

# iLED2000 LED 光固化机

iLED2000 英文说明书

备注：封面幅面为 A4, 压缩包里说明书实际幅面为 A6。

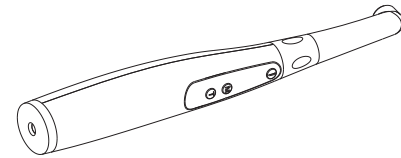
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# LED Light Curing Device iLED2000

## Operating instructions



For more information,  
please scan to log in the official website.



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## 1 Product introduction

### 1.1 Preface

URIT Medical Electronic Co., Ltd. is a professional manufacturer of dental equipment, with strong independent technological innovation capabilities and a sound quality management system.

### 1.2 Product Principles

The LED curing machine illuminates photosensitive resin to solidify it quickly based on the principle of light radiation.

### 1.3 Product Scope

Suitable for irradiating a polymer-based repair material to cure it in dental practice.

### 1.4 Product Features

It has constant light power output. Curing effect is not affected as the battery power drops in use.

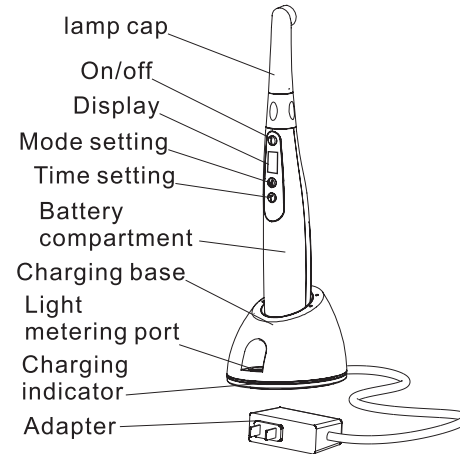
High-efficiency electro-optical conversion. It can be used more than 500 times after fully charged (calculated by 10s timing in full power P2 mode, the number of times the battery is fully charged to the low battery alarm)

Ergonomically designed. Increase the texture of the hand and the comfort of the treatment.

Automatic shutdown function.

## 2 Product performance structure and composition

The curing machine is mainly composed of a host, a charging base and a power adapter.



## 3 Technical basic parameters

Volume: 33mmx29mmx226mm

Net weight: 118 g

Cross weight: 500 g

Machine configuration: see packing list for details

Power supply: rechargeable lithium battery

Battery: DC3.7 V/2200 mAh, battery with overvoltage, overcurrent and short circuit protection.

Power adaptor: AC100-240 V 50/60 Hz

Fuse: T1AL 250 V

Adaptor input power: 22 VA

Charging base input: DC 5 V  $\approx$  1A

LED lamp performance:

10W high power LED with blue light

Wavelength: 420nm~480nm

Category: Class 1

Inspection method: If the LED is used correctly, the LED lights, which indicates that the lamp is in good condition.

Radiation:  $\geq 700 \text{ W/m}^2$

Optical effective area of light source:  $75 \text{ mm}^2$

The dental resin materials commonly used in clinical practice can match the wavelength of the light curing, such as 3M, Dentsply and other resins.

Use environment:

Ambient temperature:  $5^\circ\text{C} \sim 40^\circ\text{C}$

Relative humidity:  $\leq 80\%$

Atmospheric pressure:  $75 \text{ kPa} \sim 106 \text{ kPa}$

Safety classification of equipment :

Classified by operating mode: short-running equipment.

Classified by electric shocktype: Class II, internal power supply.

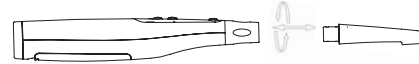
Classified by the degree of protection against electric shock: Type B application.

Classified by protection against incoming liquid: common equipment (IPX0).

Classified by safety level when used in flammable anesthetic gas mixed with air or flammable anesthetic gas mixed with oxygen or nitrous oxide: non-AP, APG type equipment.

#### 4 Installation and removal methods

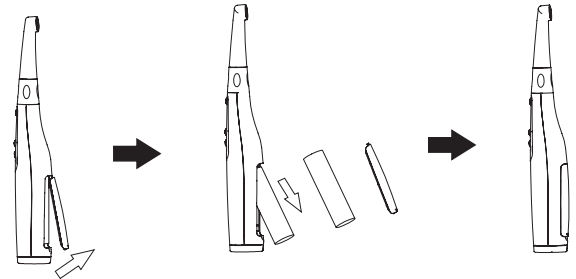
4.1 The head of the main unit can be rotated 360° clockwise or reverse, and the head of the main unit can be removed and replaced as the picture shows.



4.2 Tighten and install anti-dazzling screen on the light guide.

4.3 Battery replacement

Hold the main body in one hand, remove the battery compartment in one hand, then remove the old battery from the battery compartment, replace it with a new one, and then re-fasten the battery compartment and mount it on the main unit. The battery can be used normally regardless of whether it is being worn or not, and there is no danger in safety, as shown in the figure.



4.4 When charging, connect the USB cable type A male connector to the power adapter, then connect the power adapter to the AC 100~240V network power, and then insert the USB cable's Micro USB connector into the charging socket of the charging base. Place the main unit in the center of the charging base to charge.

## 5 Method of operation

5.1 Press "M" button of the curing machine to select the density output of the following three powers:

- High power density: "P1" is displayed at the bottom of the right side of the display, and blue light is illuminated at high power density(1600 mW/cm<sup>2</sup>~1800 mW/cm<sup>2</sup>).
- Standard power density: "P2" is displayed at the bottom right of the display, and blue light is illuminated at a standard power density(1000 mW/cm<sup>2</sup>~1200 mW/cm<sup>2</sup>).

5.2 Press the "M" button of the curing light until the "1.0" symbol is displayed, and then press the "T" button of the curing machine to select any of the following three modes to enter the working state:

- Full power mode: The display shows the "1.0" symbol and the blue light is illuminated at full power.
- Progressive mode: The display shows the "2.0" symbol, the blue power is gradually increased from weak, and the maximum power can be reached in 5 seconds.
- Pulse mode: The "3.0" symbol is displayed in the middle of the right side of the display, and the blue light works in pulse mode.

When the desired mode is displayed, press the "M" button to confirm.

5.3 Press the "T" button of the curing light to set the curing time .

The P2 mode has timing of 1, 2, 3, 4, 5, 10, 15, 20, 25, 30, 35, and 40 seconds available for selection.

The P1 mode has timing of 1, 2, 3, 4, 5, 10, 15, and 20 seconds available for selection.

5.4 When using, put the disposable isolation sleeve into the head of the main unit, align the light source with the desired curing position, press "I" on/off key. The main unit will make a "beep" sound, emit blue light, and work according to the selected working mode. The digital display shows a countdown from the selected timed time and ends when it is timed to zero. Then the digital display shows the original timed time.

5.5 At any time during the work process, press "I" to open/close the button to end the work.

5.6 After the end of one irradiation period, press the "I" on/off key to start the next illumination cycle. If it is obvious that the handle starts to burn, stop the main unit working until it is completely cooled before starting work. The cooling reference for different gear positions is as follows:

P2 grade: work for above 15S, cooling work for 3 S

P1 grade: work above 10S, work is prohibited for 3 S

5.7 Battery indicator: The battery has a battery power detection function inside. The battery indicator is on the right side of the display. If there is only one space left, it should be charged as soon as possible.

5.8 When charging is required, connect the USB cable type A male connector to the power adapter, then connect the power adapter to the AC 100~240 V power supply, and then plug the USB cable's Micro USB connector into the charging socket of the charging base. At this time, the charging base indicator lights up in blue, indicating that the device is in standby mode. After the main unit is placed in the center of the charging base, the charging base indicator lights up in green, indicating that a host is detected. At the same time, the bottom charging indicator of the main unit lights up green, indicating that charging is started. When charging is complete, the bottom light of the main unit turns blue.

5.9 After use, remove the disposable isolation sleeve from the head of the main unit and throw it into the waster container, As the disposable isolation sleeve is forbidden to be reused. The use of disposable protective sleeves will reduce the power output by 5-10%.

5.10 The machine will automatically shut down after 1 minute of inactivity. Press any key for booting the machine.

5.11 The curing depth of the light-curing composite resin by this machine is not less than 4mm in 10 seconds. It is recommended to keep a distance of 2 mm between the light-emitting surface and the solidified surface.

5.12 Optometry function

Connect the charging dock to the power adapter.

- Adjust the power output mode of the curing machine to P2, align the head of the light source with the illuminating port of the charging base and keep it vertical. Press "I" on/off key.

At the time, the three indicator values of the charging base shall light up.

- Adjust the power output mode of the curing machine to P1, align the head of the light source with the illuminating port of the charging base and keep it vertical. Press "I" on/off key. At this time, the five indicator values of the charging base are all lit.

## 6 Safety and precautions

**Warning: Our responsibility is to provide users with the correct usage rules and safety precautions.**

- The product must be used within the scope mentioned in the manual and cannot be used for other purposes.
- When using the machine for the first time, please charge it for at least 4 hours.
- The curing machine should be used by trained personnel.
- The curing machine should be placed out of reach of children.
- The lamp cap contains fragile glass and is not allowed to be knocked, bumped and dropped.
- In clinical use, the light source should be directly irradiated on the cured resin material to prevent improper irradiation position and affect the curing effect.
- The original light-shielding film must be used. The light-shielding film must be installed correctly. Do not look directly at the light source, otherwise it will cause eye damage.
- Please use the original charger. Other chargers may cause damage to the lithium battery and control circuit.

- It is forbidden to insert metal or other conductor into the charging port of the main unit to avoid short circuit of internal circuit or lithium battery.
- Charge the battery in a cool, ventilated indoor place.
- It should be operated strictly according to the rated working time specified in the manual to avoid damage to the teeth caused by excessive temperature rise.
- It is strictly prohibited to squeeze, vibrate or shake the battery, short the battery, put the battery together with metal objects.
- If the machine is not used for a long time, separate the lithium battery from the main unit and store it separately.
- It is recommended not to use high-frequency and high-voltage equipment in the surrounding 5M, so as not to affect the performance or abnormal operation of the equipment.

### 7 Contraindications and applicable groups

- Those who have done eye surgery, especially those with light sensitivity, and pregnant women and young children, and patients with heart disease should not use the product.
- For patients with retinopathy, the product should be used with caution.
- Patients with a history of sun allergy (including patients with photodermatitis) or those who use photosensitizers should use the product.

Applicable to all groups except contraindications.

### 8 Routine maintenance

8.1 This product does not contain self-repairing spare parts. Machine repair should be carried out by a designated professional or special repair shop.

8.2 Users can replace the anti-dazzling screen and battery in the field. Original parts must be used.

Please contact your local dealer or the company to purchase. Accessories for other brands are prohibited from being used to avoid damage to the curing unit or other hazards.

8.3 This product can be sterilized by high temperature and high pressure (temperature is 135 °C, pressure is 0.22 MPa). If other accessories are to be cleaned or disinfected, please wipe with water or disinfectant, and never soak it. Do not use volatile and easily soluble solvents for cleaning, which can cause the markings on the control panel to fade.

8.4 After each use, use a 75% alcohol cotton ball to scrub the ends to avoid contamination and reduce the light guiding effect.

8.5 When cleaning, unplug the power supply. Do not immerse the machine in water for cleaning.

8.6 If the battery is low, please charge it in time to ensure that the battery does not lose capacity. If it is not used for a long time, the lithium battery must be taken out and the battery should be charged once every 3 months.



## 9 Fault removal

Fault	Possible reason	Treatment method
No indication, no action	1. The battery in the curing machine has no electricity. 2. The battery is damaged. 3. Protect the battery of main unit	1. Connect to the power supply to charge/replace the battery. 2. Replace the battery. 3. Connect to the charger for activating.
The display shows Er	The main unit has failed.	Send to the maintenance department for repair.
Display flashes	The battery voltage is too low.	Unplug the power plug and re-insert the battery. If it reappears after 15 minutes, replace the battery.
Lack of light intensity	1. The lamp cap is not inserted into the bottom. 2. Resin remains on the surface of the light-emitting end of the lamp cap.	1. Please re-install the lamp holder. 2. Please remove residual resin.

Fault	Possible reason	Treatment method
No charge after plugged into the power adapter	1. The power is not plugged in. 2. The charger is damaged or the specifications do not match. 3. There is impurity on the contact thimble of the charging stand.	1. Unplug and re-access. 2. Replace the charger. 3. Wipe the contact thimble of the charging base with alcohol.
The use time becomes shorter after the battery is charged	Battery capacity becomes smaller	Replace the charger.

[Note]: If the above processing has been completed and the machine still does not work properly, please contact the dealer or the company.

## 10 Storage and transportation

- 10.1 Do not shake. Keep in a cool, dry and ventilated place.
- 10.2 Do not mix with toxic, corrosive, flammable goods.
- 10.3 The product should be stored in an environment where the relative humidity does not exceed 90%, the atmospheric pressure is 75 kPa to 106 kPa, and the temperature is -20 ° C to 55 ° C.

10.4 Should be protected from excessive shake and vibration during transport.

10.5 Avoiding the sun or rain and snow.

### 11 After-sales service

This equipment has not been working properly due to quality problems since the date of sale. With the warranty card, the problem can be repaired by our company, and the specific items are in accordance with the warranty card.

### 12 Environmental protection

This equipment does not contain any harmful ingredients and can be disposed of or destroyed in accordance with local regulations.






























### 13 Special instructions

The company reserves the right to modify the machine design, product technology or accessories, instruction manual and machine packaging content at any time without prior notice. The product image is subject to the actual product, and the final interpretation right belongs to Guilin Veirun Medical Technology Co., Ltd.

### 14 List of accessories

Serial No.	Accessory name	Quantity
1	Anti-dazzling screen	1 piece
2	protective goggles (optional)	1 piece
3	Power adapter + data cable	1 set
4	Charging base	1 piece
5	Rechargeable lithium battery	1 piece
6	420~480 light source head	1 piece
7	Disposable isolation sleeve	1box

## 15 Symbol description

 Product trademark	 Type B application part
 Operating instructions	 Manufacturer
 Serial number	 Electrical and electronic product recycling mark
 Warning	 Atmospheric pressure limit
 Fragile items, handle carefully	 Rotary plug
 Humidity limit	 Temperature limit
 Upwards	 CE marking
 Avoid rained	 Class II equipment
 Direct current	 AC
 Full power mode	 Progressive mode
 Pulse mode	 Battery power
 Ultra high power mode	 High power mode
 Validity period	 LED switch
 Setting switch	 Production date
 Authorised representative in the European community	

## 16 Electromagnetic compatibility

### Note

- 1) Unauthorized alteration or modification of the equipment without the express consent of Guilin URIT Medical Electronic Co., Ltd. may result in electromagnetic compatibility problems with the equipment or other equipment.
- 2) iLED2000 Type light curing device is designed and tested in line with electromagnetic compatibility related operating procedures.
- 3) Portable and mobile RF communication equipment may affect the performance of the iLED2000 curing unit. Strong electromagnetic interference shall be avoided when used, such as near mobile phone, microwave oven.
- 4) The instructions of the guide and the manufacturer are detailed in the annex.
- 5) The equipment or system should not be used close to or stacked with other equipment. If it must be used close to or stacked, it should be observed whether it can operate normally under its use configuration.
- 6) In addition to the transducers and cables sold by the manufacturer of the equipment or system as spare parts for internal components, the use of additional accessories, transducers and cables outside the regulations may result in emission increasing or immunity reducing of the equipment or system.
- 7) Use of accessories, transducers or cables outside of the regulations with equipment and systems may result in emission increasing or immunity reducing of the equipment or systems.

### 16.1 Requirements of cable installation

Cable name	Cable length (m)	Shielded or not
Adapter cable	0.8 m wire	Unshielded parallel

### 16.2 Guide and manufacturer's statement - electromagnetic emission


Guide and manufacturer's statement - electromagnetic emission		
The iLED2000 light curing device is expected to be used in the electromagnetic environment specified below. The purchaser or user should ensure that it is used in this electromagnetic environment:		
Emission test	Emission test	Guide of electromagnetic environment
GB 4824 RF emission	Group I	The iLED2000 curing unit uses RF energy only for its internal functions. Therefore, its RF emissions are low and may not cause any interference to nearby electronic devices.
GB 4824 RF emission	Class B	The iLED2000 curing unit is suitable for use in all facilities, including the home power supply network and the residential public low voltage power supply network which directly connects to home.
GB 17625.1 harmonic emission	Class A	
GB 17625.2 voltage fluctuation / flicker emission	conform	

**The LED Light Curing Device has passed tests according YY 0505-2012/IEC 60601-1-2: 2007, but it is no guarantee of immunity from electromagnetic interference. Avoid using The LED Light Curing Device in high electromagnetic environment.**

### 16.3 Guide and manufacturer's statement - electromagnetic immunity

Guide and manufacturer's statement - electromagnetic immunity			
The iLED2000 light curing device is expected to be used in the electromagnetic environment specified below. The purchaser or user of The iLED2000 light curing device should ensure that it is used in this electromagnetic environment:			
Immunity test	IEC 60601 Test Level	Compliance level	Guide of electromagnetic environment
Electrostatic discharge (ESD) GB/T 17626.2	±6 kV contact discharge ±8 kV air discharge	±6 kV contact discharge ±8 kV air discharge	The floor shall be wood, concrete or ceramic. If the floor is covered with synthetic material, the relative humidity shall be at least 30%.
Electrical fast transient pulse group GB/T 17626.4	±2kV pair power cord ±1kV pair input/output line	±2kV pair power cord	The network power supply should have the quality suitable for typical commercial or hospital environment.
Surge GB/T 17626.5	±1kV differential mode voltage ±2kV common mode voltage	±1kV differential mode voltage	The network power supply should have the quality suitable for typical commercial or hospital environment.
Voltage dip, short interruption and voltage change on the power input line GB/T 17626.11	<5% UT for 0.5 weeks (>95% sag on UT) 40% UT for 5 weeks (60% sag on UT) 70% UT for 25 weeks. (30% sag on UT) <5% UT for 5s (>95% sag on UT)	<5% UT for 0.5 weeks (>95% sag on UT) 40% UT for 5 weeks (60% sag on UT) 70% UT for 25 weeks. (30% sag on UT) <5% UT for 5s (>95% sag on UT)	The network power supply should have the quality suitable for typical commercial or hospital environment. If the user wants The iLED2000 light curing device to run continuously during a power outage, it is recommended that the iLED2000 light curing device be powered by uninterruptible power supply or battery.
Power frequency magnetic field (50/60Hz) GB/T 17626.8	3A/m	3A/m	The power frequency magnetic field should have a power frequency magnetic field level characteristic suitable for typical commercial or hospital environment.
Note: UT refers to the AC network voltage before the test voltage is applied.			

## 16.4 Guide and manufacturer's statement - electromagnetic immunity

Guide and manufacturer's statement - electromagnetic immunity			
The iLED2000 light curing device is expected to be used in the electromagnetic environment specified below. The purchaser or user of the iLED2000 light curing device should ensure that it is used in this electromagnetic environment:			
Immunity test	IEC 60601 Test Level	Compliance level	Guide of electromagnetic environment
RF transmission GB/T 17626.6	3Vrms 150KHz~80MHz		It shall not be used closer to any part of the iLED2000 light curing device, including cables, of portable and mobile RF communications equipment than the recommended isolation distance. This distance should be calculated from the formula corresponding to the transmitter frequency. Recommended isolation distance: $d = \left[ \frac{3.5}{E_1} \right] \sqrt{P}$
RF radiation GB/T 17625.3	3V/m 80MHz~2.5GHz		
			$d = \left[ \frac{3.5}{E_1} \right] \sqrt{P} \quad 80 \text{ MHz} \sim 800 \text{ MHz}$ $d = \left[ \frac{7}{E_1} \right] \sqrt{P} \quad 800 \text{ MHz} \sim 2.5 \text{ GHz}$ <p>8Where P is based on the transmitter's maximum output rated power, in watts (W), and d is the recommended isolation distance in meters (m). The field strength of a fixed RF transmitter is determined by surveying the electromagnetic field and should be lower than the compliance level in each frequency range. Interference may occur near devices marked with the following symbols. </p>
<p>Note 1: The formula for the higher frequency band is used at Frequency 80 MHz and 800 MHz.</p> <p>Note 2: These guidelines may not be suitable for all situations. Electromagnetic propagation is affected by the absorption and emission of buildings, objects and human bodies.</p>			
<p>a. The field strengths of fixed transmitters, such as wireless (cellular/cordless) phones and terrestrial mobile radios, such as base station amateur radio, AM (amplitude modulation) and FM (frequency modulation) radio and television broadcasting, cannot theoretically predict accurately. In order to assess the electromagnetic environment of a stationary RF transmitter, an electromagnetic field survey should be considered. If the measured field strength of the iLED2000 light curing device is higher than the RF compliance level of the above application, The iLED2000 light curing device should be observed to verify that it can operate normally. Additional measures may be necessary if abnormal performance is observed, such as reorienting or positioning the iLED2000 light curing device.</p> <p>b. The field strength should be less than 3V/m over the full frequency range from 150 KHz to 80 MHz.</p>			

## 16.5 Recommended isolation distance between portable and mobile RF communication equipment and iLED2000 light curing device.

Recommended isolation distance between portable and mobile RF communication equipment and iLED2000 light curing device.			
iLED2000 light curing device are expected to be used in electromagnetic environments where radiation RF disturbances are controlled. Depending on the maximum output power of the communication device, the purchaser or user of the iLED2000 light curing device can prevent electromagnetic interference by maintaining the minimum distance between the portable and mobile RF communication device (transmitter) and the iLED2000 light curing device as recommended below.			
Rated maximum output power of the transmitter/W	Distance corresponding to different frequencies of the transmitter /m		
	150 KHz~80MHz	80MHz~800MHz	800MHz~2.5GHz
	$d = \left[ \frac{3.5}{E_1} \right] \sqrt{P}$	$d = \left[ \frac{3.5}{E_1} \right] \sqrt{P}$	$d = \left[ \frac{7}{E_1} \right] \sqrt{P}$
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 the rated maximum output power of transmitters not listed above, the isolation distance d is recommended, d is in meters (m) and can be determined using the formula in the corresponding transmitter frequency column. In the formula, P is the maximum output rated power of the transmitter provided by the transmitter manufacturer and is in watts (W). Note 1: The formula for the higher frequency range shall be used at frequency 80MHz and 800MHz . Note 2: These guidelines may not be suitable for all situations. Electromagnetic propagation is affected by the absorption and reflection of buildings, objects and human bodies.</p>			