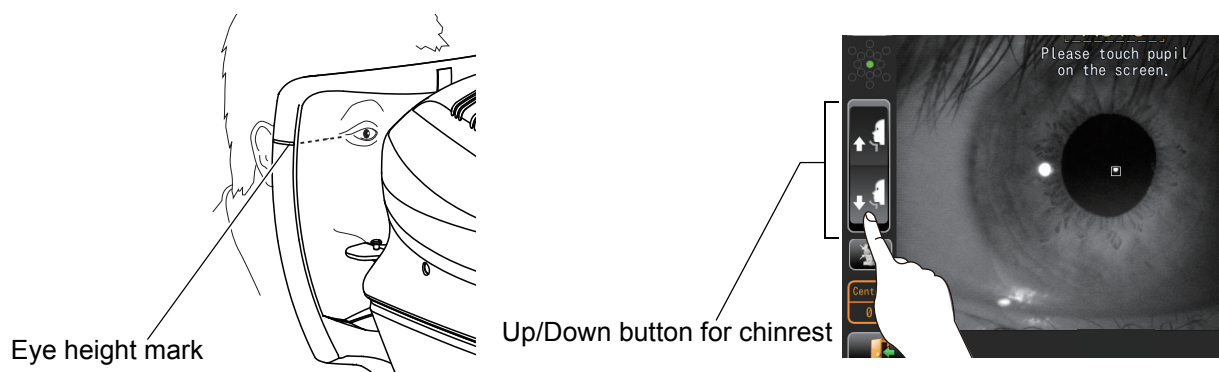
**3** Have the patient sit in front of the instrument.

**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

 <b>NOTE</b>	<ul style="list-style-type: none"><li>• 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.</li><li>• 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.</li><li>• 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 83.</li><li>• 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 mode.</li></ul>
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### ALIGNMENT AND PHOTOGRAPHY

Alignment can be operated from the control panel.

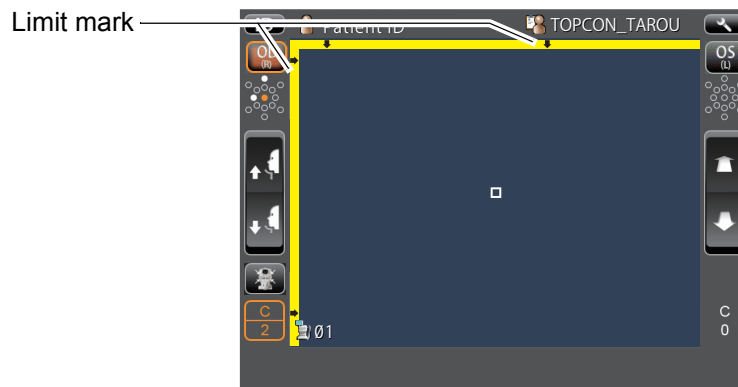
- 1** Have the patient look at the fixation target (blinking in green.) in the photographing window. If blinking in green stops tell the patient suppress so to suppress eye blinking approx.3 seconds. (Photographing is carried out at this time.)
- 2** When the pupil is displayed, tap the area around the 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.

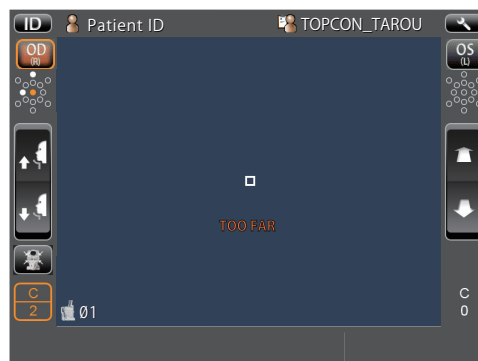
 <b>NOTE</b>	<ul style="list-style-type: none"><li>• When "Please touch pupil on the screen." is displayed, please confirm if the patient's eye fits normal conditions for measuring. Then tap the pupil on the control panel again.</li><li>• When the alignment status has continued for more than 30 seconds, the operation stops telling "Please touch pupil on the screen". Tap the photographing Head Forward/Backward button to focus. Then tap the pupil on the control panel again.</li></ul>
---	---

- 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.

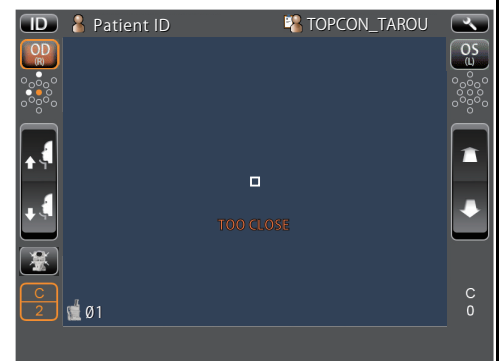


## NOTE

- 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.



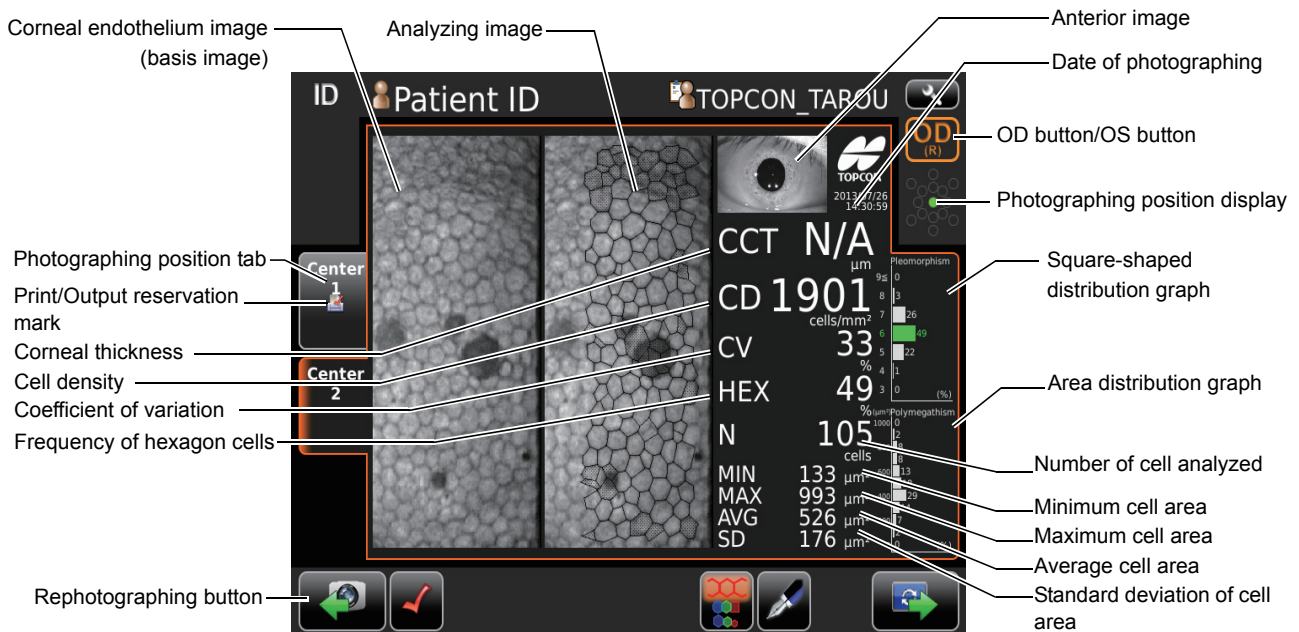
Limit of movement in the backward direction




Limit of movement in the forward direction

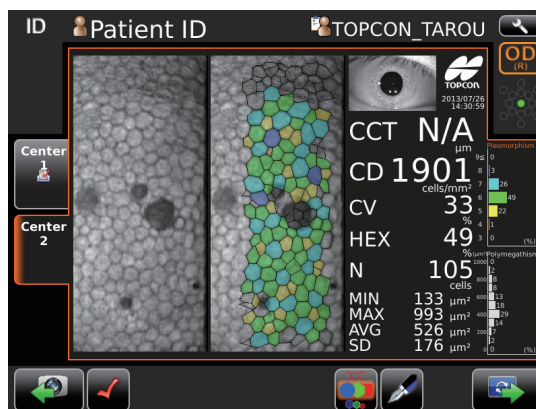
- For manual alignment , refer to page 42 "IN MANUAL ALIGNMENT".

## Results of Photography and analysis.

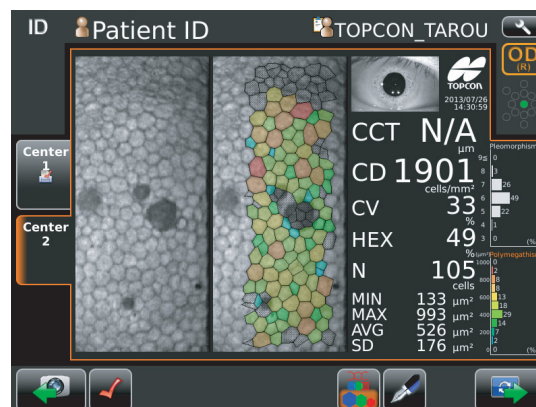


- If photography is required again, return to the capture screen by tapping **Rephotographing button**. Then you can photograph again.
- The analyzing image is classified in color according to number of angle of cell and area of cell by tapping overlay button .

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 not colored and displayed with black boundary line and dot is excluded from analyzed value calculation.

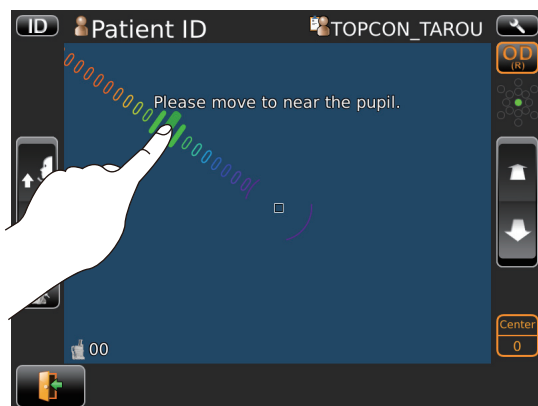


- 4** Under "Panorama photography" is set, the procedure is follows; "photographing" - "check the photographing result" - "photographing" - "check the photographing result", then repeat same procedure. Photographing is performed at three points as center, ear side, and nose side.
- Under "Multi points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

### IN MANUAL ALIGNMENT

To keep pressing on the screen, the instrument moves to the direction from center of screen to the pressed point.

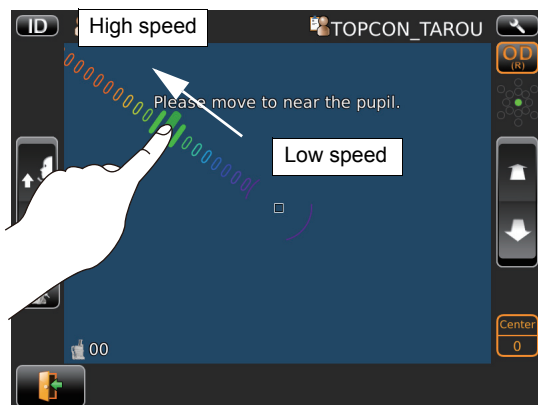
It is possible to change the direction by dragging on the screen, too. The instrument does not move even if you press around center of screen without the bar.



### NOTE

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

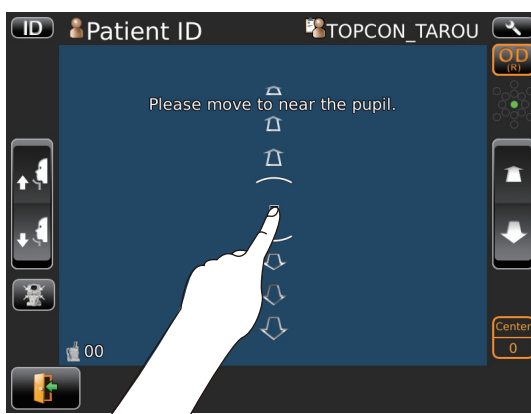
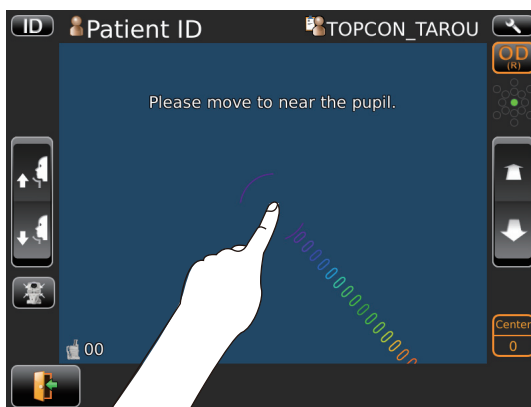
Moving speed is higher than away from a screen center.



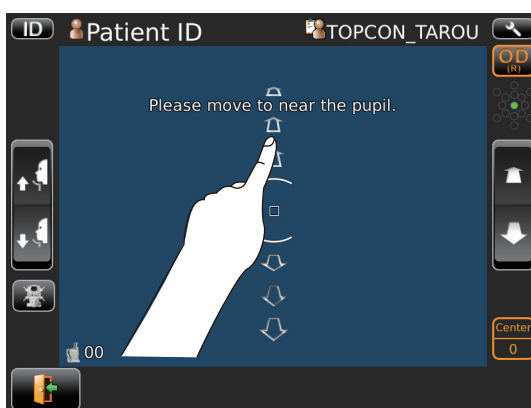


During vertical/lateral directions movement, the movement mode is changed to back /forth by tapping (at one second) the center of screen.

## NOTE



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






# PRINT-OUT OF PHOTOGRAPHING DATA




- 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  is displayed on Photographing result screen.
  - If Panorama photography, Multi points photography and Binocular photography is selected,  does not appear until all specified photographing is completed.
- 2 List of printing items screen is displayed.




## Patient ID





## TOPCON\_TAROU

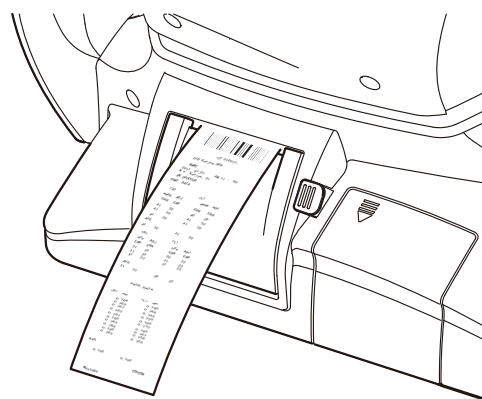
OD(R)		
Position	Date/Time	Status
Center	2012-05-02/02:53:28	Reserved

OS(L)		
Position	Date/Time	Status
Center	2012-05-02/02:54:37	Reserved





- 3** Tap the  on the List of printing items screen.
- Photographing values on the List of printing items screen are printed out.



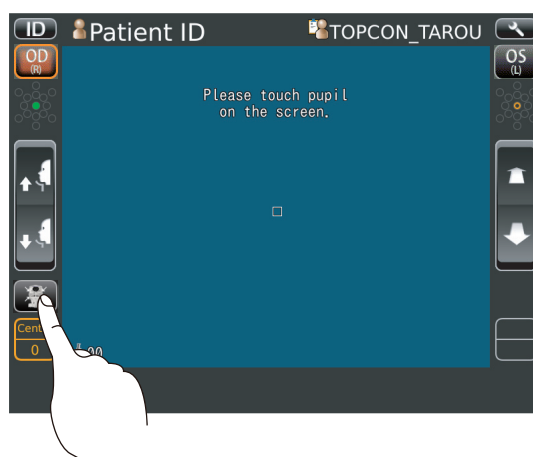
- When a red line is printed at the end of the printer paper, replace it with a new one. For details about the replacement of printer paper, see "PRINTER PAPER SETTING" on page 31. 58mm wide printer paper is recommended. For the printer paper, see "ORDERING CONSUMABLE ITEMS" on page 78.
- "CLOSE PRT 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

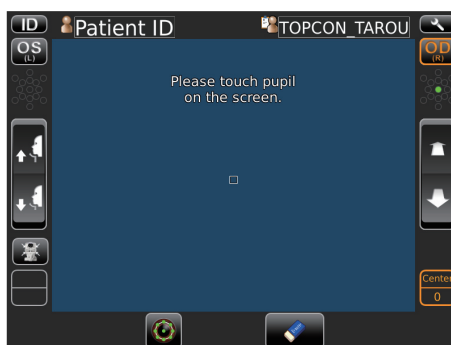
In the free style course, it is possible to capture an eye as soon as the power turns on; selecting the patient's ID, photography point or patient's eye is not required.



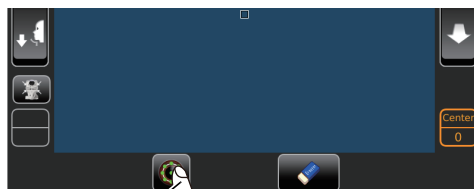
### NOTE

- To change to free style course form the sequence course the setup screen is used.
- Regarding how to change, see P.55-59.
- 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.48.





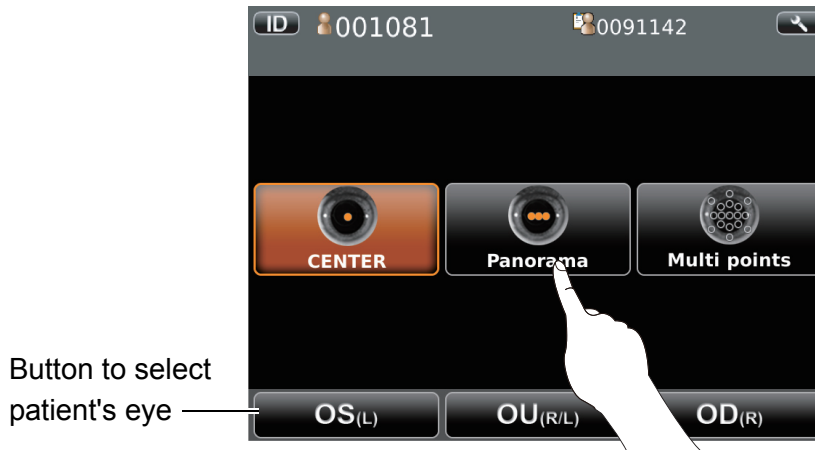
## **PANORAMA PHOTOGRAPHY**

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 35)

**2** Tap the Panorama button.

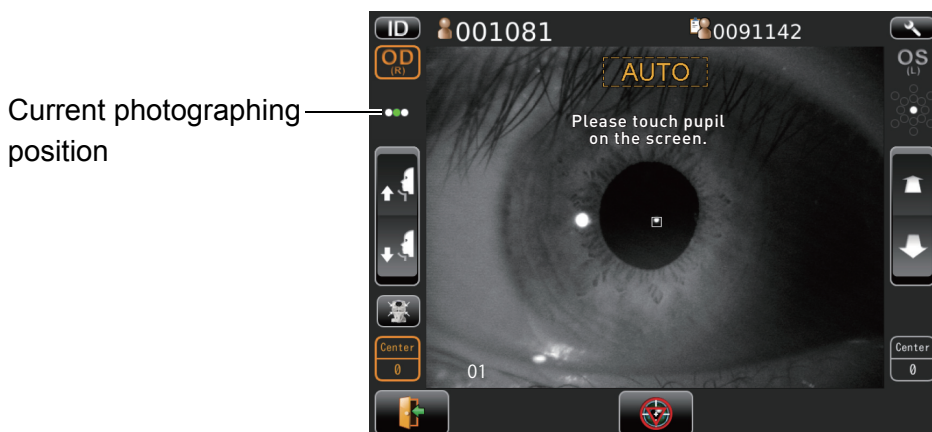


**3** Select the patient's eye by tapping the button to select patient's eye. Then move to the screen for observation.

**4** Please prepare to photograph for patient. (Refer to page 37)

**5** Have the patient look at the fixation target (green) in the photographing window.

**6** Tap the pupil on the screen.



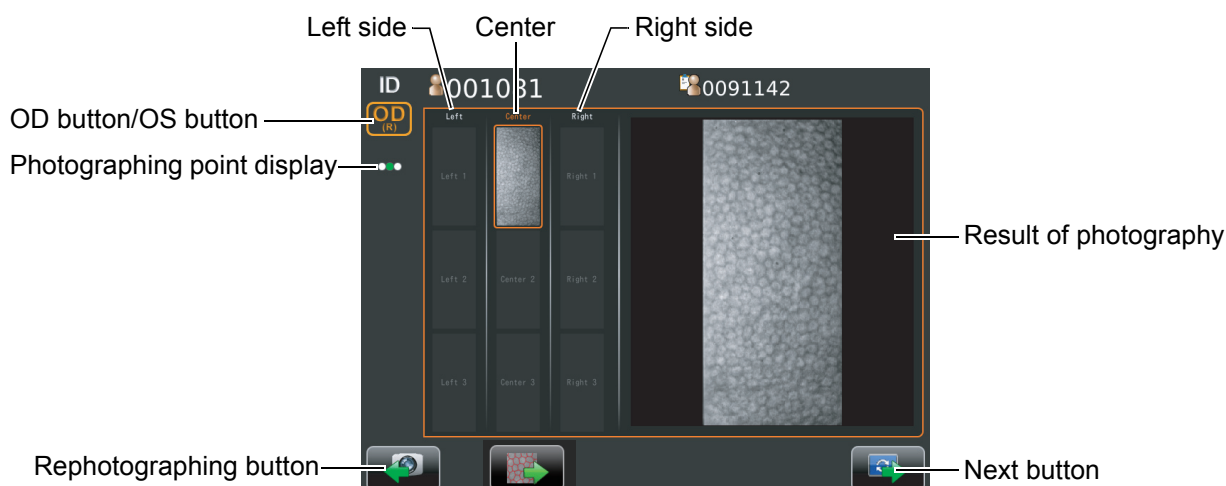
The alignment is performed automatically and photographs.

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

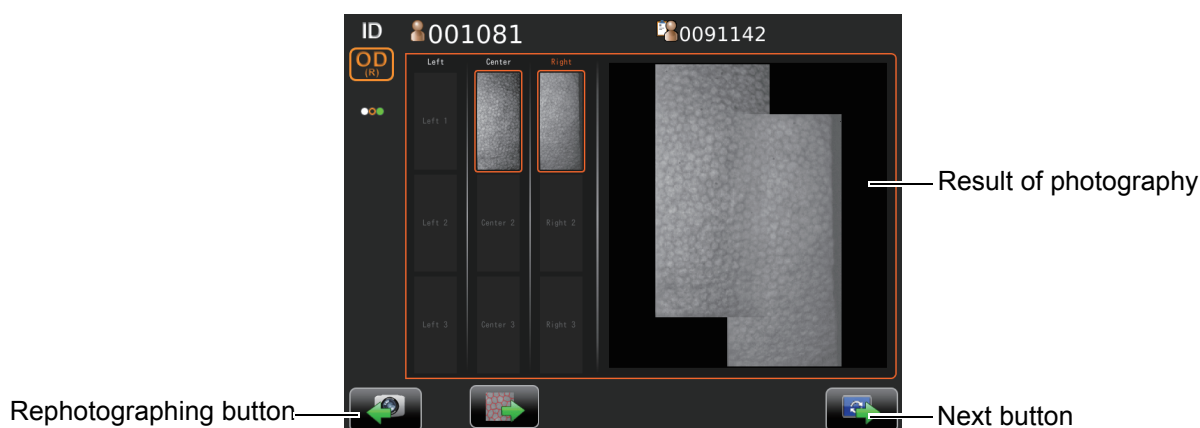
**7** Preview of result of photography is shown.

Until photographing next point, the patient has a break.

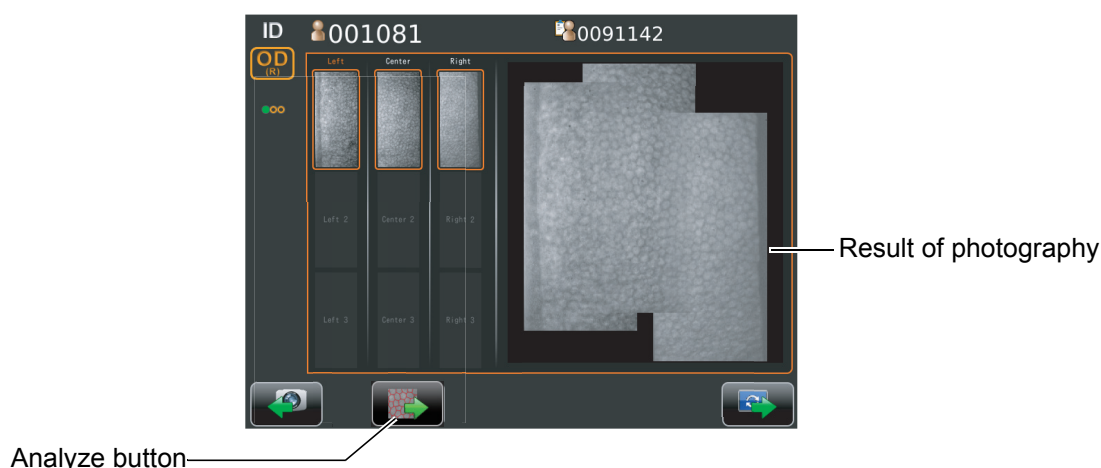
- 8** Check the result of photography. If photography is required again, tap the **Rephotographing** button.



- 9** Tap the **Next button** to photograph next position. The capture screen is shown. Photograph the same manner in Step4-7 (page 48). The image is displayed in combined image with previous one.



Repeat checking the photographing image and photographing next position in the same manner so that photographing is performed at 3 points.



- 10** 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.



- 11** Check the analyzing result and if required tap the Print/Output button to print/output the result.

Analyzing screen of combined image



Print/Output button

- 12** The List of printing items screen is displayed, then tap the print/output button. The analyzing result is printed.



- 13** 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.

## **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.

### **FOR DICOM WORK LIST**

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

### **FOR ID INPUT**

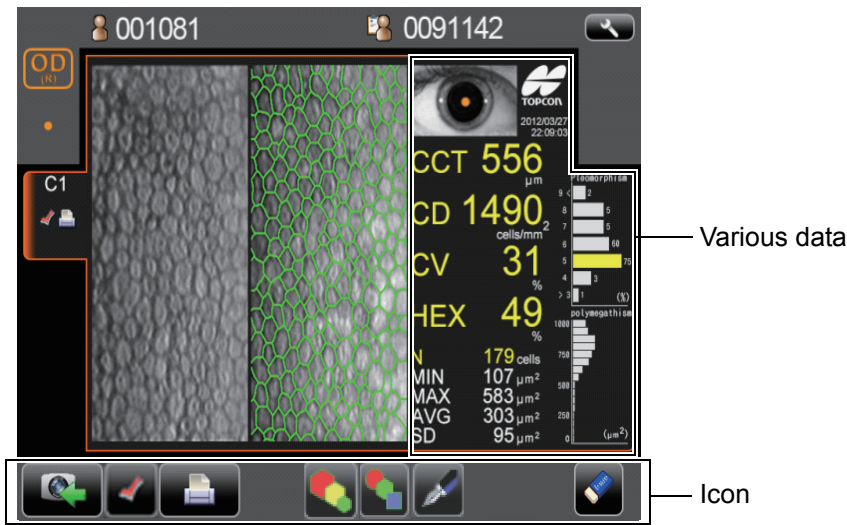
- 1** Tap the keyboard on the display to enter the ID.
- 2** Tap the photography settings changeover button so that the selection is complete.
  - In work list method, patient ID change over button can be used to change to ID input method.
  - Keyboard layout can be changed qwerty/ten key by means of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



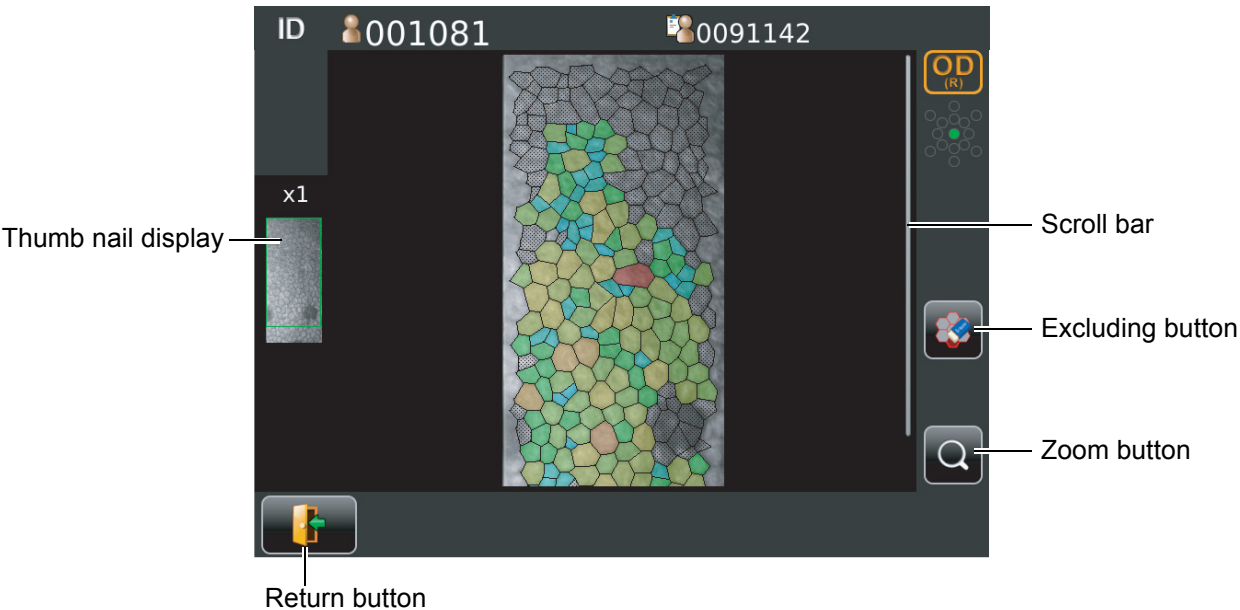
**CELL ANALYSIS IN EDITING MODE**

If the detailed mode setting is ON, editing button is shown. 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 display .....When the image is enlarged the enlarged area is shown. The area is flamed in green.
- Scroll bar .....Uses to show the hidden list by dragging up and down.
- Excluding button.....Exclude the cell specified form analysis while remains boundary line of cell.
- Zoom button .....Enlargement/reduction of image is done.
- When enlarged, you can move the area to be displayed by dragging corneal endothelium image.
- Return button.....Return to Analysis result screen. (The changes are discarded.)

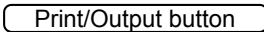
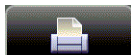
- 3** Tap the Analyze button, then the message of "Are you sure to apply change?" is displayed.



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.

## OUTPUT TO IMAGEnet SYSTEM

- Set LAN output to ON.
- 1** Check the connection of IMAGENet system.  
For connection, refer to "CONNECTING EXTERNAL I/O TERMINALS" on page 29.
- 2** Photographing is performed at all position.
- 3** Tap the  on the screen to display the List of printing items screen.
- 4** Tap the  on the List of printing items screen.

[illegible]

The image is automatically captured into IMAGEnet system.

## **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 29.
- 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 29.
- 2** Set up of LAN connection settings.  
For details, refer to "NETWORK SETTINGS" on page 61.
- 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 64.

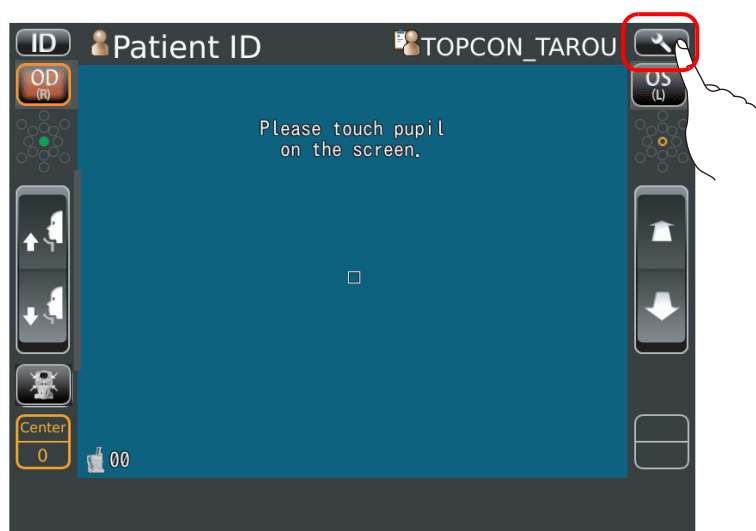
# SETTING FUNCTIONS ON SETUP SCREEN

## OPERATING THE SETUP SCREEN

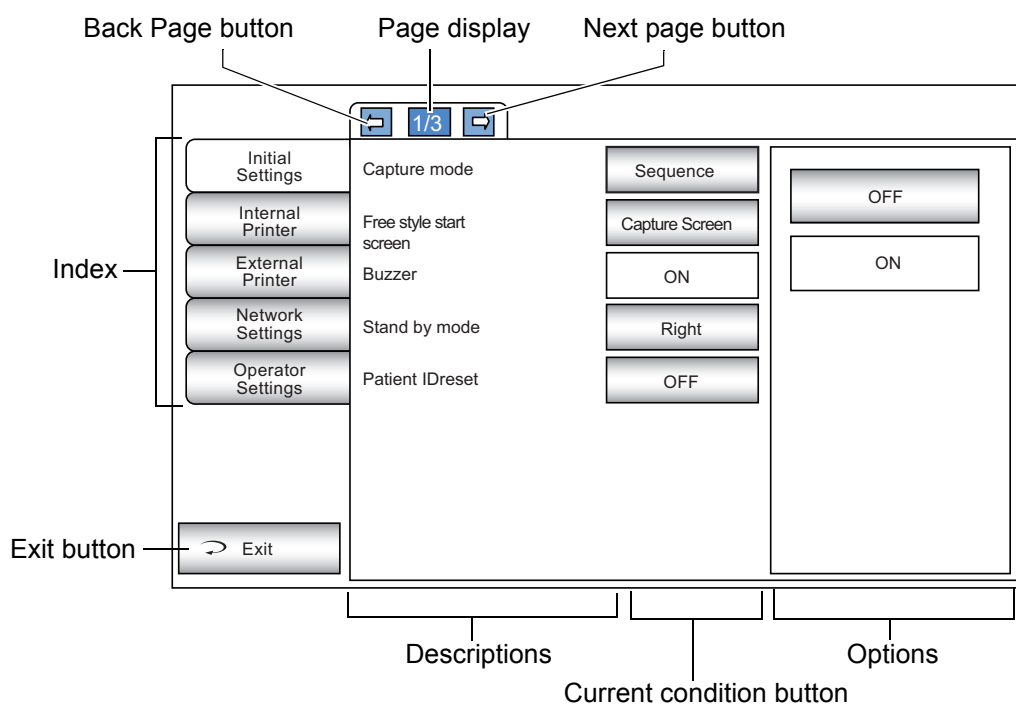
Various functions can be set on the SETUP screen.

### PREPARATONS FOR SETTING

- 1 Make sure that the power cable is connected.  
For connection, refer to "CONNECTING POWER CABLE" on page 28.
- 2 Turn ON the **POWER** switch.
- 3 Tap the **SETTINGS** button on the control panel.

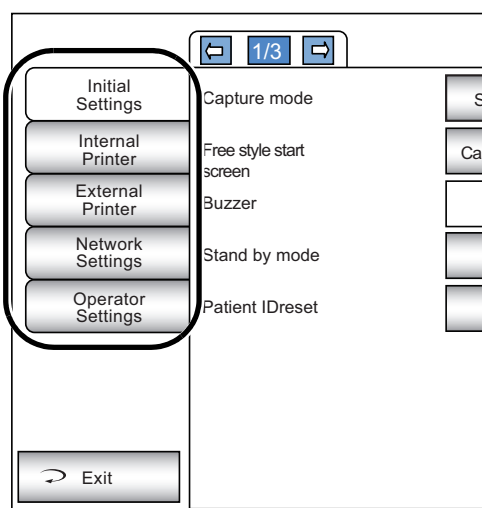


The SETUP screen is displayed.

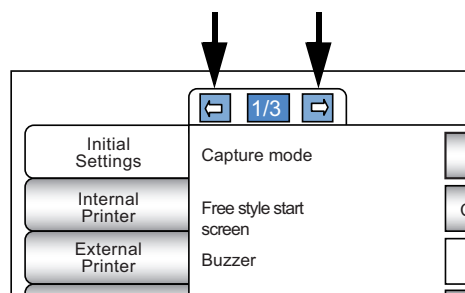


## OUTLINE OF SETUP SCREEN OPERATIONS

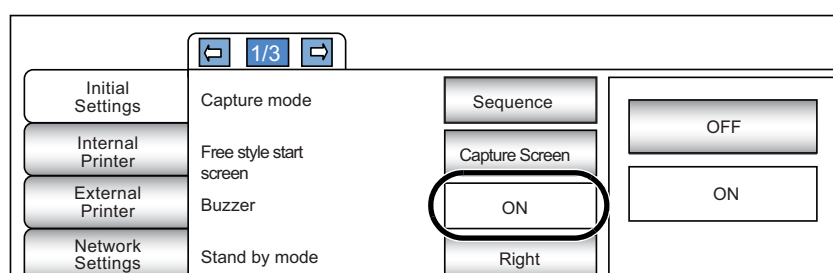
- 1** Tap **INDEX** and select the subject of setting.



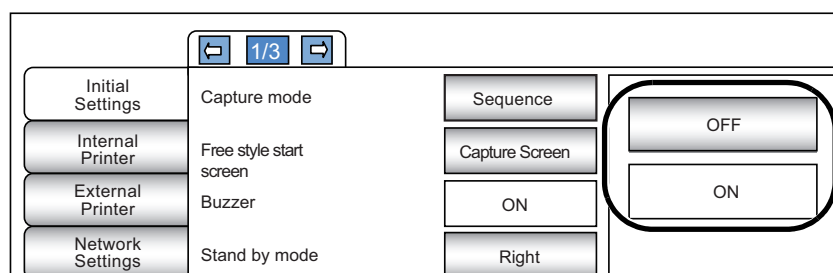
- 2** Operate the **NEXT PAGE** button or **BACK PAGE** button, as necessary, and display the page to confirm/change.



- 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.

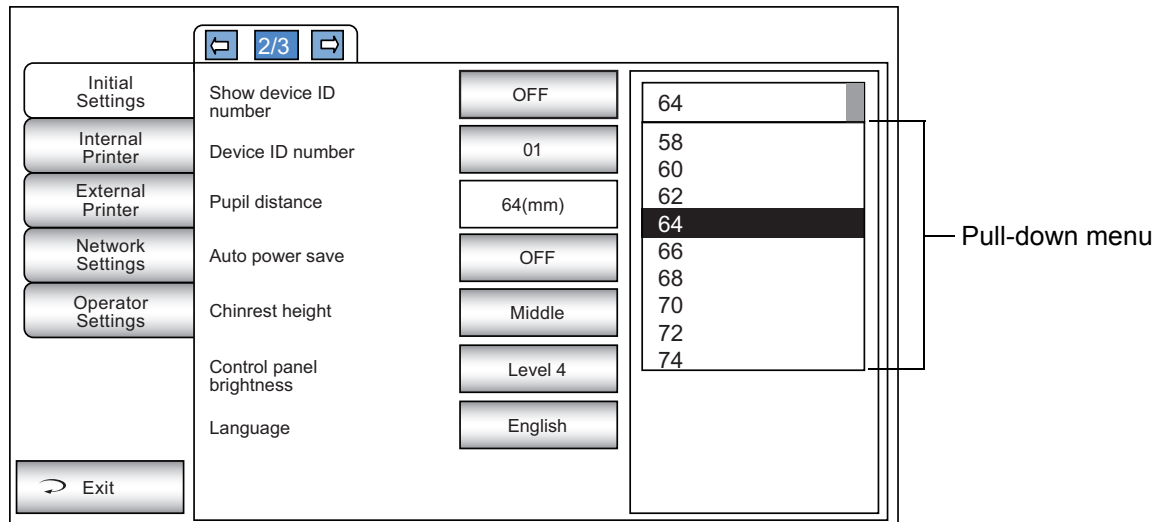


- Instead of the **OPTIONS** button, pull-down menu and ten-key would be displayed.

### PULL-DOWN MENU:

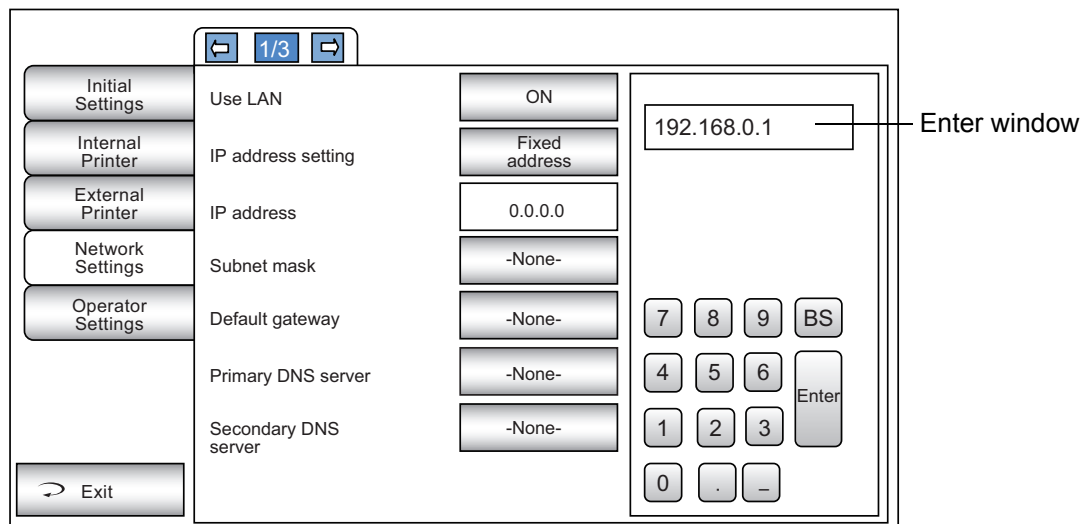
Tap the options button to show a pull-down menu.

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



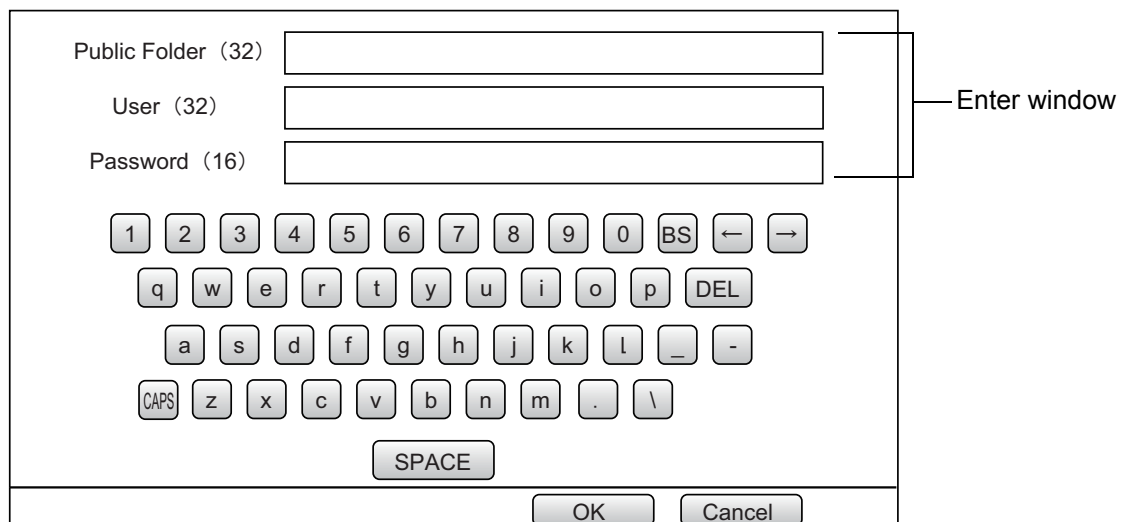
### TEN-KEY:

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.



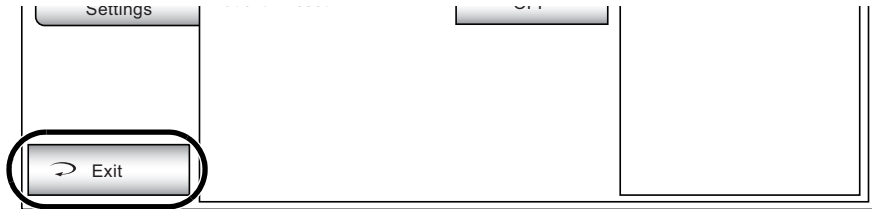


## NOTE

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

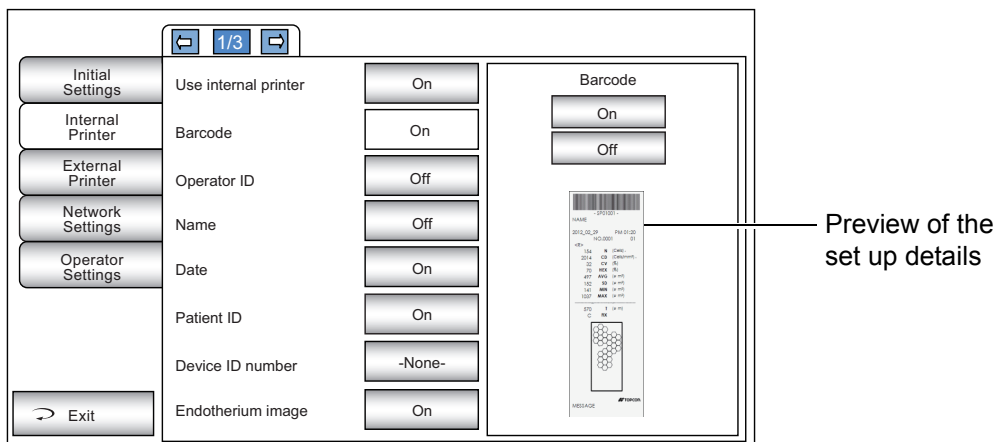
Initial contains settings related to the initial status after power on, clearing all measurement values, etc.

Descriptions	Options	Details	Initial value
Capture mode	Sequence	Operation flow is set as sequence course.	Sequence
	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.	Capture Screen
	Patient Screen	Free style start screen is set to patient screen.	
Buzzer	ON	Buzzer does not sound.	ON
	OFF	Buzzer sounds.	
Stand by mode	Right	Waiting at the initial position for right eye measurement.	Right
	Left	Waiting at the initial position for left eye measurement.	
	Last	Waiting at the last position of the measured eye.	
Patient IDreset	ON	Patient No. is reset upon power on.	OFF
	OFF	Patient No. is not reset upon power on.	
Show device ID number	ON	Device ID is displayed.	OFF
	OFF	Device ID is not displayed.	
Device ID number	1-99 Set by ten-key display.	Sets the Device ID number.	01
Pupil distance	58mm 60mm 62mm 64mm 66mm 68mm 70mm 72mm 74mm Set by pull-down menu	Sets the pupil distance between right and left eyes. (Setting is required when R/L move mode is "Full auto" or "Auto(RL)".)	64mm
Auto power save	OFF	Power save function is not used.	10min
	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.	LOW
	CENTER		
	LOW		
Control panel brightness (Setup of the brightness of control panel)	Level 1 (dark)	The brightness of control panel is set up.	Level 4
	Level 2		
	Level 3		
	Level 4 (bright)		
Language	Japanese	Displayed control panel screen in Japanese.	English
	English	Displayed control panel screen in English.	
Date/Time	Set by ten-key display.	Sets year, month, day, time (24hrs), minute and second	Installation date/time

Descriptions	Options	Details	Initial value
Date format	YMD	Displayed in Year/Month/Day format.	DMY
	MDY	Displayed in Month/Day/Year format.	
	DMY	Displayed in Day/Month/Year format.	
Time format	24h	Displayed in 24-hour	24h
	AM/PM	Displayed in AM and PM	
Packing mode	Execute	Starts packing mode.	–
XZ MOTOR direction	Adjust	The moving direction is changed according to control panel position.	Adjust
	Fixed	The moving direction is not changed according to control panel position.	
Patient ID request	ON	Patient ID is required.	OFF
	OFF	Patient ID is not required.	

## INTERNAL PRINTER

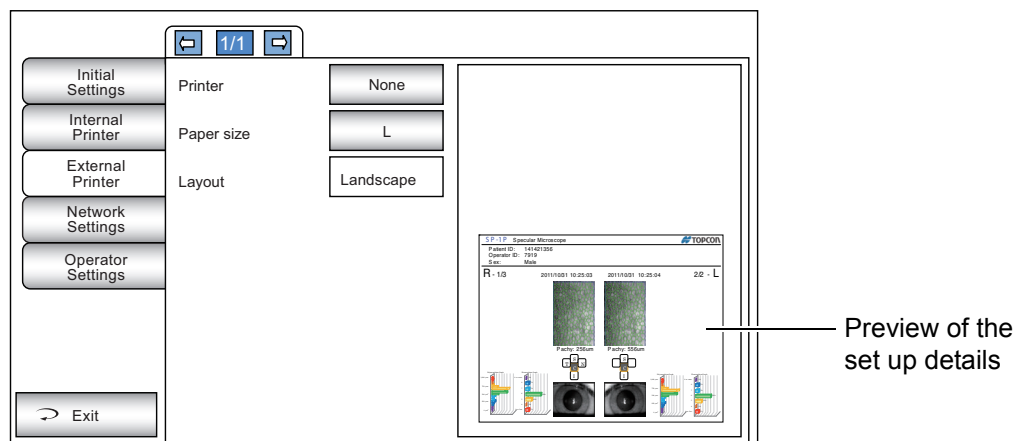
Print contains settings related to output from the internal printer.



Description	Options	Details	Initial value
Use internal printer	ON	Internal printer is used.	ON
	OFF	Internal printer is not used.	
Barcode	ON	Barcode is printed.	OFF
	OFF	Barcode is not printed.	
Operator ID	ON	Operator ID is printed.	OFF
	OFF	Operator ID is not printed.	
Name	ON	"Name" space is available.	OFF
	OFF	"Name" space is not available.	
Date	ON	Date is printed.	ON
	OFF	Date is not printed.	
Patient No.	ON	Patient No. (Patient ID) is printed.	ON
	OFF	Patient No. (Patient ID) is not printed.	
Device ID number	ON	Device ID No. is printed.	ON
	OFF	Device ID No. is not printed.	
Endothelium image	ON	Endothelium image is printed.	ON
	OFF	Endothelium image is not printed.	
Print message	ON	Message is printed.	OFF
	OFF	Message is not printed.	
Message	-None-	String of up to 72 characters.	-None-
	No message		
TOPCON logo	ON	TOPCON logo is printed.	ON
	OFF	TOPCON logo is not printed.	

## EXTERNAL PRINTER

Print contains settings related to output from the external printer.



Description	Options	Details	Initial value
Printer	None	External printer is not used.	None
	CANON CP900	External printer is set to CANON CP900.	
Paper size	L	Paper size is set as L.	L
Layout	Landscape	Paper orientation is set as landscape (horizontal).	Landscape
	Portrait	Paper orientation is set as portrait (vertical).	

## NETWORK SETTINGS

Network contains settings related to data output via LAN.

Description	Options	Details	Initial value
Use LAN	ON	LAN connection is on.	ON
	OFF	LAN connection is off.	
IP address setting	Fixed address	Assign IP address manually.	Fixed address
	DHCP	AUTO Assign IP address automatically.	
IP address	-None-	IP address of PC to output data.	-None-
	IP address		
Subnet mask	-None-	Subnet mask address of SP-1P.	-None-
	IP address		
Default gateway	-None-	Default gateway address of SP-1P.	-None-
	IP address		
Primary DNS server	-None-	Primary DNS Server number.	-None-
	IP address		
Secondary DNS server	-None-	Secondary DNS Server number.	-None-
	IP address		
Use DICOM	ON	Output to DICOM.	OFF
	OFF	Do not Output to DICOM.	
SP-1P port	0-65535 Set by ten-key display.	Port number of using to transmission between SP-1P and DICOM server.	0
SP-1P AE Title	Character string keyboard	AE (Application Entity) name of DICOM transmission.	TOPCON SP1P_01
Worklist server	Server name or IP address (32 characters)	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 Floating keyboard	AE name of work list server. (32 characters)	-None-

Description	Options	Details	Initial value
Storage server	Character string Floating keyboard	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 Floating keyboard	AE name of the storage server.	-None-
Query/Retrieve server	Character string Floating keyboard	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 Floating keyboard	AE name of Query/Retrieve saver (32 characters)	-None-
Transfer syntax	Set by pull-down menu	Selects data encoding method in DICOM.	ImplicitVR
Modality	Set by pull-down menu	Selects a type of modality	SC
MWMFilter-AETitle	ON	AE-title is used for MWM filter.	OFF
	OFF	AE-title is not used for MWM filter.	
MWMFilter-Modality	ON	Modality is used for MWM filter.	OFF
	OFF	Modality is not used for MWM filter.	
Institution Name	Character string Floating keyboard	Sets the institute name.	-None-
Station Name	Character string Floating keyboard	Sets the station name.	-None-
Institutional Department Name	Character string Floating keyboard	Sets the institutional department name.	-None-
Instance Number	Set by ten-key display.	Sets the instance number.	0
Export image	ON	Report image is exported.	OFF
	OFF	Report image is not exported.	
Shared folder setting	None (String 32char)	Path and permission to shared folder is set.	-None-
	Folder name		
	User name		
	Password		
Show network information	-	MAC address is shown.	-

Initial Settings

Internal Printer

External Printer

Network Settings

Operator Settings

Exit

1/3

Use LAN

IP address setting

IP address

Subnet mask

Default gateway

Primary DNS server

Secondary DNS server

ON

Fixed address

0.0.0.0

-None-

-None-

-None-

-None-

-None-

ON

OFF

## OPERATOR SETTINGS

OPERATOR contains settings related to Operator ID.

Description	Options	Details	Initial value
Use of operator ID	ON	Operator ID will not be displayed on the control panel and output.	OFF
	OFF	Operator ID will 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.	None
Operator ID request	ON	Operator ID is required.	OFF
	OFF	Operator ID is not required.	
Fixed operator ID	ON	Operator ID is fixed.	OFF
	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

# TROUBLESHOOTING

## TROUBLE-SHOOTING OPERATIONS

### MESSAGE LIST

"ERROR"	Displayed when the photographing is an error.
"Close printer cover"	The printer cover is open. Close the cover until it clicks.
"Paper end"	Printer paper is used up. Supply printer paper.
"Fatal Error!"	Displayed when the printer unit does not operate normally, such as the cutter does not work. Call the serviceman.
"Patient ID is required. Please set patient ID."	Displayed when the output operation is requested 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 requested when the setting "Operator ID request" is ON but the operator ID is not inputted. Enter the operator ID and then request the output operation.
"LAN hostname error"	Failed to resolve the host name of the destination (to be connected with the shared folder). Confirm the inputted host name or DNS server address.
"LAN mount error"	Failed to connect to the shared folder. Confirm the address, folder name, user name and password of the destination (to be connected with the share folder).
"LAN create Error"	Failed in file creation. Confirm that write permission to the share folder is set correctly.
"LAN write Error"	Failed in writing to the file. Check the free space capacity at the save location.
"LAN stop error"	Failed to reset the LAN connection. Confirm that the LAN cable connection and the LAN setting are in the correct way.
"LAN restruct error"	Failed to reset the LAN connection. Confirm that the LAN cable connection and the LAN setting are in the correct way.
"Failed to get IP address."	Failed in IP address auto assignment. Set a fixed IP address, or check if the DHCP server is running.
"Unknown Error"	Displayed in case of a LAN error other than the LAN errors mentioned previously.
"IP address conflict"	Displayed when the IP address is duplicated.
"Previous photographing data are left. Please press the Clear button."	Displayed when the output of all output-set data fails.
"Output not set"	Displayed when all output settings are OFF.
"Check eyelid"	Displayed when the patient's eyelid covers the pupil. Tell the patient to open their eye as wide as possible.
"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.
"TOO CLOSE"	Warns that the measuring head is too close to the patient's eye.
"TOO FAR"	Warns that the measuring head is too far from the patient's eye.
"Please check the DATE/TIME"	The battery for the built-in clock become run down. <ul style="list-style-type: none"><li>• Before using, confirm the time and date on the SETUP menu.</li><li>• If the message comes up frequently, call your service engineer.</li></ul>
"Chinrest Error"	Displayed when the chinrest is not correctly connected or not connected at all.

"Turn off the unit?"	Displayed to confirm whether to move the chinrest and measuring head to their last positions.
"Please wait until packing mode is finished..."	Indicates that the packing operation is in process. Wait until it is completed.
"Packing mode is finished. Please turn off the device."	Indicates that the packing operation is completed. Switch off the machine.
"First Octet is 1 - 223 Range"	Displayed when the first octet of IP address, default gateway, primary DNS server or secondary DNS server is set to a value out of the specified input range.
"Value is irregular. Input valid value"	Displayed when the octet is set to a value out of the specified input range. Enter a value within the input range.
"The IP address is 0 - 255 Range"	Displayed when the subnet mask is set to a value off the input rule. Enter a value within the input rule.
"At least 3 characters are required for operator ID prefix."	Displayed when the input examiner ID prefix is less than 3 characters. Enter a prefix with 3 characters.
"Incorrect password"	Displayed when the password inputted to select a special mode is incorrect.
"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.

## TROUBLE-SHOOTING OPERATIONS



### WARNING

To avoid electrical shock, do not open the instrument.  
All service should be performed by a qualified service engineer.

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?	28
		Is power cable connected to the instrument?	28
Control panel is not clear.	The image is dark.	Adjust the brightness by "Control panel Brightness Adjust".	59
Any trouble is found in a movable part.	_____	Do not move it forcibly but call our service engineer.	89
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.	31
	Paper does not come out.	If "PAPER END" displayed on control panel, replenish printer paper.	31



# SPECIFICATIONS AND PERFORMANCE

## 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 $\pm 0.010$ mm Over 0.600mm within $\pm 0.025$ mm • Corneal thickness is measured only when taking a photograph using the central fixation target.



### NOTE

#### Essential performance

- Measurement must be performed correctly.
- Monitor screen display must not be distorted.

# 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)  
Atmospheric pressure: 700hPa to 1060hPa

## **STORAGE, USAGE PERIOD**

### 1. Environmental conditions (without package)

\*Temperature : 10°C to 40°C

Humidity : 10% to 95% (without condensation)

Air 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 air 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%

## **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%

## **ELECTRIC RATING**

Source voltage: 100-240V AC, 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 82.

## **DISPOSAL**

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

 <b>NOTE</b>	 <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><b>[WARNING]</b> This Product Contains Mercury in the backlighting of the LCD display. Prior to disposal remove or otherwise ensure that this is disposed of in accordance with Local, State and Federal Laws. This information is applicable in U.S.A only.</p>
	<p>This product contains a CRL Lithium Battery which contains Perchlorate Material-special handling may apply. See <a href="http://www.dtsc.ca.gov/hazardouswaste/perchlorate/">http://www.dtsc.ca.gov/hazardouswaste/perchlorate/</a> Note; This is applicable to California, U.S.A. only</p>

## **ELECTROMAGNETIC COMPATIBILITY**


The product conforms to the EMC standard (IEC 60601-1-2 Ed3.0:2007)

- 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 the EQUIPMENT or SYSTEM.

Item	Article code	Cable Shielded	Ferrite Core	Length (m)
AC power cord for (AC120V)	44804 7015	NO	NO	1.4
AC power cord for (AC120V)	44804 7017	NO	NO	1.4
AC power cord for (AC230V)	44804 2090	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

<b>Guidance and manufacturer's declaration - electromagnetic emissions</b>		
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.		
<b>Emissions test</b>	<b>Compliance</b>	<b>Electromagnetic environment - guidance</b>
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 other than 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 IEC61000-3-2	Complies	
Voltage fluctuations/ flicker emissions IEC61000-3-3	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	IEC 60601 test level	Compliance level	Electromagnetic environment - guidance
Electrostatic discharge(ESD) IEC 61000-4-2	± 6 kV contact ± 8 kV air	± 6 kV contact ± 8 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	± 2 kV for power supply lines ± 1 kV for input/output lines	Mains 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	Mains 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	<5% $U_t$ (>95% dip in $U_t$ ) for 0, 5 cycle 40% $U_t$ (60% dip in $U_t$ ) for 5 cycles 70% $U_t$ (30% dip in $U_t$ ) for 25 cycles <5% $U_t$ (>95% dip in $U_t$ ) for 5 sec.	<5% $U_t$ (>95% dip in $U_t$ ) for 0, 5 cycle 40% $U_t$ (60% dip in $U_t$ ) for 5 cycles 70% $U_t$ (30% dip in $U_t$ ) for 25 cycles <5% $U_t$ (>95% dip in $U_t$ ) for 5 sec.	Mains power quality should be that of a typical commercial or hospital environment. If the user or the SP-1P requires continued operation during power mains 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	3 A/m	3 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. mains voltage prior to application of the test level.			

Guidance and manufacturer's declaration - electromagnetic immunity			
<p>The SP-1P is intended for use in the electromagnetic environment specified below.</p> <p>The customer or the user of the SP-1P should assure that it is used in such an environment.</p>			
Immunity test	IEC 60601 test level	Compliance level	Electromagnetic environment - guidance
<p>Conducted RF IEC 61000-4-6</p> <p>Radiated RF IEC 61000-4-3</p>	<p>3 Vrms 150kHz to 80MHz</p> <p>3 V/m 80MHz to 2, 5GHz</p>	<p>3 V</p> <p>3 V/m</p>	<p>Portable and mobile RF communications equipment 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.</p> <p>Recommended separation distance</p> $d = 1.2 \sqrt{P}$ $d = 1.2 \sqrt{P} \quad 80\text{MHz to } 800\text{MHz}$ $d = 2.3 \sqrt{P} \quad 800\text{MHz to } 2, 5\text{GHz}$ <p>where <math>P</math> is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer and <math>d</math> is the recommended separation distance in meters (m).</p> <p>Field strengths from fixed RF transmitters, as determined by an electromagnetic site survey, <sup>a</sup> should be less than the compliance level in each frequency range. <sup>b</sup></p> <p>Interference may occur in the vicinity of equipment marked with the following symbol:</p> 
<p>NOTE 1 At 80 MHz and 800 MHz, the higher frequency range applies.</p> <p>NOTE 2 These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.</p>			
<p>a Field strengths from fixed transmitters, such as base stations for radio (cellular/cordless) telephones and land mobile radios, amateur radio, AM and FM radio broadcast and TV broadcast cannot be predicted theoretically with accuracy. To assess the electromagnetic environment due to fixed RF transmitters, an electromagnetic site survey should be considered. If the measured field strength in the location in which the SP-1P is used exceeds the applicable RF compliance level above, the SP-1P should be observed to verify normal operation. If abnormal performance is observed, additional measures may be necessary, such as reorienting or relocating the SP-1P.</p> <p>b Over the frequency range 150 kHz to 80 MHz, field strengths should be less than 3 V/m.</p>			



Recommended separation distance between portable and mobile RF communications equipment and the SP-1P			
The SP-1P is intended for use in an electromagnetic environment in which radiated RF disturbances are controlled. The customer or the user of the SP-1P can help prevent electromagnetic interference by maintaining a minimum distance between portable and mobile RF communications equipment (transmitters) and the SP-1P as recommended below, according to the maximum output power of the communications equipment.			
Rated maximum output power of transmitter W	Separation distance according to frequency of transmitter m		
	150kHz to 80MHz $d = 1.2 \sqrt{P}$	80MHz to 800MHz $d = 1.2 \sqrt{P}$	800MHz to 2,5GHz $d = 2.3 \sqrt{P}$
0, 01	0, 12	0, 12	0, 23
0, 1	0, 38	0, 38	0, 73
1	1.2	1.2	2.3
10	3.8	3.8	7.3
100	12	12	23
For transmitters rated at a maximum output power not listed above, the recommended separation distance $d$ in metres (m) can be estimated using the equation applicable to the frequency of the transmitter, where $P$ is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer.			
NOTE 1 At 80 MHz and 800 MHz, the separation distance for the higher frequency range applies.			
NOTE 2 These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.			

## 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 60950-1 for data processing equipment and IEC 60601-1 for medical equipment).

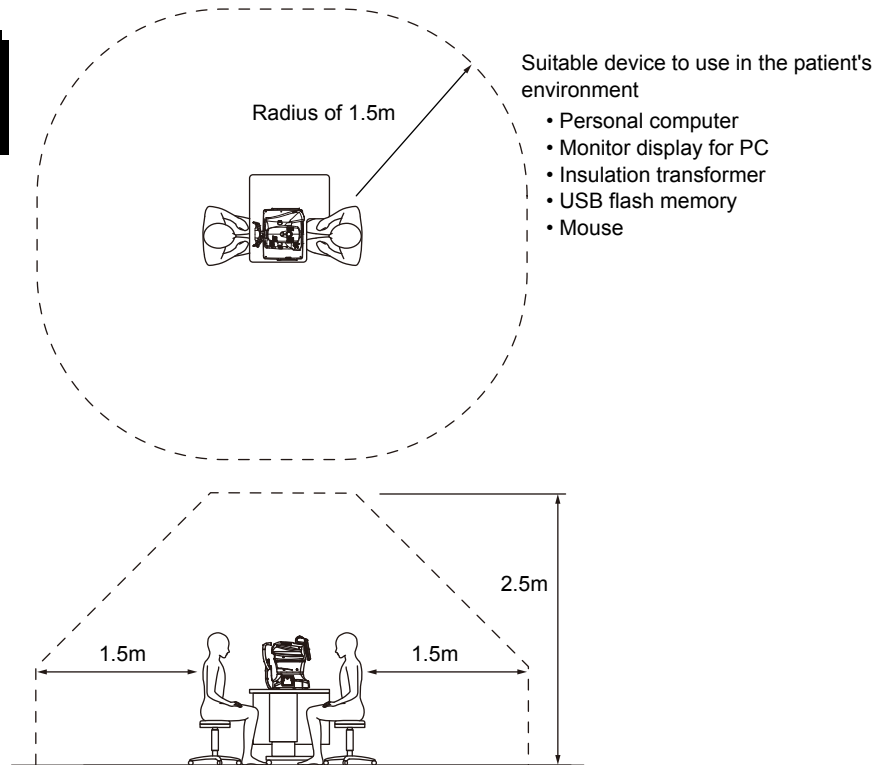
Anybody connecting additional equipment to medical electrical equipment configures a medical system and is therefore responsible that the system complies with the requirements for medical electrical systems. Attention is drawn to the fact that local laws take priority over the above mentioned requirements.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

## **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 IEC60601-1. If you are compelled to use any device not conforming to IEC60601-1, use an insulation transformer or the common protective earth system.

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



Note 1: Use the personal computer conforming to IEC60950-1.

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

Note 3: Use the insulation transformer conforming to IEC60601-1.



### **CAUTION**

- Don't connect an additional power strip or an extension cord to the system.
- Don't connect any device which is not recognized as one component of 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

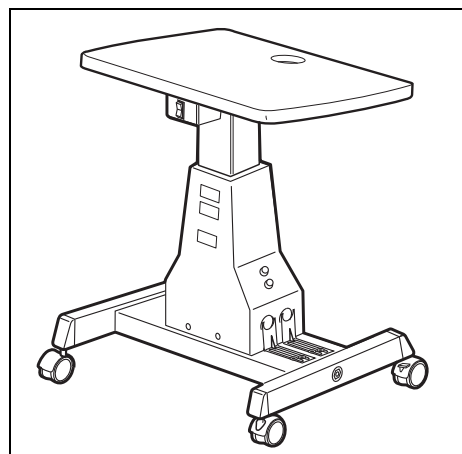
## OPTIONAL ACCESSORIES

- Adjustable instrument table AIT-16

The table height can be adjusted to facilitate measurement.

### Specifications

- Dimensions.....525(W)x490(D)mm
- Table height.....660~880mm
- Table size .....490x500mm
- Weight .....approx. 23kg
- Power consumption..... 150VA (100-120V, 220-240V)



## SHAPE OF PLUG

Country	Voltage/frequency	Shape 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
USA	120V/60Hz	Type A (Hospital Grade)
Canada	120V/60Hz	Type A (Hospital Grade)

# 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 82 "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 59).

## 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

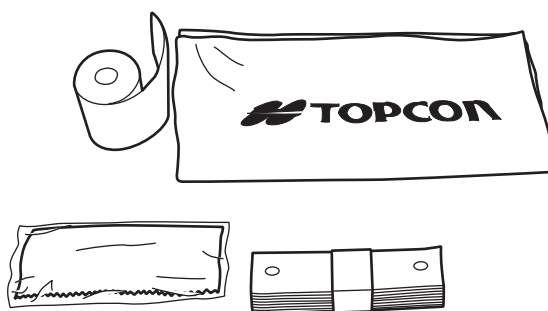
When using the dust cover, tap the Reset button and return the chinrest and measuring head to their initial positions.

### 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	40310 4082
Silicon cloth	44800 1001
Dust cover	42360 9002

Product name	Product code
Printer paper	44800 4001



## USER MAINTENANCE ITEM

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

## MANUFACTURER MAINTENANCE ITEMS

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

## PRINTER PAPER JAM



### CAUTION

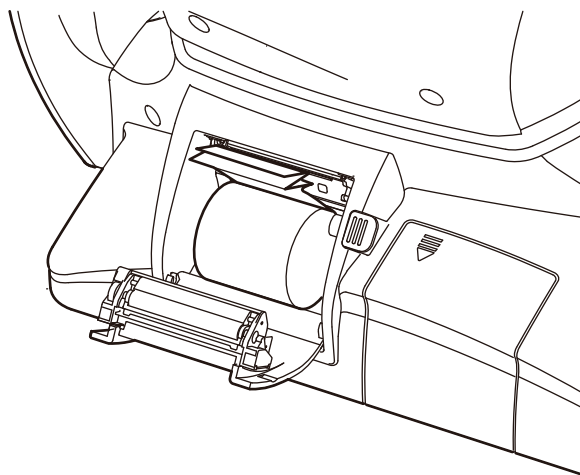
- To avoid failure or potential injury, do not open the printer cover while the printer is in operation.
- To avoid potential injury in case of malfunction, including a paper jam, be sure to shut off the power before attempting to repair it.
- To avoid potential injury, do not touch the printer body including metal parts or the paper cutter, while the printer is in operation or when replacing the printer paper.
- Pay much attention not to touch the internal printer's body when the cover is open. If touched, it may result in trouble due to electrostatic discharge.



### 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.

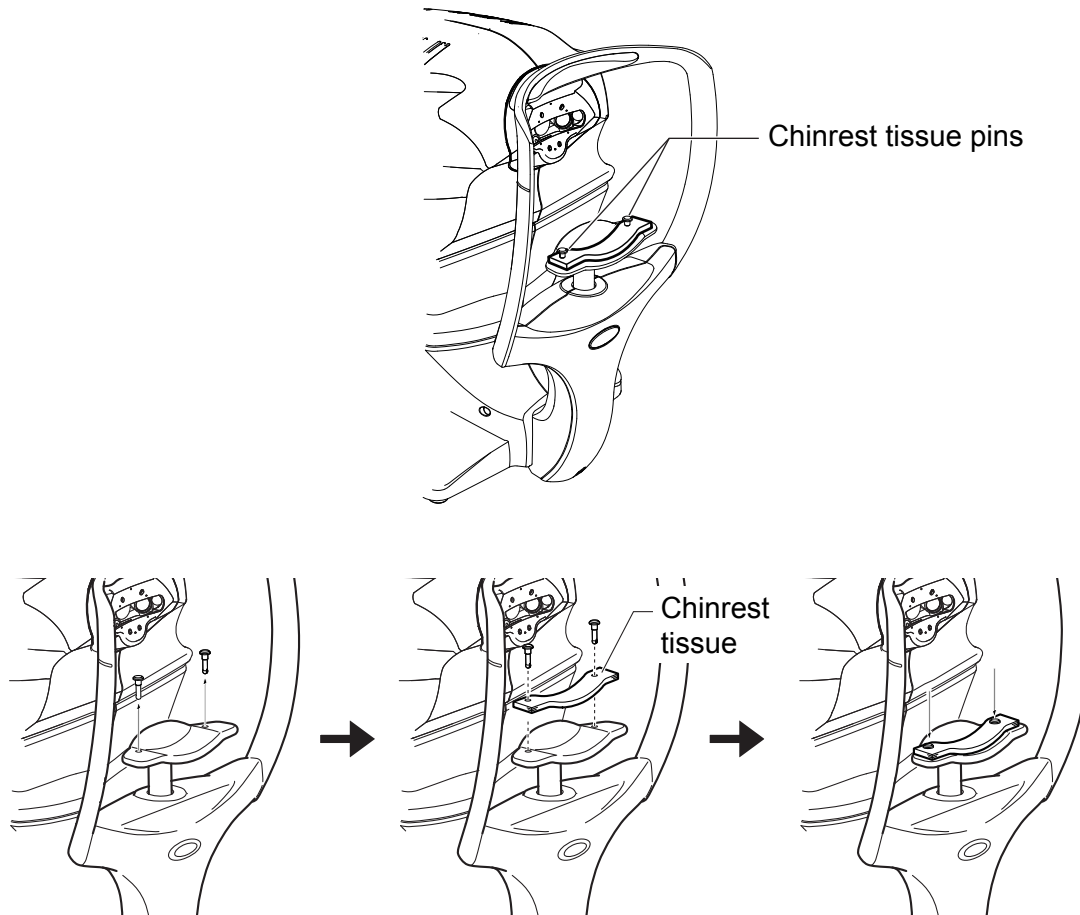


### NOTE

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

- 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.

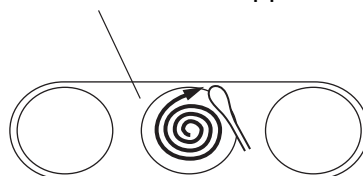
**1** Prepare a lens cleaner.

**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.

 <b>NOTE</b>	<ul style="list-style-type: none"><li>• Don't wipe the photographing window using a commercial tissue, etc. This may make the photographing window dirtier.</li><li>• Don't wipe the photographing window using gauze held with tweezers. This may damage the surface of the lens or glass.</li><li>• Replace new applicator and repeat cleaning.</li></ul>
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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

 <b>NOTE</b>	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

 <b>NOTE</b>	<ul style="list-style-type: none"><li>• 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.</li><li>• 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.</li></ul>
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### 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.

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Please specify the following when contacting us regarding questions about this operation microscope.

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- 

SPECULAR MICROSCOPE SP-1P

USER MANUAL

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