



Non-Contact Tonometer (ETN-1800)
User Manual

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1. Introduction

1.1 Outline

ETN-1800 is a non-contact tonometer that measures IOP by delivering a soft air puff without eye contact. The cornea applanation detection scheme is constructed by sensing light that is reflected from the corneal surface and records a maximal signal at the instant of applanation. The applanation monitoring system continuously monitors the status of corneal curvature during the measurement event. The LED directs a collimated beam of light at the corneal vertex while the detector looking at the same area. When the applanation is achieved, the cornea acts like a planar mirror and causes a maximal signal detected by the detector at applanation of the cornea.

1.2 Intended Use

ETN-1800 is a non-contact tonometer that is intended to measure the intraocular pressure of human eye in vivo.

1.3 Features

ETN-1800 tonometer has following features

- Fully automatic system –
It is no need to manipulate the joystick. Just touch the button on the screen and then the machine can track the eye center, puff the air and calculate the IOP automatically.
- Automatic air puff control system –
The built-in intelligent software provides softer and quieter air puff which makes patient feel comfortable.
- Integral type with motorized up-and-down chinrest –
Both the measuring head and chinrest are mounted on the base of ETN-1800. The motorized chinrest allows operator to decide the



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position of patient's head by adjusting the height of the chinrest.


1.4 Proper Instrument Use

1. ETN-1800 is a medical device; it must be operated by properly trained and qualified person(s) only. The operation should be supervised by a physician.
2. Please be sure to read the user manual to understand the safety precautions before operating this device.
3. Always enter patient information first.
4. Prepare patient contact surfaces (forehead rest and chinrest) according to the cleaning method in this manual.
5. Instantly turn off the power switch of this instrument and disconnect the power cable if uncertain problems arise.

2. Safety Information







Displays for Safety Use

<u>Display</u>	<u>Meaning</u>
 WARNING	"WARNING" indicates the presence of a hazard that could result in severe personal injury.
 CAUTION	"CAUTION" indicates the presence of a hazard that could result in minor injury.
NOTE	"NOTE" provides useful information for operation of which is important.

 WARNING	<p>Do not measure a patient with the following conditions</p> <ul style="list-style-type: none"> - Subjects with only one functional eye - Those with one eye having poor or eccentric fixation - Subjects with scarring or who have had corneal surgery, including corneal laser surgery
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		<ul style="list-style-type: none"> - Microphthalmos - Buphthalmos - Dry eye - Lid squeezers – blepharospasm - Nystagmus - Keratoconus - Any other corneal or conjunctival pathology or infection - High corneal astigmatism (> 3D)
	WARNING	Do not measure a patient wearing contact lens.
	WARNING	To avoid risk of electric shock, this equipment must only be connected to the supply mains with protective earth.
	WARNING	The patient cannot touch any electrical device that is not powered by ETN-1800 with any part of his or her body while being examined. In addition, ETN-1800 operator must not attempt to touch the patient and any electrical device that is not powered by ETN-1800 at the same time while examining the patient. Failure to do so could result in electrical shock to the patient and/or operator.
	WARNING	Do not modify this equipment without authorization of the manufacturer.
	WARNING	Do not connect the instrument with anything other than specified. Otherwise, it may result in fire or electric shock. For details of purchasing accessories, please contact a Ezer representative or distributor.
	WARNING	ETN-1800 is not intended for home use and may not be stored or operated in environmental conditions other than those prescribed. (see <i>Specification</i>)





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	WARNING	Do not obstruct the mains power switch or position the equipment where the connection to the mains line can be accidentally disconnected.
	WARNING	Equipment is not suitable for use in the presence of a Flammable Anesthetic Mixture with Air, Oxygen, or Nitrous Oxide.
	WARNING	Do not touch the cutter of the printer. Otherwise it may result injury
	WARNING	The column of the chinrest module is not an applied part and sensitive, please do not touch the column unless for engineering affairs.
	CAUTION	Be sure to hold the bottom of the base when ETN-1800 is moved.
	CAUTION	Do not use or apply any aerosol-type cleaner in air nozzle. If any drop of cleaner remains inside the air nozzle, the patient's eye may be damaged during measurement.
	CAUTION	Check if there is no dust on the air nozzle before use.
	CAUTION	Do not operate the LCD monitor with wet hands or hard objects. The LCD monitor may be damaged.
	CAUTION	Be sure to shut off the power before attempting to repair printer paper.
	CAUTION	When adjusting chinrest, be careful not to pinch the patient's hand.
	CAUTION	The device needs to be installed on the stable table. Do not install in location that is unstable or exposed to vibration.










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 CAUTION	<p>The max. measurement time of the same patient cannot be more than 20 minutes.</p>
 CAUTION	<p>Make sure to keep safety distance before each measurement. Look from the side of the patient when setting the stop position to keep the safety distance.</p>
Note	<p>“Fully automatic mode” means that the device will switch to another eye to do measurement automatically after finish the first eye measurement.</p>
Note	<p>“Automatic mode” means that the device will only measure one eye automatically.</p>
Note	<p>“Manual mode” means that the operator needs to press the buttons on the touch panel to move the device in X/Y/Z directions to track the eye center and then puff air to the eye.</p>
Note	<p>Instruct the patient to look at the green light (internal fixation target) before start to measure.</p>



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Symbols and Labels









	<p>Presence of electrical shock hazard. Note: Indicates risk of electrical shock due to the presence of uninsulated high voltage inside the instrument. Do not remove the instrument cover or parts.</p>
	<p>Circuit Breaker</p>
	<p>Type B applied parts. Note: This instrument complies with the specified requirements to provide protection against electrical shock, particularly regarding allowable patient leakage current.</p>
	<p>Manufacturer Crystalvue Medical Corporation No. 116, Ln. 956, Zhongshan Rd., Taoyuan Dist., Taoyuan City 33072, Taiwan</p>
	<p>Serial number</p>
	<p>Catalog number / part number</p>
	<p>Prescription Use</p>



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Protective Packing Symbols

The protective packing symbols specify the handling requirements and the transportation and storage conditions.


	Fragile, Handle with care
	Keep Dry
	Keep this end upwards
	Relative Humidity
	Temperature
	Do not stack
	2 Layers only
	<p>Waste Electrical and Electronic Equipment (WEEE) Recycling Instructions</p> <p>When determined that the device is ready for disposal, it is to be recycled following the policies and procedures reflecting respective country's requirements. Do not dispose of device as general waste</p>



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Product Compliance

ETN-1800 is classified as follows:

- **Class I Equipment** – Protection against electrical shock.
-  **Type B** – Degree of protection against electric shock of applied part (chinrest and forehead rest).
- **Ordinary Equipment (IPX0)** – Degree of protection against ingress of liquids (none).
- **Continuous Operation** – Mode of operation
- **Electromagnetic Compatibility (EMC): EN 60601-1-2:2007**

ETN-1800 has been tested to comply with the emission and Immunity requirements of EN60601-1-2:2007. ETN-1800 is intended for use in an electromagnetic environment where radiated RF disturbances are not beyond the standard defined in EN60601-1-2:2007.

Certification: under IEC 60601-1

Guidance and manufacturer’s declaration – electromagnetic emissions		
ETN-1800 is intended for use in the electromagnetic environment specified below. The customer or the user of ETN-1800 should assure that it is used in such an environment.		
Emissions test	Compliance	Electromagnetic environment – guidance
RF emissions CISPR 11	Group 1	ETN-1800 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.
RF emissions CISPR 11	Class A	ETN-1800 is suitable for use in all establishments, including domestic establishments and those directly connected to the public low-voltage power supply network that
Harmonic emissions IEC 61000-3-2	Class A	



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Voltage fluctuations/ flicker emissions IEC 61000-3-3	Complies	supplies buildings used for domestic purposes.	
Guidance and manufacturer's declaration – electromagnetic immunity			
ETN-1800 is intended for use in the electromagnetic environment specified below. The customer or the user of ETN-1800 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.
interruptions and voltage variations on power supply input lines	<5 % <i>UT</i> (>95 % dip in <i>UT</i>) for 0,5 cycle	<5 % <i>UT</i> (>95 % dip in <i>UT</i>) for 0,5 cycle	Mains power quality should be that of a typical commercial or hospital environment. If the user of ETN-1800 requires continued operation during power mains interruptions, it is recommended



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IEC 61000-4-11	<p>40 % <i>UT</i> (60 % dip in <i>UT</i>) for 5 cycles</p> <p>70 % <i>UT</i> (30 % dip in <i>UT</i>) for 25 cycles</p> <p><5 % <i>UT</i> (>95 % dip in <i>UT</i>) for 5 sec</p>	<p>40 % <i>UT</i> (60 % dip in <i>UT</i>) for 5 cycles</p> <p>70 % <i>UT</i> (30 % dip in <i>UT</i>) for 25 cycles</p> <p><5 % <i>UT</i> (>95 % dip in <i>UT</i>) for 5 sec</p>	that ETN-1800 be powered from an uninterruptible power supply or a battery.
<p>Power frequency (50/60 Hz) magnetic field IEC 61000-4-8</p>	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: <i>UT</i> is the a.c. mains voltage prior to application of the test level.			




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Guidance and manufacturer's declaration – electromagnetic immunity			
ETN-1800 is intended for use in the electromagnetic environment specified below. The customer or the user of ETN-1800 should assure that it is used in such an environment.			
Immunity test	IEC 60601 test level	Compliance level	Electromagnetic environment – guidance
Conducted RF IEC 61000-4-6	3 Vrms 150 kHz to 80 MHz	3 Vrms	Portable and mobile RF communications equipment should be used no closer to any part of ETN-1800, including cables, than the recommended separation distance calculated from the equation applicable to the frequency of the transmitter. Recommended separation distance $d = 1,2 \sqrt{P}$
Radiated RF IEC 61000-4-3	3 V/m 80 MHz to 2,5 GHz	3 V/m	$d = 1,2 \sqrt{P}$ 80 MHz to 800 MHz $d = 2,3 \sqrt{P}$ 800 MHz to 2,5 GHz where P is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer and d is the recommended separation distance in meters (m). Field strengths from fixed RF transmitters, as determined by an electromagnetic site survey, a should be less than the compliance level in each frequency range.b



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			<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>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 ETN-1800 is used exceeds the applicable RF compliance level above, ETN-1800 should be observed to verify normal operation. If abnormal performance is observed, additional measures may be necessary, such as reorienting or relocating ETN-1800.</p> <p>Over the frequency range 150 kHz to 80 MHz, field strengths should be less than 3 V/m.</p>			



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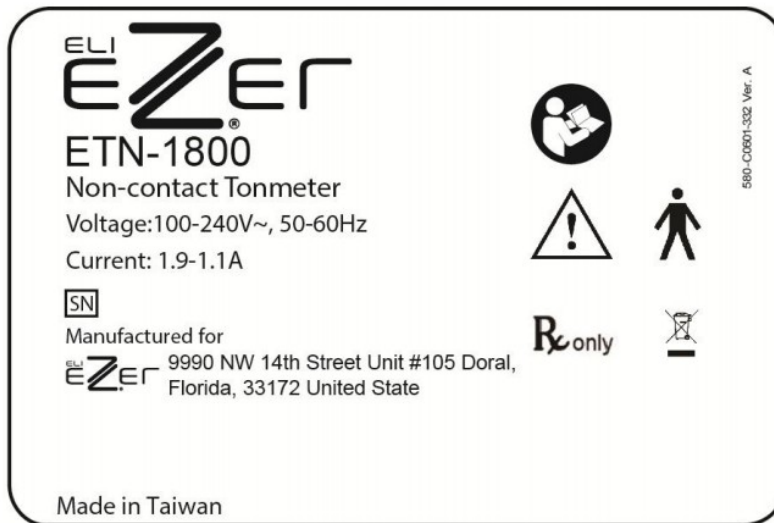
Recommended separation distances between portable and mobile RF communications equipment and ETN-1800			
<p>ETN-1800 is intended for use in an electromagnetic environment in which radiated RF disturbances are controlled. The customer or the user of ETN-1800 can help prevent electromagnetic interference by maintaining a minimum distance between portable and mobile RF communications equipment (transmitters) and ETN-1800 as recommended below, according to the maximum output power of the communications equipment.</p>			
Rated maximum output power of transmitter W	Separation distance according to frequency of transmitter m		
	150 kHz to 80 MHz $d = 1,2 \sqrt{P}$	80 MHz to 800 MHz $d = 1,2 \sqrt{P}$	800 MHz to 2,5 GHz $d = 2,3 \sqrt{P}$
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
<p>For transmitters rated at a maximum output power not listed above, the recommended separation distance d in meters (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.</p> <p>NOTE 1 At 80 MHz and 800 MHz, the separation distance for 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>			



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Product Labels

ETN-1800 system labels (Sample Only):



WARNING: Do not connect the instrument with anything other than specified. Otherwise, it may result in fire or electric shock. For details of purchasing accessories, please contact Ezer representative or distributor.

Service Life

The service life of ETN-1800 is five years if specified inspections and maintenance are done.



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3. Components

3.1 Instrument Description





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3.2 Standard Accessories

Item	Description	Q'ty
1	User Manual	1 pc.
2	AC Power Cord	1 pc.
3	Dust Cover	1 pc.
4	Printer Paper	1 roll



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4. Basic Operations

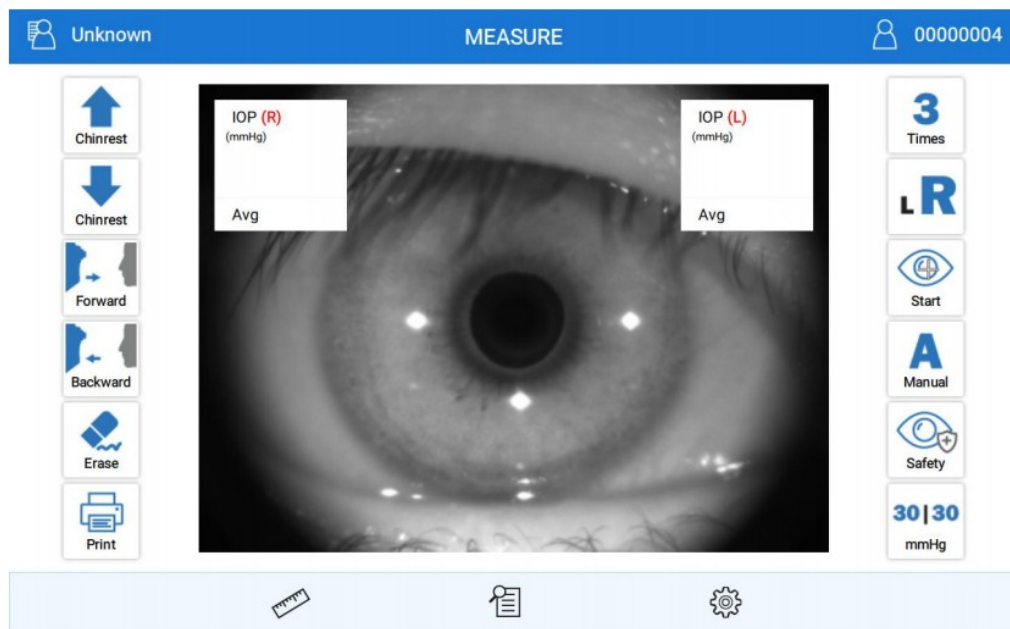
4.1 Before Measurement

4.1.1 Power On

Step1. Make sure the power cable is connected.

Step2. Turn on the power switch.

Step3. The following screen picture is shown after safety check.

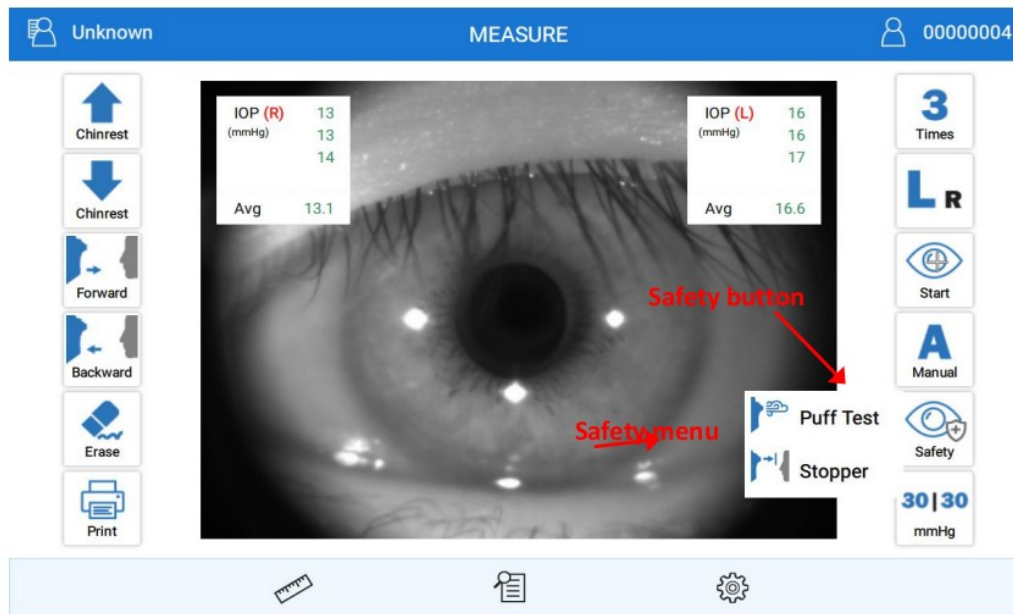




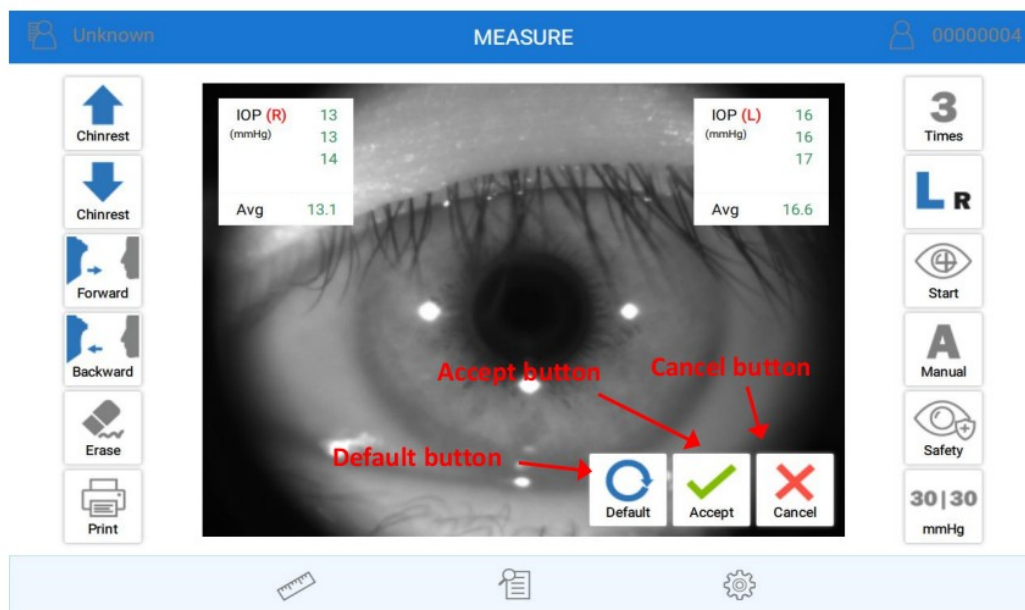
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4.1.2 Set Stopper

Step1. Tap the Safety button. The safety menu is displayed.



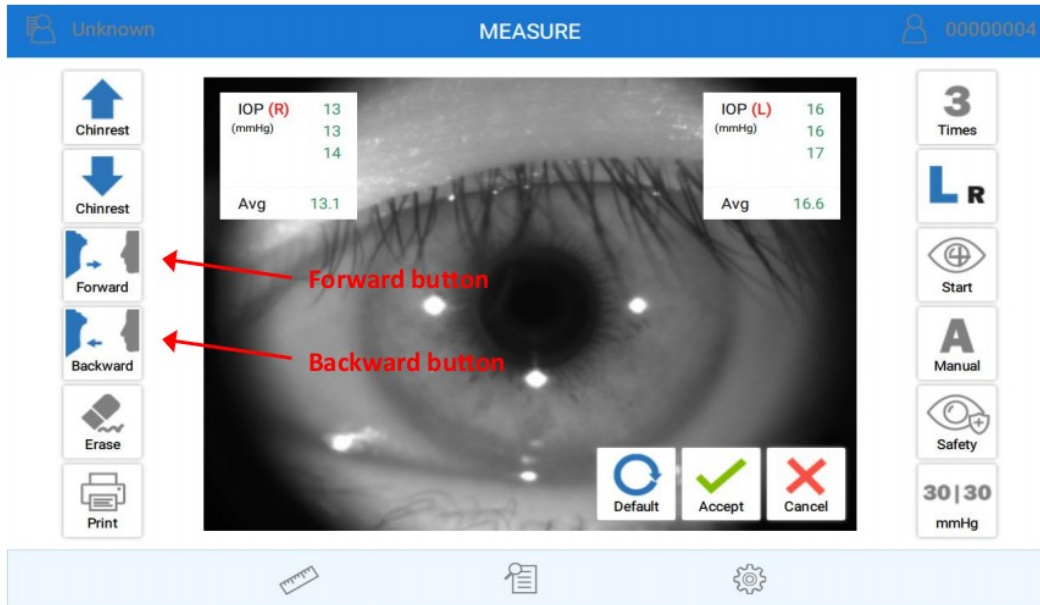
Step2. Tap the Stopper button. The Default, Accept and Cancel buttons are displayed.





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Step3. Tap the Forward/Backward buttons to adjust the measuring head.



Step4. Tap Default, Accept or Cancel to set the Z-axis limitation for measuring head.

NOTE:

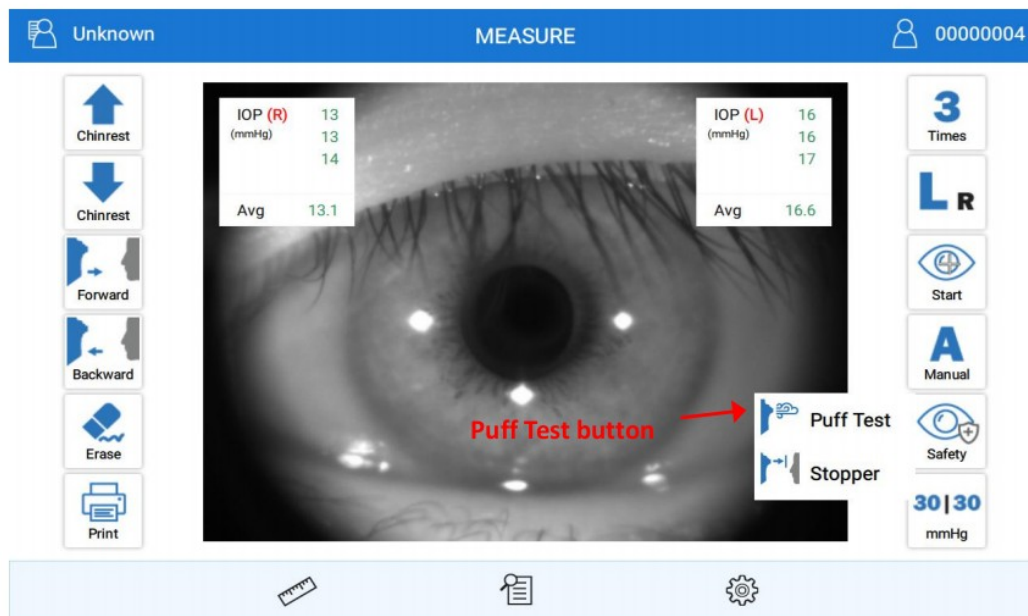
- 1). **“Default”** means that the stopper setting function is disabled.
“Accept” means that current measuring head position will be set as stopper position.
“Cancel” means to leave this stopper setting page.
- 2). While watching from one side of the device, tap the Accept button when the distance between puff nozzle and patient's eye becomes 8 to 10mm.



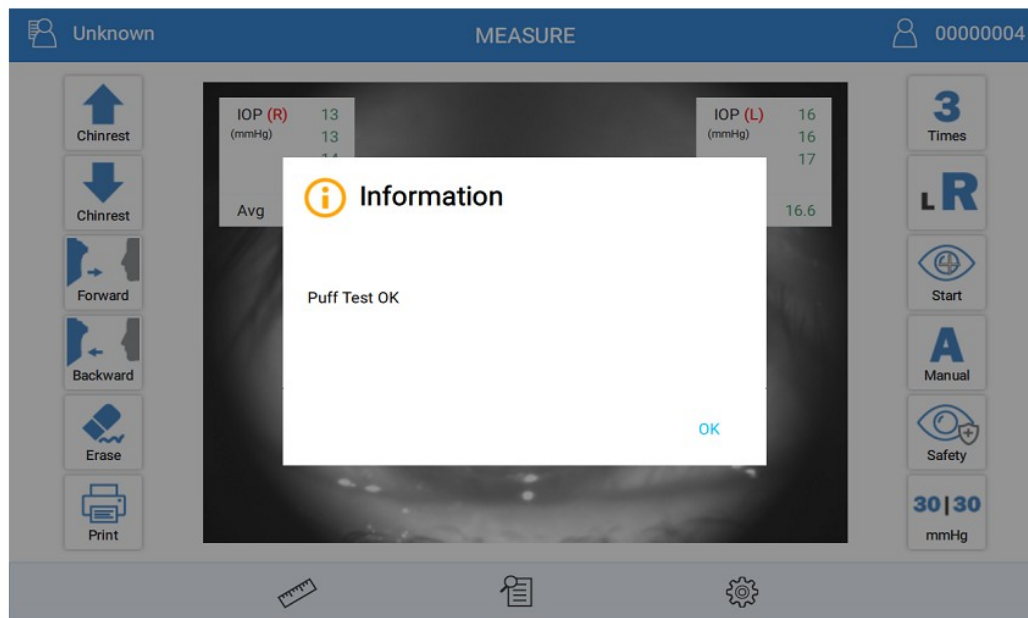
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4.1.3 Check Nozzle

Step1. Tap the Safety button. The safety menu is displayed.



Step2. Tap the Puff Test button. The test result is displayed on the screen.

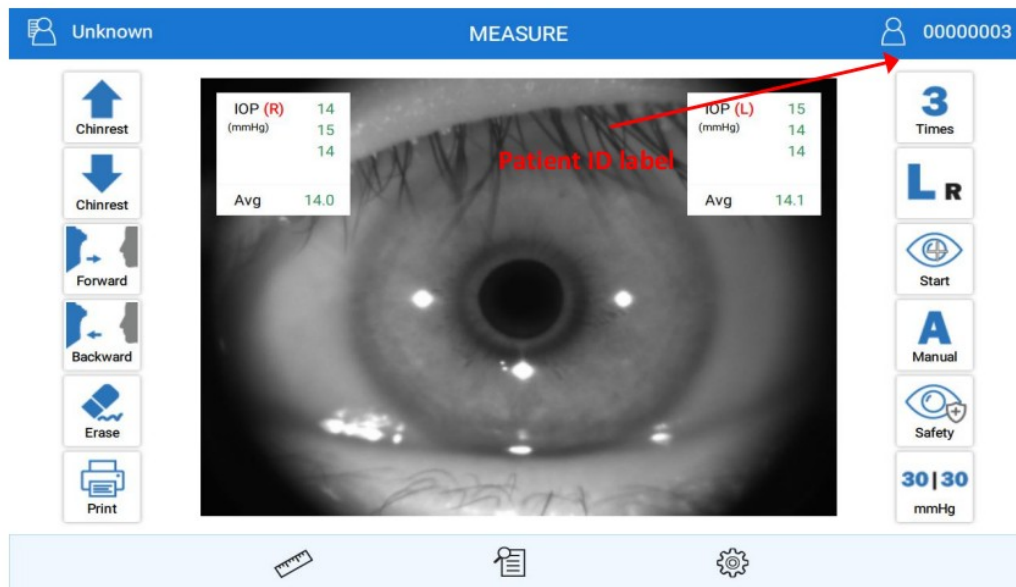




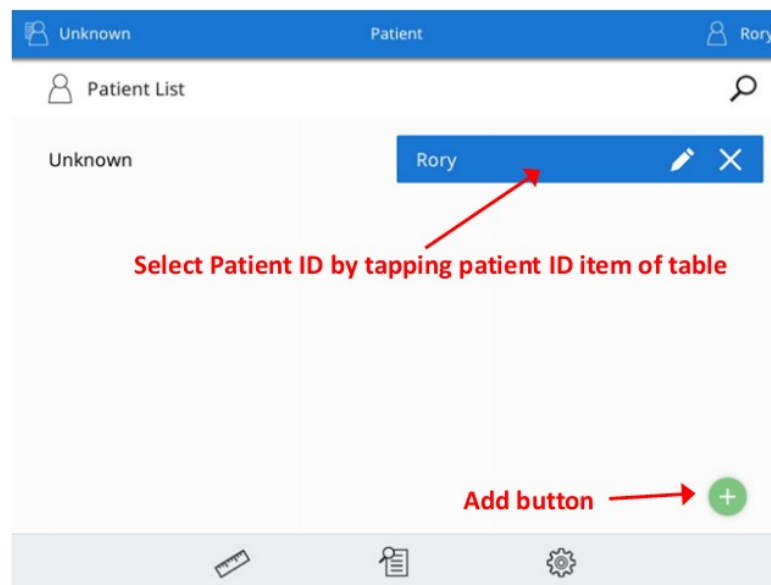
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4.1.4 Set Patient ID

Step1. Tap Patient ID label. The patient management page is displayed on the screen.

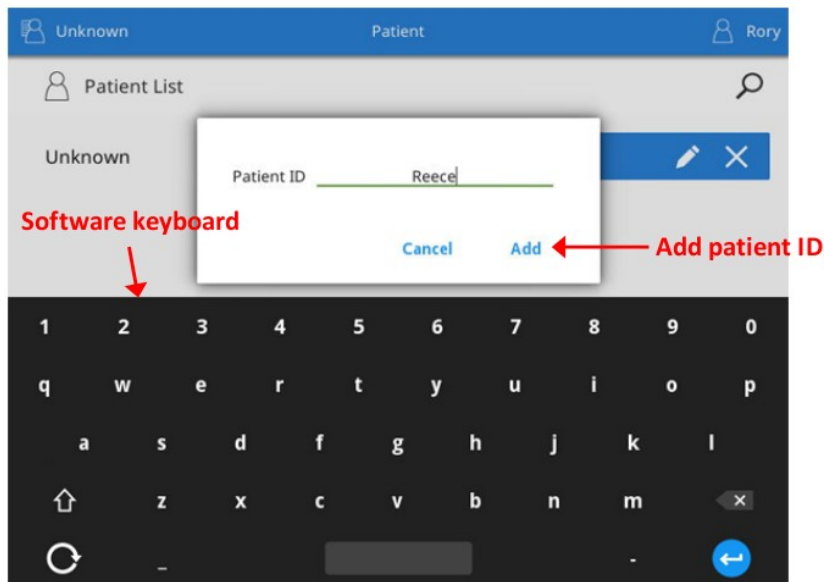


Step2. Select a patient ID from patient table or tap Add button to add a new patient.

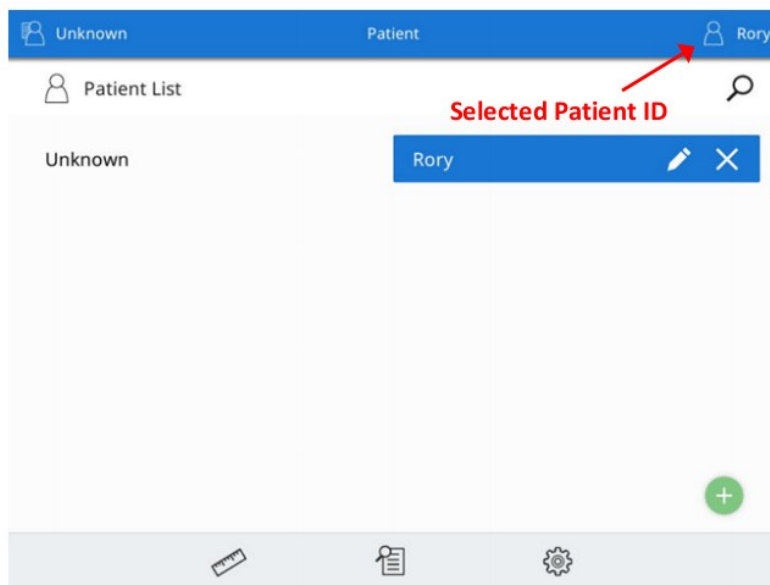




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Step3. Make sure the selected patient ID is shown on the Patient ID label.



Step4. Tap Measure button to return to measurement page

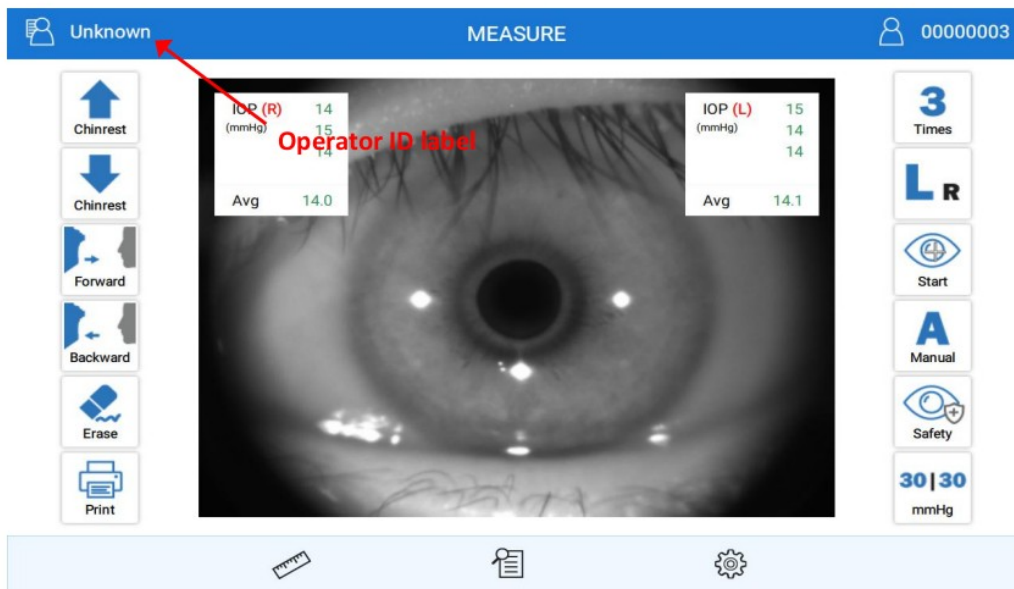
NOTE: If Unknown patient is selected, the serial number is displayed on the Patient ID label.



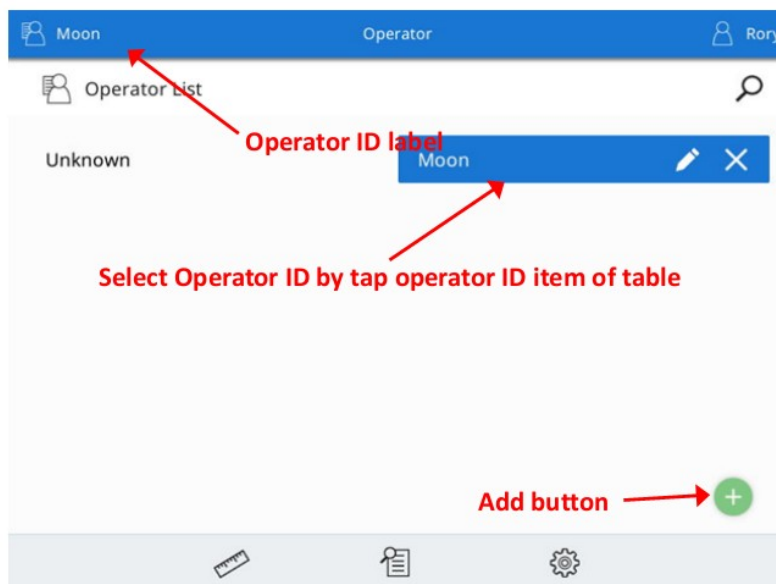
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4.1.5 Set Operator ID

Step1. Tap Operator ID label. The operator management page is displayed on the screen.

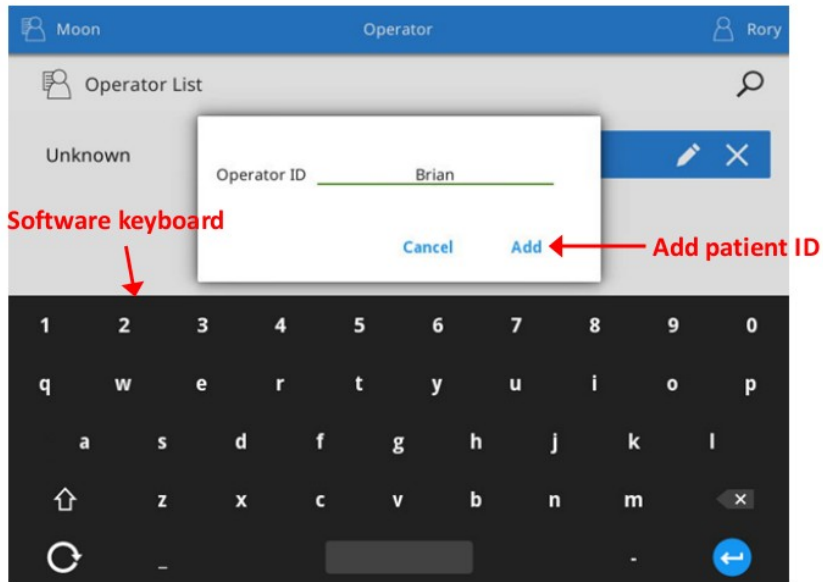


Step2. Select an operator ID from operator table or tap Add button to add new operator.

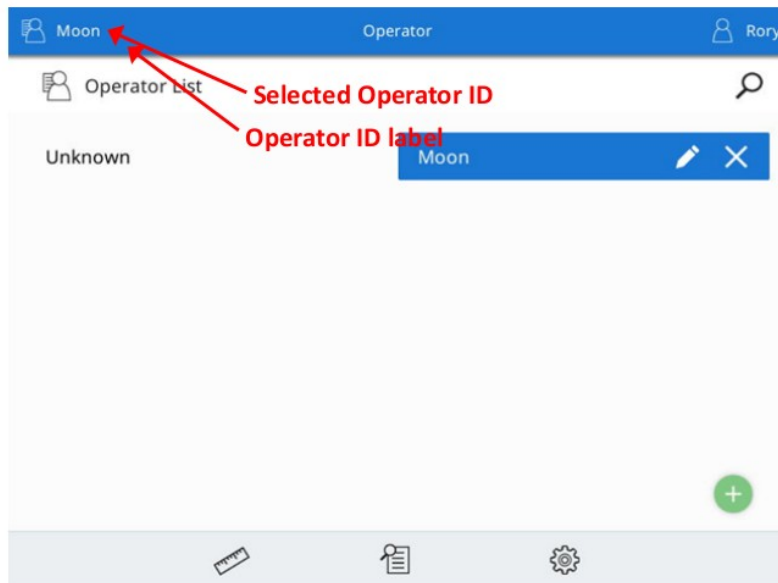




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Step3. Make sure the selected operator ID is shown on the Operator ID label.



Step4. Tap Measure button to return to measurement page

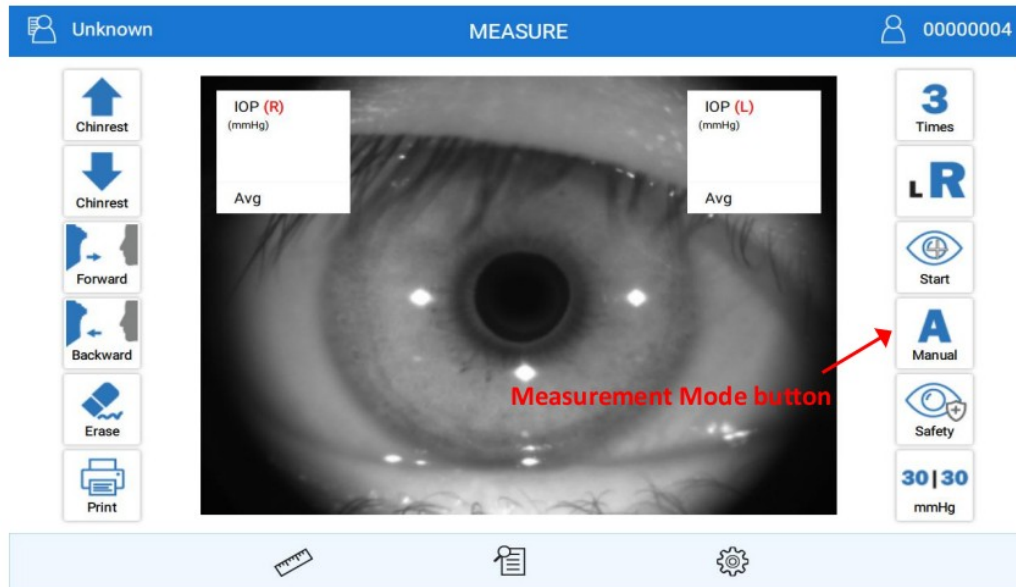


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4.2 Auto Measurement

4.2.1 Set Measurement Mode

Step1. Tap Measurement Mode button. The current measurement mode is displayed on the icon of button.



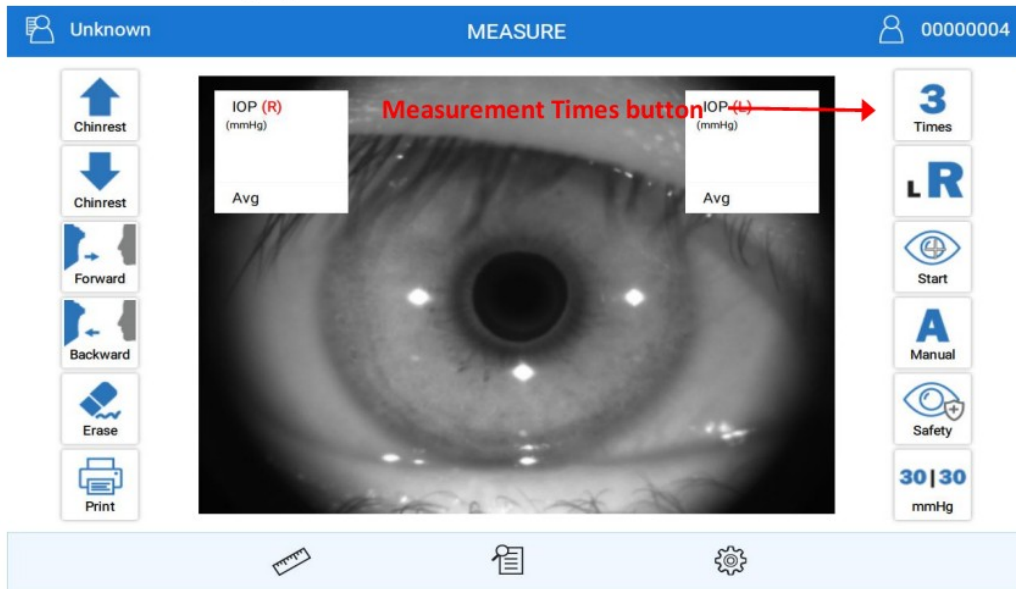
NOTE: The Measurement Mode button is an Auto/Manual button.



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4.2.2 Set Measurement Times

Step1. Tap Measurement Time button. The current measurement time is displayed on the icon of button.



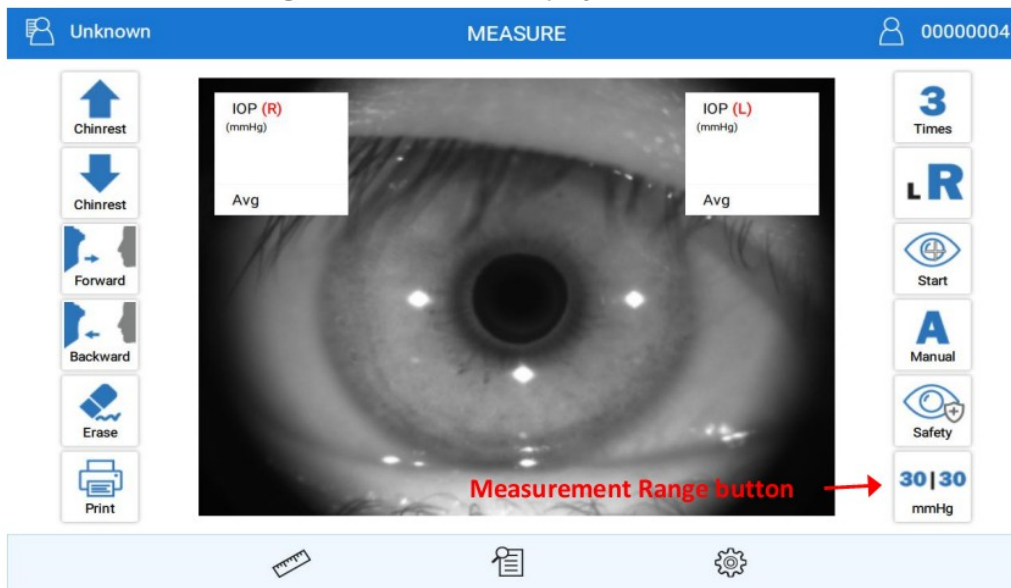
NOTE: The measurement time can be set from 1 to 3 for auto measurement mode.



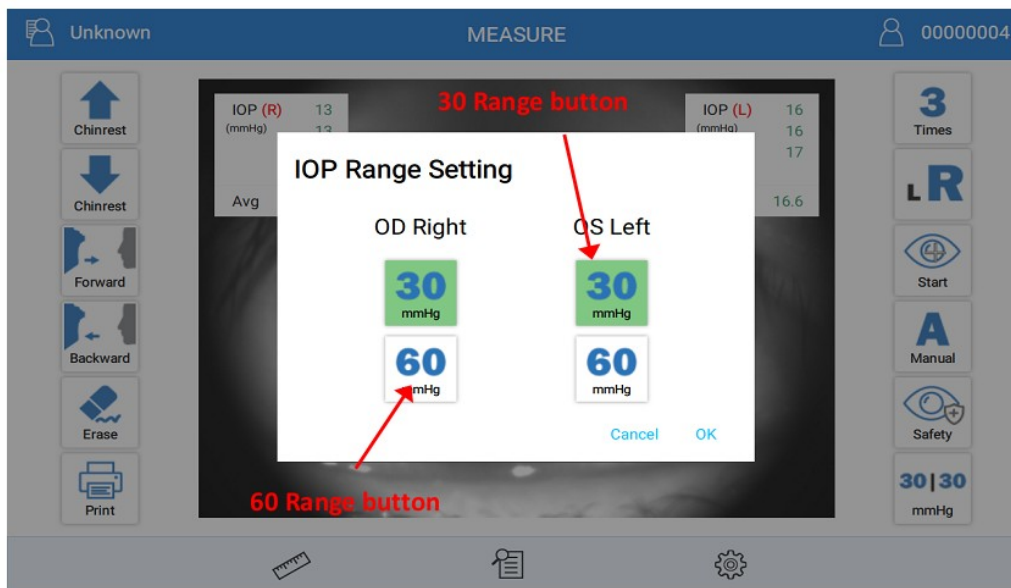
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4.2.3 Set Measurement Range

Step1. Tap Measurement Range button. The measurement range management window is displayed on the screen.



Step2. Tap 30 or 60 range button for left/right eye.



Step3. Tap OK button to save measurement range

NOTE: The measurement range is individually for the left/right eye.

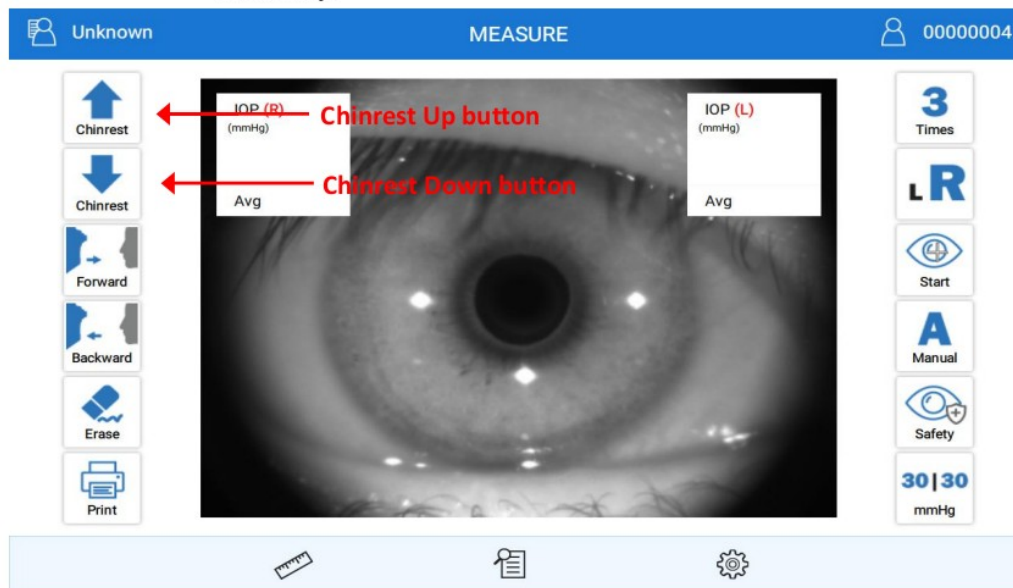


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4.2.4 Auto Alignment and Measurement

Step1. Adjust the height of table. Make sure patient can sit comfortably.

Step2. Tap Chinrest Up/Down button to adjust the eye of patient. Make sure the eye of patient aligns with the canthus mark on the chinrest assembly.

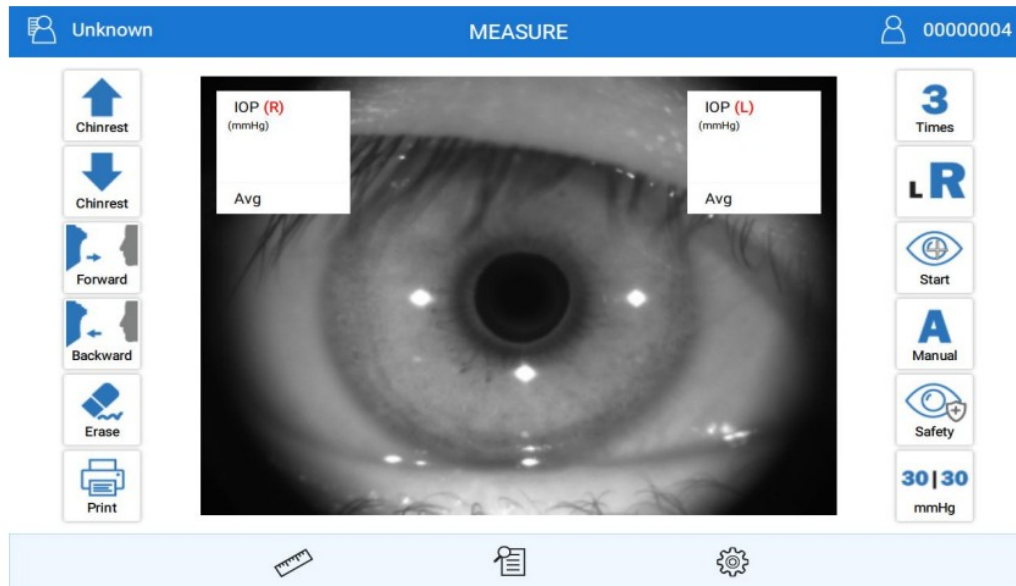
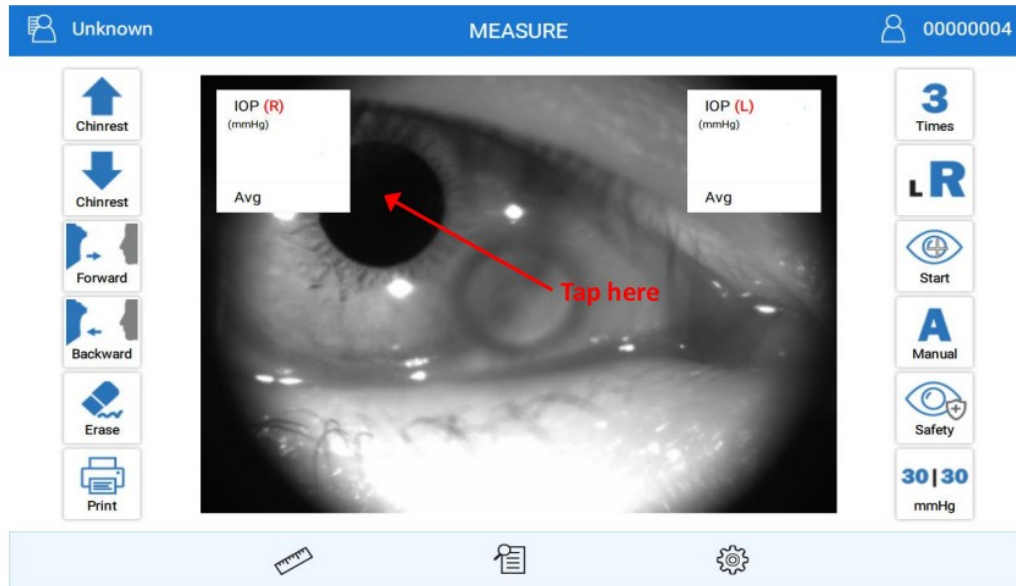


Step3. Make sure the pupil is displayed on the video window.

Step4. Tap the pupil to align measurement head and pupil.



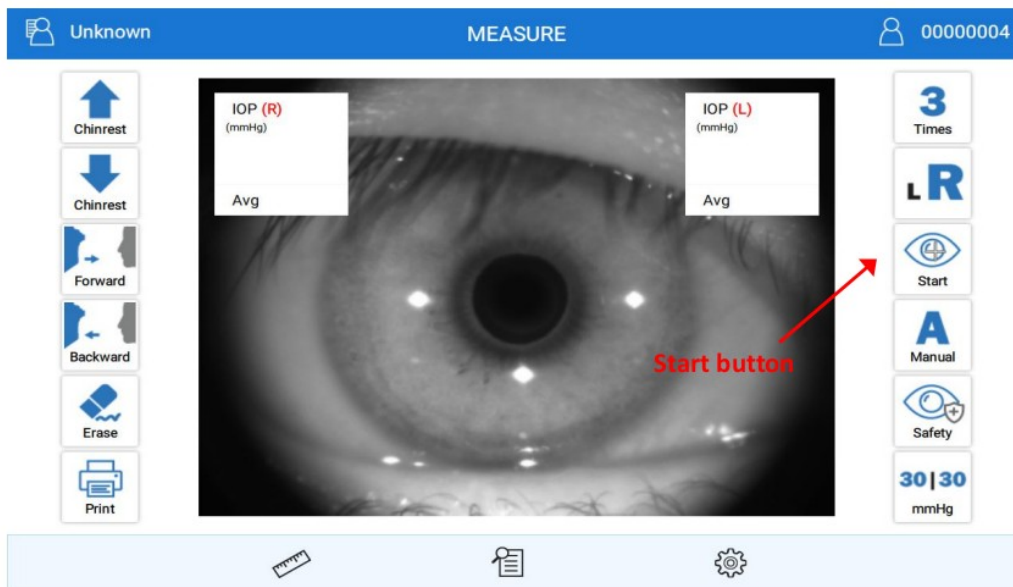
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Step5. Tap the Start button to perform the auto alignment and measurement.

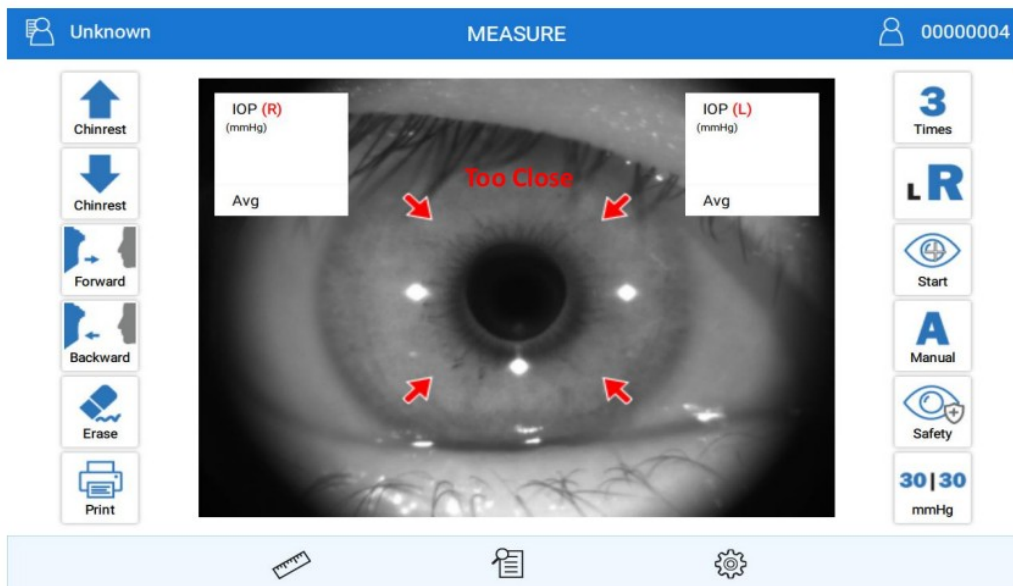


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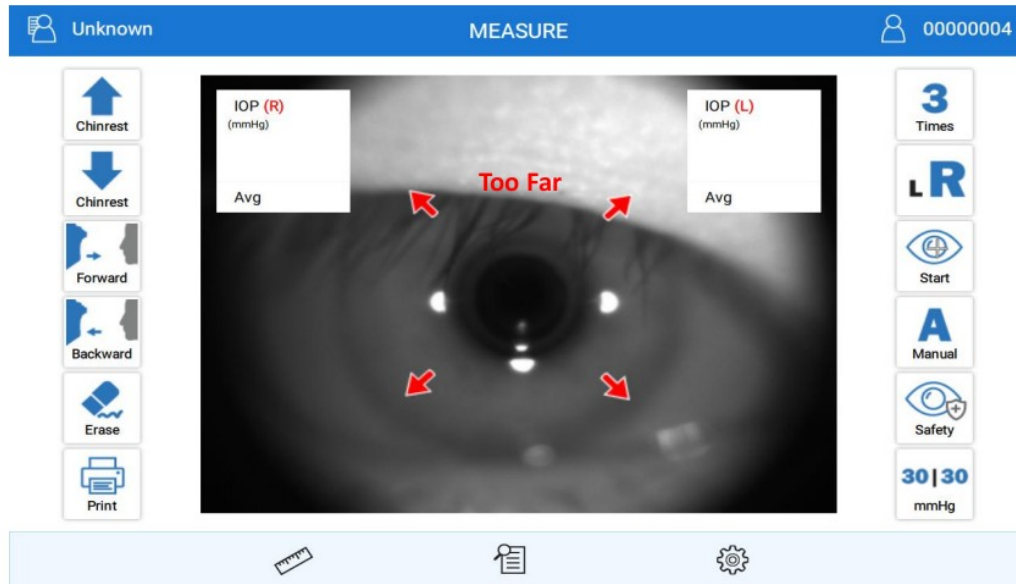
NOTE:

- 1). If the measuring head reaches the movement limitation, the limitation mark image will show on the screen. Before auto measurement, the measurement head should not at movement limitation position.

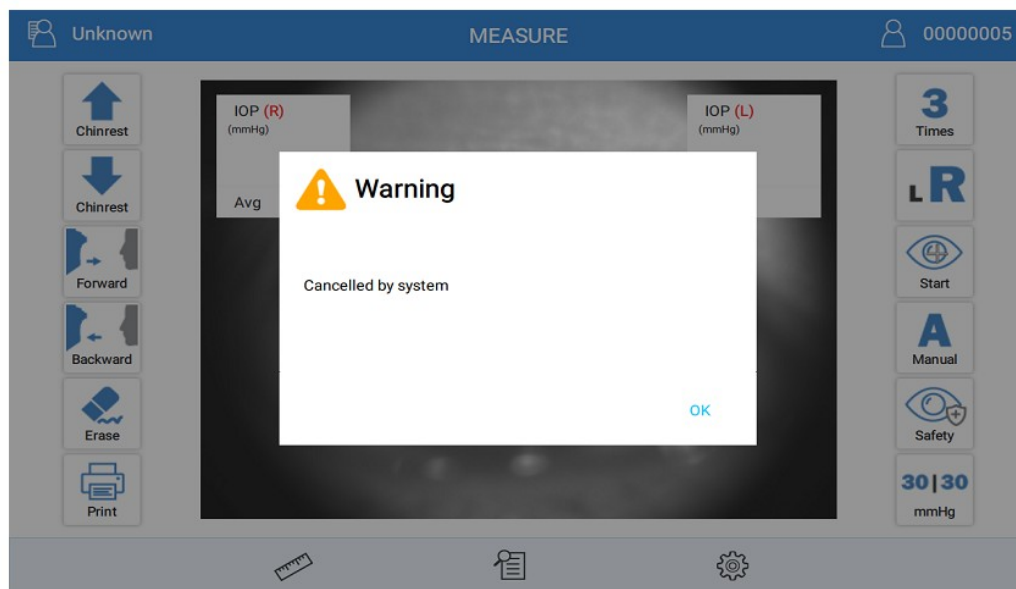




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- 2). When the auto print function is enabled and the valid measurement result is equal to measurement time setting, the printer prints out the measurement result automatically after measuring left/right eyes.
- 3). If the pupil cannot be found and aligned within 20 seconds, the warning message "Cancelled by system" is displayed.

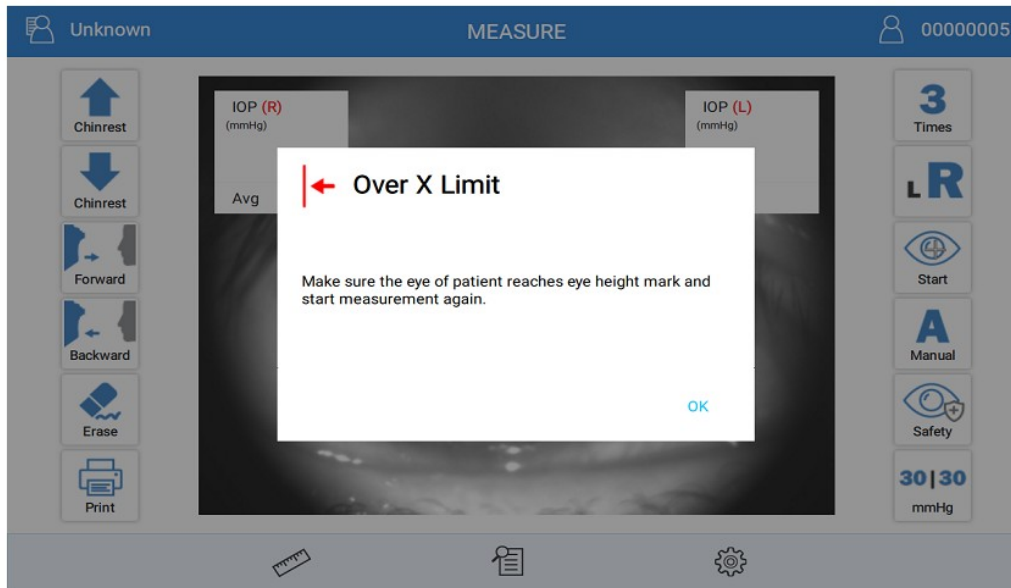


- 4). If the movement limitation has reached during auto alignment, the

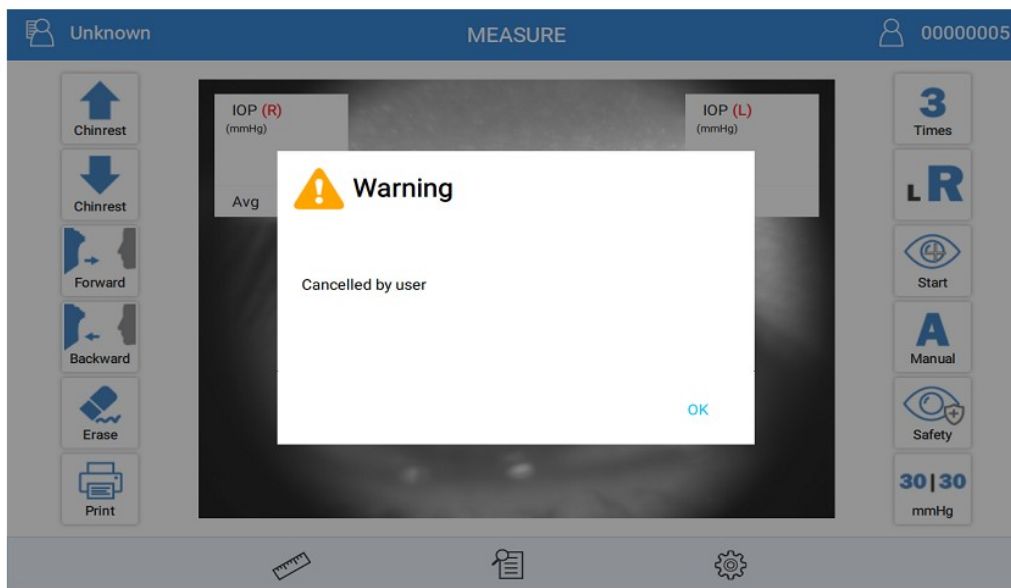


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warning message “X/Y/Z movement limitation has reached” is displayed.



5). If tap the Cancel button during auto alignment, the message “Cancelled by user” is displayed.



6). If the pupil cannot be found during switch eye, the message “Cannot find pupil” is displayed.

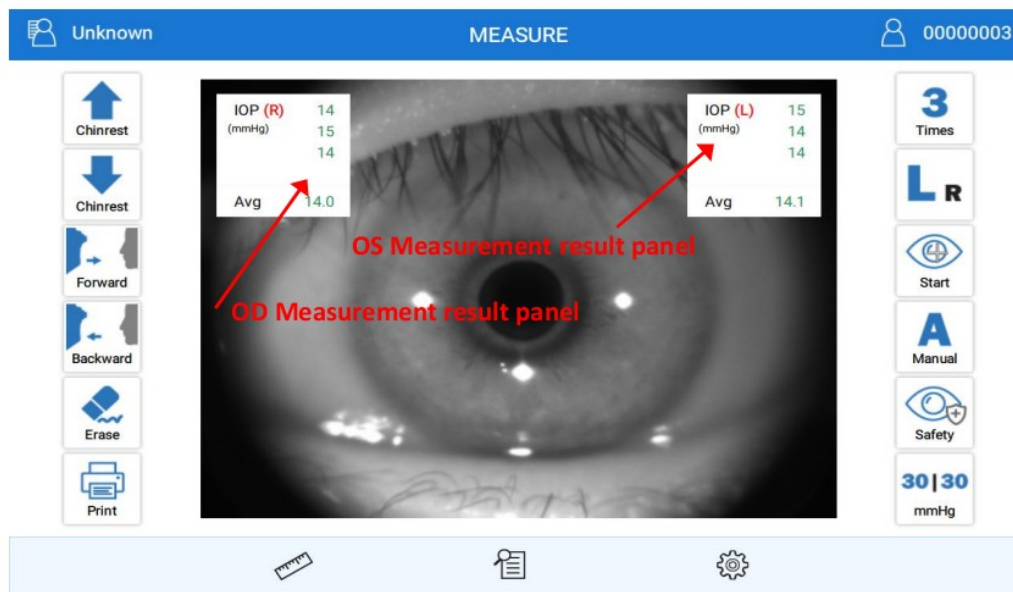
7). All buttons disabled during auto alignment and measurement.



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4.2.5 Measurement Result

The latest three measurement data are displayed on the panels.



NOTE: Above graph shows measurement result for OS and OD. If the result is with [], it means the signal quality of this measurement is not good enough and it won't be included into final average data.

4.3 Manual Alignment and Auto Measurement

4.3.1 Set Measurement Range

Step1. Tap Measurement Range button. The measurement range management window is displayed on the screen.

Step2. Tap 30 or 60 range button for left/right eye.

Step3. Tap OK button to save measurement range

NOTE: The measurement range is individually for left/right eye.

4.3.2 Set Measurement Mode

Step1. Tap Measurement Mode button to Manual icon. The message "Please tap the center of pupil" is displayed.

Step2. Tap the center of pupil until auto measurement.



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NOTE: The measurement head aligns the Z-axis automatically every tapping.

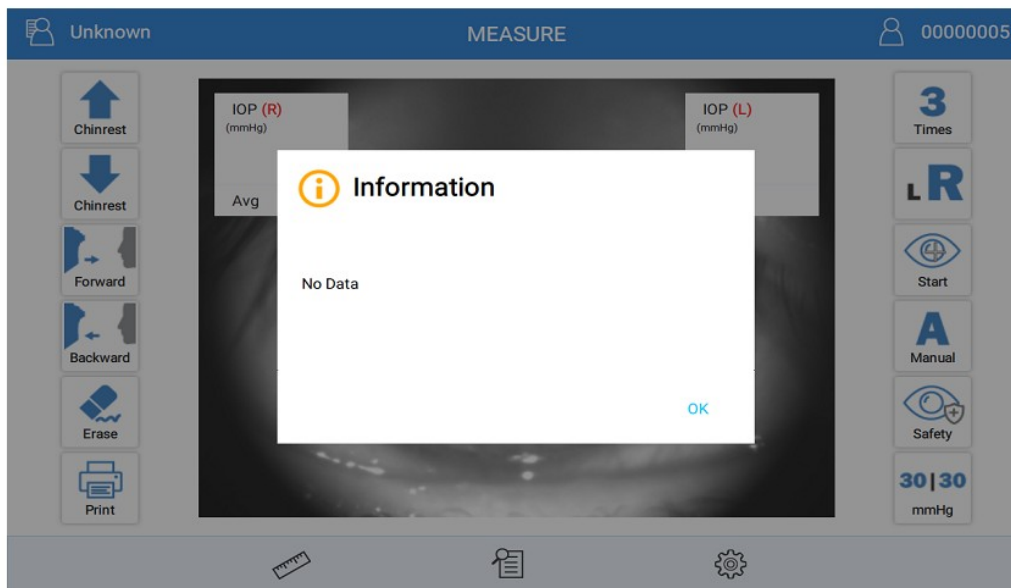
4.4 Print Measurement Result

4.4.1 Print Measurement Data

Step1. Tap the Print button to print out measurement data.

NOTE:

1). If no data to print, the warning message “No Data” is displayed.



2). The system creates and selects the next serial number after data printed.

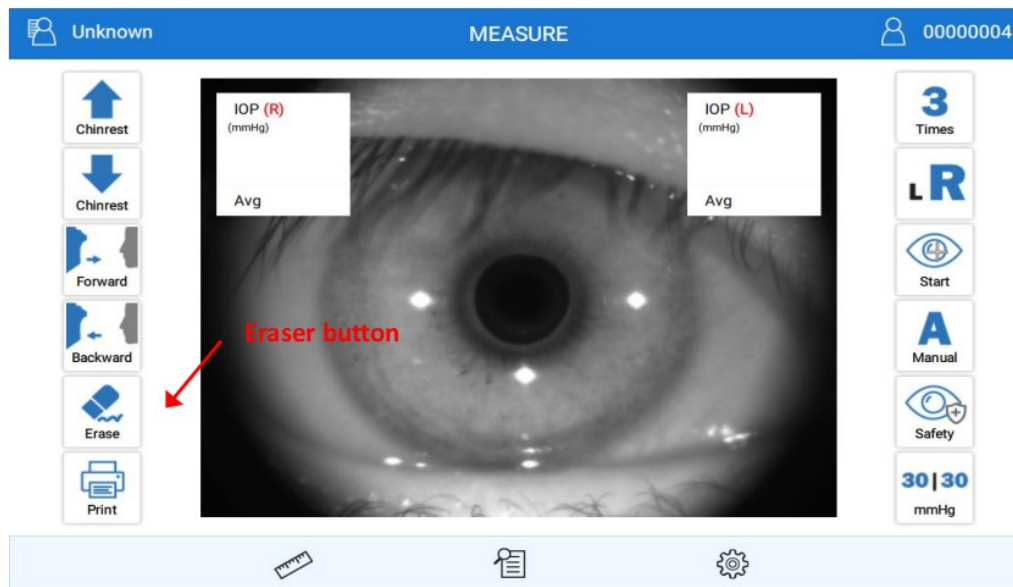


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4.5 Erase All Measurement Result

4.5.1 Clear All Measurement Result

Step1. Tap Eraser button to clear all measurement result. The measurement head moves to right eye after data cleared.



NOTE: The system creates and selects the next serial number after data cleared.

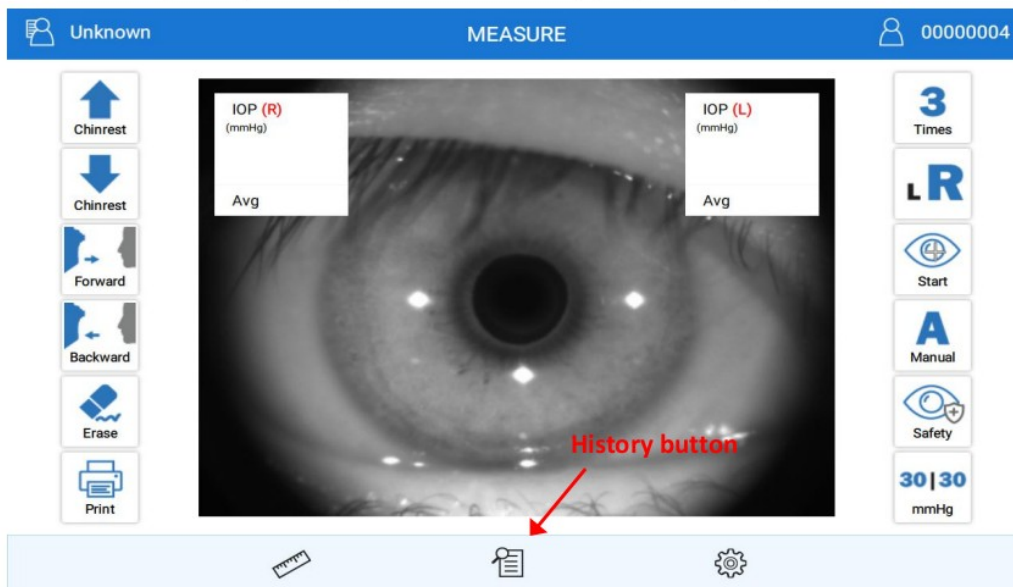


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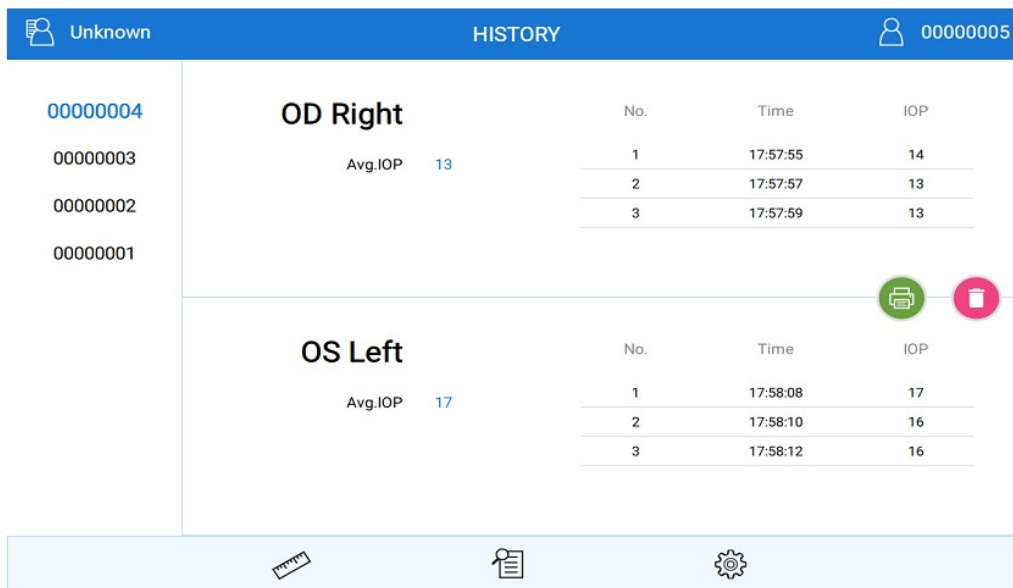
4.6 Show Measurement History

4.6.1 History Page

Step1. Tap History button. The history page is displayed on screen.



Step2. Swipe date or serial number list and select date or serial number



Step3. Review all measurement result from OD/OS panel.



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NOTE:

1). The date list is displayed at left of screen if the selected patient is not Unknown.

Serial Number List

Serial Number	OD Right Avg.IOP	OS Left Avg.IOP
00000004	13	17
00000003	13	17
00000002	13	17
00000001	13	17

2). The serial number list is displayed at left of screen if the selected patient is Unknown.

Date List

Date	OD Right Avg.IOP	OS Left Avg.IOP
2020-12-25	13	13



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4.6.2 Print History Data

Step1. Select a date or serial number by tap item of list

Step2. Tap Print button.

The screenshot shows the 'HISTORY' screen with a blue header bar containing 'Unknown', 'HISTORY', and '0000005'. On the left, a list of serial numbers is shown: 0000004, 0000003, 0000002, and 0000001. The main content area is divided into two sections: 'OD Right' and 'OS Left'. Each section displays 'Avg.IOP' and a table of three rows with columns 'No.', 'Time', and 'IOP'. A red arrow labeled 'Print button' points to a green print icon and a red trash icon.

OD Right		No.	Time	IOP
Avg.IOP	13	1	17:57:55	14
		2	17:57:57	13
		3	17:57:59	13

OS Left		No.	Time	IOP
Avg.IOP	17	1	17:58:08	17
		2	17:58:10	16
		3	17:58:12	16



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4.6.3 Delete History Data

Step1. Select a date or serial number by tap item of list

Step2. Tap Delete button

The screenshot shows the 'HISTORY' screen for an 'Unknown' user (ID: 00000005). It displays two sections: 'OD Right' and 'OS Left'. Each section has a table of measurement data and a 'Delete button' (a pink trash can icon) to its right. A red arrow points to the delete button for the OD Right data.

OD Right		No.	Time	IOP
Avg.IOP 13		1	17:57:55	14
		2	17:57:57	13
		3	17:57:59	13

OS Left		No.	Time	IOP
Avg.IOP 17		1	17:58:08	17
		2	17:58:10	16
		3	17:58:12	16

4.7 Finishing the instrument

Turn OFF the “Power Switch” of the instrument.

5. Optional Operation

5.1 Common Setting

Step1. Tap the Setting button. The setting page is displayed on the screen.



5.2 Full Auto

ETN-1800 switches to another eye automatically when Full Auto setting is ON.

5.2.1 R/L Distance

This value represents the distance between left eye and right eye. The range of R/L distance is from 56 mm to 66 mm.

5.2.2 Reset Serial Number

Reset serial number and delete all measured data.

5.2.3 Pressure Unit

Provide two options which are mmHg and hPa for unit of IOP value.

5.2.4 Package

Enter to package mode

5.2.5 Engineering Page

Enter to engineering page.

5.2.6 SN and Version

Display serial number and software version of ETN-1800

5.3 Printer Setting

Step1. Tap the Setting button. The setting page is displayed on the screen.



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SN: 51111-1111-111
SW Version: v1.0.0.0

Printer Setting button



Step2. Tap the Printer button. The printer setting page is displayed on the screen.



5.3.1 Auto Print

Printer prints out the measurement result after auto measurement.

5.3.2 Print Patient ID

If enabled, the printer prints Patient ID on the paper.



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5.3.3 Output Message

If enabled, the printer prints message on the bottom of paper.

5.3.4 Auto Export

Prints out the measurement result from serial port after auto measurement.

5.3.5 Message

The message can be set by software keyboard.

5.4 Date & Time Setting

Step1. Tap the Setting button. The setting page is displayed on screen.



Date & Time Setting button



SN: 51111-1111-111
SW Version: v1.0.0.0



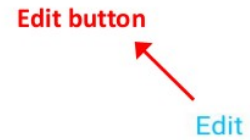
Step2. Tap the Date & Time setting button. The date time setting page is displayed on the screen.



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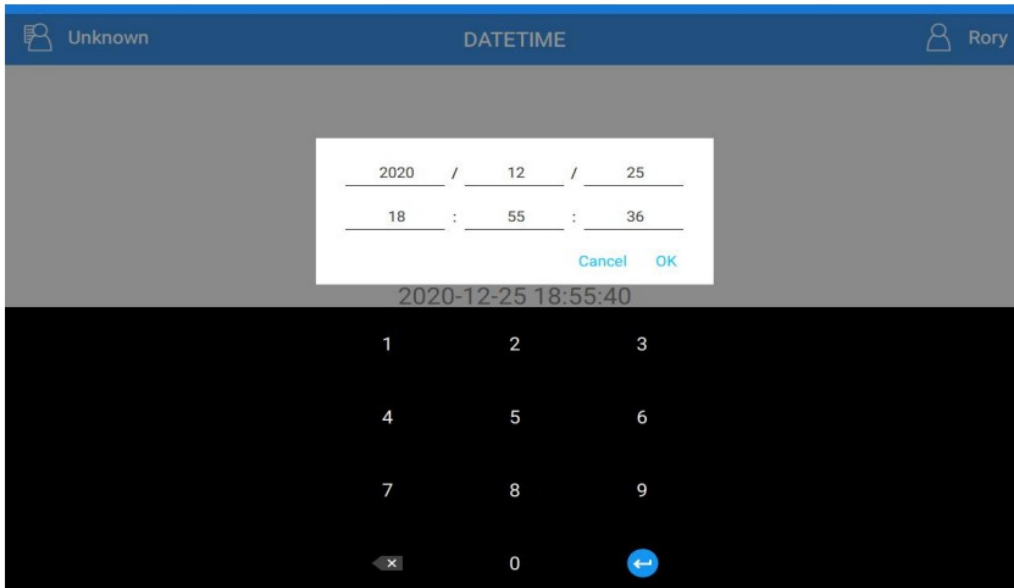


2020-12-25 18:54:06



Step3. Tap Edit button. The date and time management window is shown on the screen.

Step4. Tap the number pad to set date and time.



Step5. Tap OK to save new date and time.



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6. Specifications

6.1 Product Specification

Intraocular Pressure Measurements	
Measurement range	1 – 60 mmHg
Measurement range setting	Auto / 30 mmHg / 60 mmHg
Measurement principle	Air puff method
Display units	mmHg / hpa
Working distance	11 mm
Measurement mode	Fully automatic / Automatic / manual
Alignment	Fully automatic 3D tracking
Chinrest	Motorized
Display	Touch LCD screen
Printer	Thermal line printer
Eye Fixation Target	Internal LED fixation light
Power supply	AC100V to 240V (1.1A~1.9A), 50/60Hz
Operation Movement Range	Front / Back: 40mm
	Left/ Right: 90mm
	Up/ Down: 30mm
Chinrest Movement Range	Up/ Down:70mm
Dimensions (W x D x H)	282mm(W) x 500mm(D) x 500mm (H)
Weight	17 Kg

NOTE: USB interface is used to connect USB mass storage device.



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6.2 Environmental conditions

1) Operating Conditions:

- Temperature: 10°C–35°C
- Humidity: 30%–90%RH
- Atmospheric pressure: 800–1060 hPa

2) Storage Conditions:

- Temperature: -10–55°C
- Relative Humidity: 10–95%RH
- Atmospheric pressure: 700–1060 hPa

3) Transportation Conditions:

- Temperature: -40–70°C
- Relative Humidity: 10–95%RH
- Vibration, Sinusoidal: 10–500Hz, 0.5g
- Shock: 1/2 Sine Wave, 6 msec, 30G peak (packaged)
- Bump: 1/2 Sine Wave, 6 msec, 10G peak (package)



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7. Maintenance

This section describes ETN-1800's daily inspections, cleaning, disinfection, and refilling the chinrest paper.

Caution

-
- Before using ETN-1800, for safety reasons, be sure to perform the daily inspection.
 - Have a regular inspection performed for ETN-1800 at least once a year by the representative that is designated by Crystalvue.
-

Maintenance and Inspection

Do the following inspections before using ETN-1800 to ensure that it is used safely and correctly. If a problem is found during the inspection and you are unable to correct the problem, please contact the Ezer representative or distributor from whom you purchased ETN-1800.

Checks before turning on the power

Check the following items before turning on the power.

- **Cables**
 - 1) The power cord and connection cable are not damaged and their insulation is not torn.
 - 2) The power cord is fully and securely inserted into the AC connector on the main unit and the AC outlet.
- **Main unit**
 - 1) There are no scratches or dirt on the nozzle. Clean the nozzle if they are dirty.
 - 2) There is no dirt on the monitor. Clean the monitor if it is dirty.
 - 3) The forehead rest is disinfected.
 - 4) The chinrest paper is loaded.



If the chinrest paper is not being used, disinfect the chinrest.

5) The printing paper is loaded.

6) The covers or other parts are neither damaged nor loose.

Checks after turning on the power

Check the following items after turning on the power ◦

- 1) The power LED lights ◦
- 2) The chinrest moves up and down smoothly
- 3) The measurement unit moves smoothly in all directions (forward, back, left, right, up and down).

7.1 Measuring window

- 1) It is recommended to regularly clean the measuring window of ETN-1800 on monthly basis or when needed.
- 2) Wipe the surface with a soft cleaning cloth, from the center outward.
- 3) If there is any foreign matter on or around the air nozzle, gently wipe the air nozzle without rubbing.

7.2 Chinrest and forehead rest

Soak the cleaning cloth or towel in disinfecting solution or use a wet isopropyl alcohol cleaning paper pad. Wipe the chinrest and forehead rest with the cleaning towels or paper pad before or after use.

If the chinrest paper is used, remove one piece for each patient.

7.3 LCD Monitor/Touch panel

Turn off the power first, and use a soft cleaning cloth to wipe the exterior of the LCD display lightly. Do not press the LCD monitor using an object with a hard tip.



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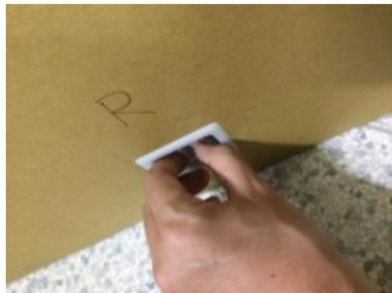
8. Installation

8.1 Getting start

8.1.1 Place carton box



8.1.2 Remove the buckles



8.1.3 Take off the machine





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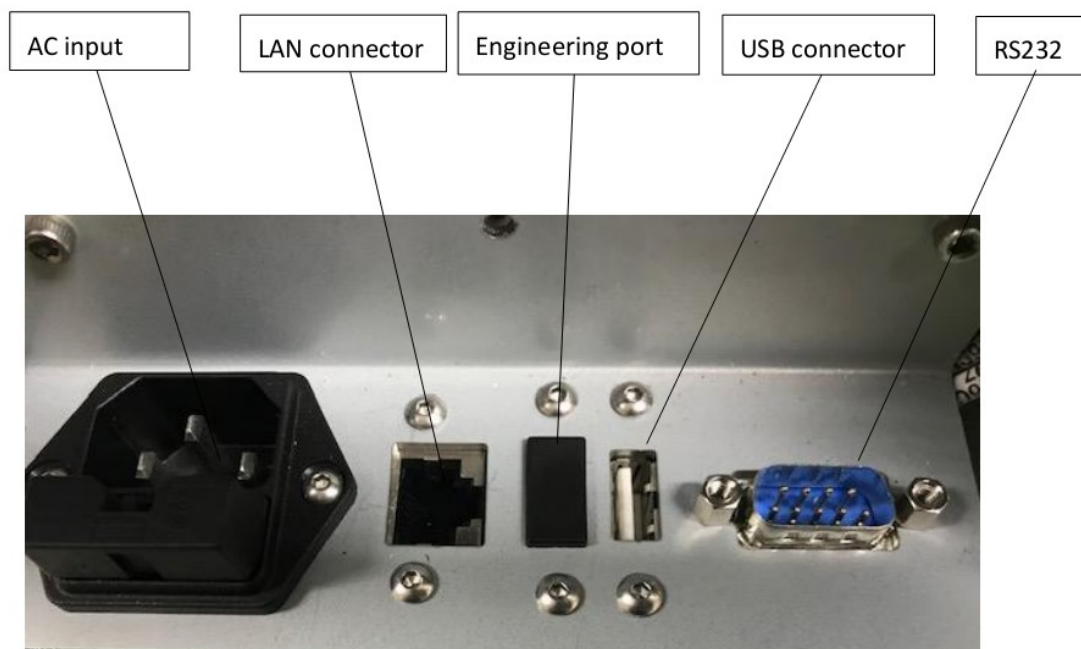
8.1.4 Set machine on the table





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8.1.5 Connect the power cord (USB cable/ LAN connector/ RS232 depend on the requirements)



Do not connect the engineering port unless with authorization of the manufacturer.

Lan connector is only used for manufacture process, no function for user.



9990 NW 14th Street Unit # 105 Doral, Florida, 33172

United State

