

L2S14C

(Portable LED Headlight System)

User Manual



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INTRODUCTION



Portable LED Headlight System: L2S14C is the medical device with lithium-ion battery and LED light source which is suitable for flashing on to watch the wound or surgery spot. As a portable device, it does not need supplementary holder and fiber optic cable. By the help of co-axial & shadow-free illumination, L2S14C provides you with free movement (no wire concern) and excellent color rendering with consistent brightness. This product is the medical device and KFDA approval & registration is described like below table.

Registration No.	1909	Certificate No.	Gyeongin Jesin 07-86
Product Category I	(A) General Instruments	Class	Class 1
Product Category II	A03000 Medical Light and Lamps	Product Category III	A03030.01 Operating Headlamp
Product Model No.	L2S14C		
Manufacturer	Xenosys Co., Ltd.		
Country of Origin	Republic of Korea		

The external figure of product is like below pictures. Please refer to components on page 8 ~ 9.



Table A describes features of L2S14C and detail specifications are described from page 19 to 21.

Model	Power	Spectrum	Lamp Type
L2S14C	Battery	Visible	LED

Table A: Features of L2S14C (Portable LED Headlight System)

SAFETY & PRECAUTIONS

Before the usage, you should read the manual & precautions carefully and use it properly. You should follow next procedures and warnings about the battery & other components to prevent any fire, injury, or damage to human body.

WARNING for Safety:

1. Do not heat the product with microwave machine or oven.
2. Do not dispose the battery into a fire.
3. Do not make direct connection between '+' and '-' of the battery terminal (both edge of battery) simultaneously by the conductor (any metallic object, coin, or clip) which will cause the short-circuit to occur fire or injury to human body. Thus the charged battery should be handled with care.
4. The product is not waterproof (Ordinary equipment, IPX0), so avoid the humidity and water.
5. Do not use in the presence of a flammable anaesthetic mixture with air, oxygen, or nitrous oxide.

WARNING for Power Unit:

1. Do not use any undesignated charger by Xenosys. If any damage or unexpected hazard happens by the usage of undesignated charger, the manufacturer is free from the responsibility.
2. In case of any oil spillage or liquid to inside of the product may cause fire or electric shock. Then turn off the power immediately and disconnect the power cord.
3. Do not bend or twist the power cord excessively. It may cause fire or electric shock.
4. Do not touch the power cord with wet hand which may cause electric shock or equipment damage.
5. Do not use L2S14C with connecting directly to the battery pack during the operation or medical practice.

 **WARNING for Main Body:**

1. Never disassemble or undertake modification of the equipment.
2. Do not put any metal or flammable object into the main body. It may cause fire or electric shock.
3. Any drop or hard shock may cause the potential damage to the equipment.
4. Do not use or store the equipment in the area where get the direct ray of light, humidity, dust or soot.
5. Clean up with a dry and soft cloth.
6. Do not use the detergent or chemical fluid to clean which may cause discoloration.
7. Avoid the reach of children or pets.
8. Maintain the following conditions for storing the product.

Environment for Storage & Transportation	
Ambient Temperature	6°C ~ 40°C (43°F ~ 104°F)
Relative Humidity	30% ~ 85% @ 6°C ~ 40°C (43°F ~ 104°F)
Pressure	860 hPa ~ 1060 hPa

 **WARNING for LED Lens Module:**

1. Do not drop, crush, or put a high pressure on LED lens module.
2. Clean LED lens surface with dipped alcohol or methanol in dry cloth softly.
3. Do not bend or twist the connection cable between the main body and LED lens module which may cause the defective.
4. LED optic outside emits heat, so be careful on touching.
5. Do not look directly into LED lens module or some one's eyes to avoid the risk of permanent eye damage.

RISK GROUP 2

CAUTION Possibly hazardous optical radiation emitted from this product.
Do not stare at operating lamp. Maybe harmful to the eyes.

 **WARNING for Battery:**

1. At the first installation, make sure to check the external figure of battery. If there is any spill, swollen, stink, or unusual found, then do not use the product and contact the dealer. If it's normal, then charge the battery fully and use it.
2. The battery is lithium-ion rechargeable one.
3. When transporting only battery, make sure to keep it in soft case. Do not make any conductor to connect the battery charging point.
4. The battery operating time may shorten using in the cold place (below -10°C) even fully charged one. In that case, warm up the battery within the pocket before using L2S14C. Do not heat up the battery with microwave or any heater.
5. Use only the charger which is provided by Xenosys.
6. Charge battery in the range of $+10^{\circ}\text{C} \sim +35^{\circ}\text{C}$. It may take longer to charge the battery out of this temperature range.
7. Provided battery can be charged and discharged about 300 times at room temperature. Lithium-ion battery is expendables, thus if the operating time is shortened after full charge, we recommend exchanging new battery.
8. Be careful on benzene, thinner, alcohol (volatile & flammable fluid) and water. If those chemicals penetrate the battery, it may cause the trouble in circuit and any accident.
9. If there is any swollen battery, spill, emit, or fire, stop using immediately and contact the distributor (dealer) or the manufacturer.
10. Never use any damaged battery and charger.
11. In case of the first installation or unused long time, then charge the battery fully before using.

 **WARNING for Charger Cradle:**

1. Do not connect any metallic objects between the cradle connector and battery. This may cause the defective on the charger and charger cradle.
2. Use only the charger which is provided by Xenosys on the phone jack. This may cause the defective on the charger and charger cradle.

 **WARNING for Disposal:**

1. In case of careless disposal, it may pollute the environment, so make sure to separate collection.

FEATURES

1. Operating Principle

L2S14C adopts the way to deliver DC voltage from the battery to LED device through STEP-Down circuit and generate light speed through the lens. Even though battery voltage is reduced, L2S14C allows LED to provide consistent brightness.

2. Electrical Rating

LED Control Unit: DC 3.7V  500mA (: This means Direct Current)

Charger: Single-phase 100–240VAC, 50–60Hz

3. Protection Classification & Type against Electric Short

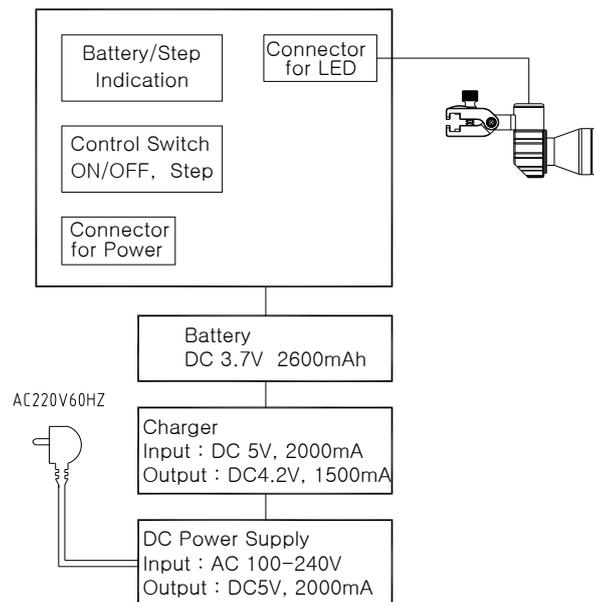
1) Protection Classification:

- ① Battery operated equipment
- ② Charger, Charger Cradle: Class II device

2) Protection Type: N/A

4. Safety Circuit: L2S14C contains Latching Power Switch circuit and protection circuit for overcurrent & overvoltage to keep the charging quantity.

5. Block Diagram: Refer to below figure.



COMPONENTS

1. Basic Components



④ Battery (2 EA)



⑤ Charger (LCH14)



⑥ DC Power Supply (BPM010S05)



⑦ Power Cord

2. Optional



⑧ Anti-curing Filter
(Only for LLM1474, LLM1482)



⑨ LED Lens Module (LLM1474)



⑩ LED Lens Module (LLM1466)



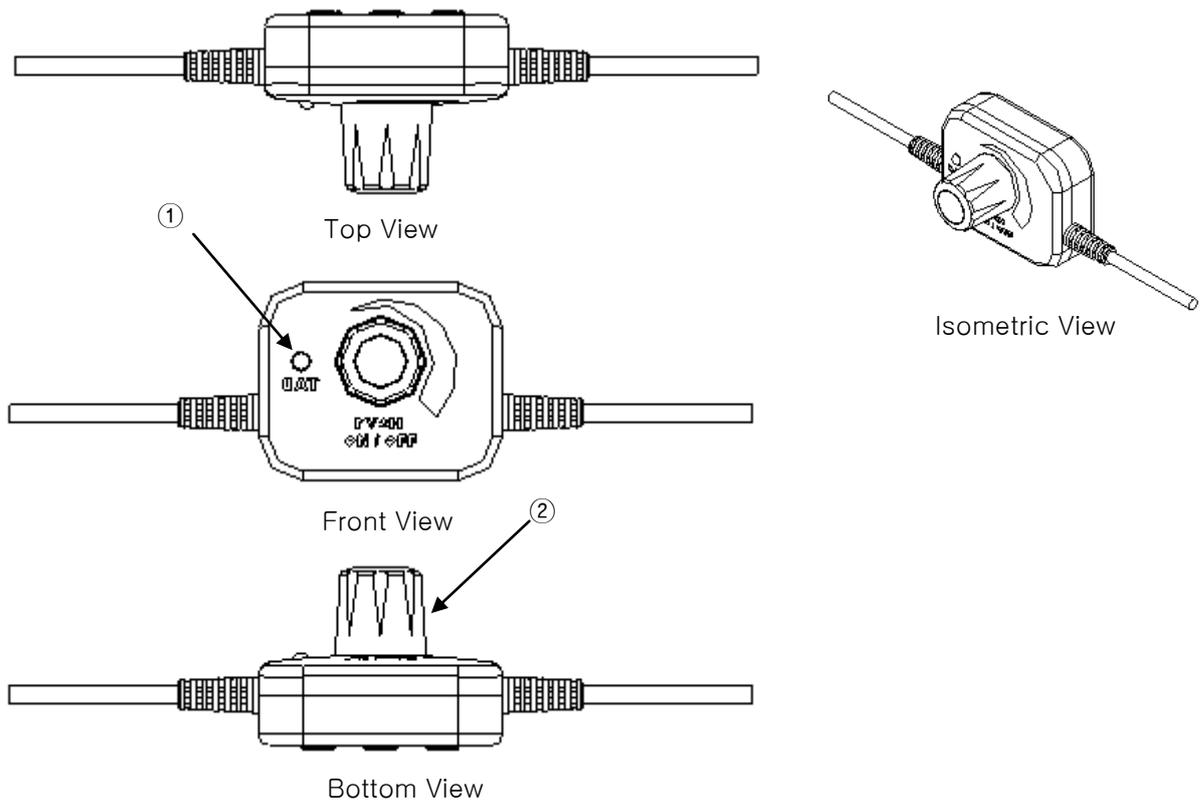
⑪ Headband Cloth Pad
(Expendables)

3. List of Components

No.	Components	Main function & Page	Qty.	Reference
①	Control Unit	Refer to 9	1	
②	Battery Pack	Refer to 10	1	
③	Battery	Refer to 11	2	Expendables
④	LED Lens Module (LLM1482)	Refer to 11	1	
⑤	Charger Cradle	Refer to 12	1	
⑥	Charger	Refer to 12	1	
⑦	Power Cord	-	1	
⑧	Anti-curing Filter	Anti-curing for photo polymerization(Only for LLM1482 & 74)	1	Optional
⑨	LED Lens Module (LLM1474)	Field of View: Ø74 mm @WD400mm	1	Optional
⑩	LED Lens Module (LLM1466)	Field of View: Ø66 mm @WD400mm	1	Optional
⑪	Headband Cloth Pad	Expendables (2 kind / 3 pieces for 1set)	3	Optional

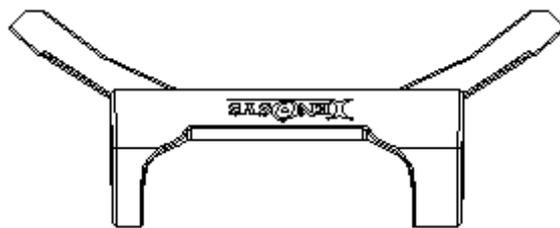
FUNCTIONS

1. Main Body (Control Unit)

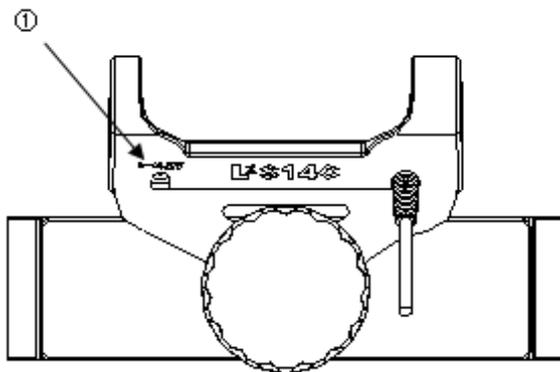


- ① Battery Alarm: Show the battery remaining sign
- ② Power ON/OFF button & Intensity change knob:
 - Press the button to turn on or off LED lens module.
 - Turn left or right, then the beep sound comes to change the desired light intensity. There is no beep sound when it reaches to minimum or maximum level.
 - Turn right side for brighter level and turn left for dimmer level.

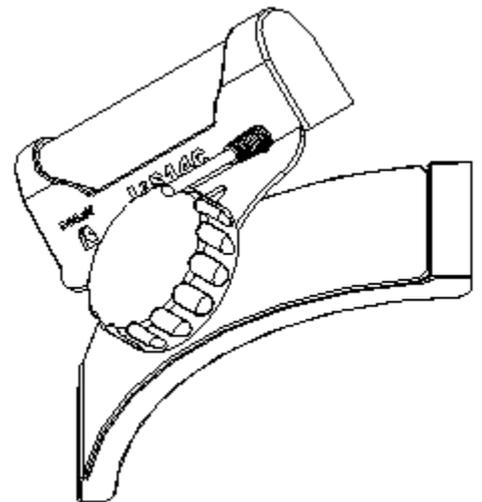
2. Battery Pack



Top View



Front View

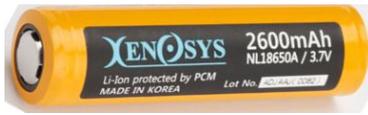


Isometric View

- ① Ø3.5 DC4.2V Input phone jack: Connect the phone plug of the charger directly to the battery pack to charge the battery.

⚠ Warning – Do not connect ANY OTHER charger with Ø3.5 phone jack; it will cause severe damage to main body. This will be excluded from the under warranty and get charged.

3. Battery



- ① Battery: 3.7V / 2600mAh Li-ion

 **Warning** – Read the warning for battery from page 5 to 6 before usage.

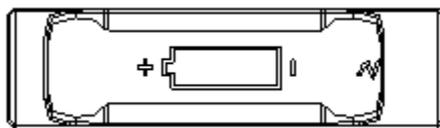
4. LED Lens Module



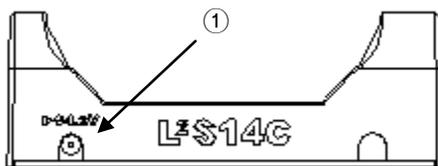
- ① Adjustable link: LED Lens module can move up-down, and left-right side.
- ② 3 types of LED Lens Module available (Choose one)

Class	Type	Feature (Field of View)	Reference
Standard	LLM1482	Ø82mm@WD400mm	Basic
Option 1	LLM1474	Ø74mm@WD400mm	
Option 2	LLM1466	Ø66mm@WD400mm	

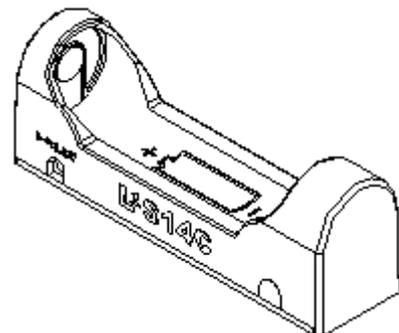
5. Charger (LCH14)



Top View



Front View



Isometric View

① DC5V connection jack: The phone jack which is connected to the plug of DC power supply.

⚠ Warning – Do not use non-Xenosys supplied power supply. This will cause severe damage to the cradle & main body which is also excluded from the under warranty and get charged.

6. DC Power Supply



① Charging Plug: Provide the power to DC5V connection jack of the charger.

⚠ Warning – Do not use any other device randomly which may cause the defective reason. In case of using non-Xenosys-supplied charger with higher voltage (over 5V), the main unit will shut down the power supply and stop the all operation after “beep” sound. It is a security circuit to protect L2S14C from the over-voltage. Please check if its Xenosys supplied charger and the serial number. If it’s Xenosys supplied one, then stop using and contact the distributor (dealer) or the manufacturer. If not, make sure to use Xenosys DC5V power supply.

OPERATING INSTRUCTION

A. Preparation before usage

1. Check components

Components are shown on page 8~9. They can differ from the picture and replace or delete with new parts for better performance.

2. Charging

The battery is not completely charged on delivery, so charge the battery fully before the first-time usage.

- ① Provide the power after connecting the charger to the cradle.
- ② Once the battery is fully charged, the charging signal LED of the charger turn to “green”.

B. Operating Instructions

1. Remove the protection cap of LED lens module, and wear the headband by adjusting both knobs in upper & rear side to fit your head.
2. Press the power ON/OFF button to turn LED on, and adjust the light position to fit the user.
3. Turn the intensity change knob to set the brightness. Turn right will increase and turn left decrease the intensity.

C. Maintenance & Storage after use

1. If the usage is done, press the power ON/OFF button to turn off. Then store it to the case.

 **Caution – When no-use for long time, make sure to remove the battery from the battery pack.**

2. Store LED light in the place free from the air with pressure, temperature, humidity, wind, ray of light, dirt, salinity, and ion.
3. Store L2S14C in the place free from the declination, shack, and shock.
4. Store L2S14C in the place free from gas, smoke, and chemical fluid.
5. Clean up & wash for next time use.

 **Caution – External can be cleaned with soft cloth. In case of heavy pollution, try with a bit of neutral detergent and make sure to NO water or electrolyte flow into the main body.**

6. In case of malfunctioning, stop using immediately and contact the dealer.
7. Do not disassemble, repair, or modify the equipment by unauthorized personnel.

 **Caution– Unauthorized disassemble, repair, or modification are out of warranty.**

8. The way to maintain the battery lifespan longer is to exchange fully charged battery before “beep” sound and the battery alarm sign, and recharge the used battery.

D. Turn on light & Intensity change



1. Press the power ON/OFF button of the control unit to turn on.
 - ① Check the light comes from LED lens module.
 - ② Check the battery alarm LED. (LED shows the remaining time of the battery)
 - ③ If fully charged battery is installed, battery alarm LED shows Green. During the battery is running out, it shows in the turn of Green→Orange→Red→blinking Red. We recommend changing battery when hearing 3 times “beep” sound and “blinking Red”. After 2 to 5 minutes of “blinking Red” sign, the power will shut down automatically.

⚠ Caution – Please exchange with fully charged battery or recharge when hearing “beep” sound and only a few moments light come which means the battery is not charged.

2. Turn the intensity change knob and there will “beep” sound come to change desired brightness level. There is no “beep” sound when it reaches to minimum or maximum level. Turn right side for brighter level and turn left for dimmer level.

Brightness		Type			Operating Time (hr)
		LLM1482	LLM1474	LLM1466	
Brightness (lx) @WD400mm	Min.	4,000	5,000	6,000	More than 27
	Max.	22,000	25,000	32,000	More than 4

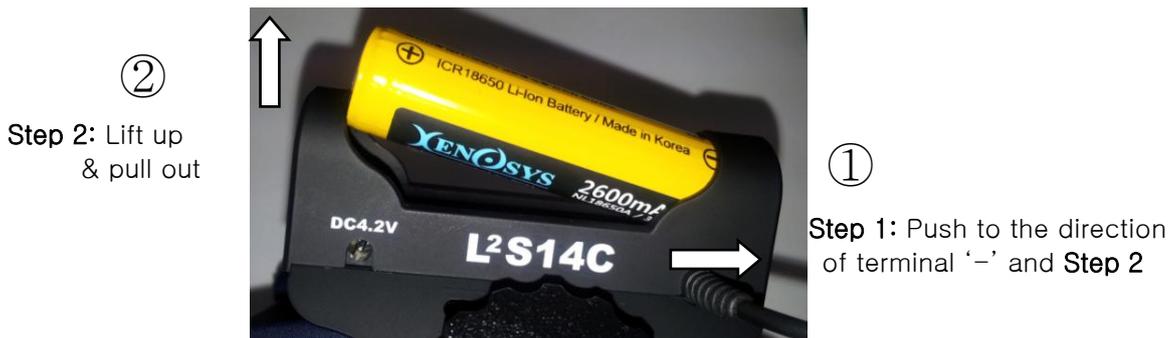
3. Adjust LED lens module up–down or left–right to locate the desired position. External LED lens module’s temperature will go up to 42°C (max.) during usage, so be careful.
4. After finishing the usage, press the power ON/OFF button to turn off.

E. How to exchange battery

1. Prepare fully charged battery.



2. Remove the battery: To remove the used battery, grab it with hand and push to the direction of '-' terminal. Lift up the battery of '+' terminal at the same time to pull out.



3. Install new battery: To install the fully charged battery, grab it with hand and push to the direction of '-' terminal. Push to the battery of '+' terminal to the bottom of the cradle.



4. Check the battery installation: Turn the battery to check the exchange. (Finish exchanging)



F. Wearing Headband



1. Wear the headband and adjust ① Depth of head adjustment knob to locate it in the middle of forehead.
2. Adjust ② Head diameter adjustment knob to fix the headband in stable.
3. Move ③ Height adjustment bar which is installed LED lens module to fit.
4. Adjust the right position to see the surgery or wound spot properly.





 **Warning**

1. In case of ① Depth of head adjustment knob or ② Head diameter adjustment knob operating is loose, remove the cloth pad first. Then use the screw driver to lock the clockwise direction of (+) screw which is inside of headband (the opposite side of the knob) and loose the screw up to 0.5 ~ 1 pitch to counterclockwise direction to maintain proper operation.
2. Headband cloth pad is expendables. We recommend changing them in case of too much pollution. (Optional)

BASIC TROUBLESHOOTING

Symptom	Check Point	Troubleshooting
No light comes from LED lens module	Check the battery terminal is located at the right position of the battery pack.	Relocate the battery position
	Check if the battery is discharged	Charge the battery & use
	Check if the cable connection is properly installed.	Contact the distributor or manufacturer
Light comes on a few moments and turn off	Check the battery remaining quantity	Recharge the battery
After exchange of battery, the light intensity is not enough	Check the intensity level is changed correctly	Change the intensity level properly
Discharging time is too fast	Check if the battery is fully charged. (Check the battery alarm LED)	If the battery running time is too short even fully charged, we recommend exchanging with new battery as it is expendables.
Light flickers intermittently	Check the cable which is connected to main unit.	Contact the distributor or manufacturer

SPECIFICATIONS

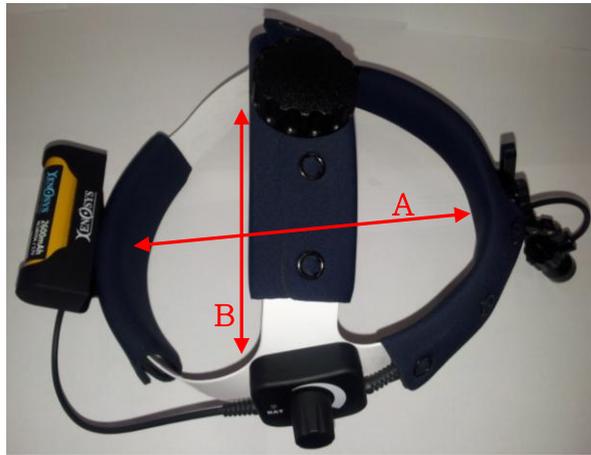
1. Measurement and Weight

A. LED Control Unit, Battery Pack, LED Lens Module

① Size: Variable measurement

Minimum 170mm x 160mm (A x B) ~ Maximum 220mm x 200mm (A x B)

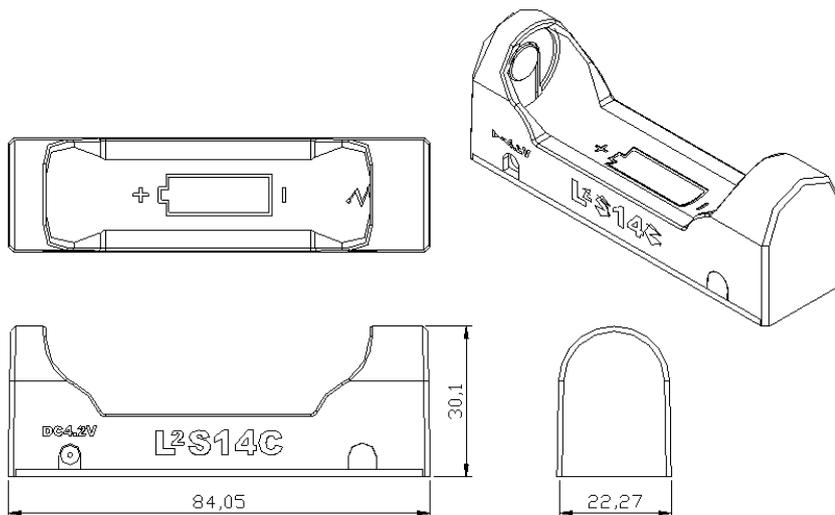
② Weight: 300 g



B. Charger (LCH14)

① Size: Refer to the below photo

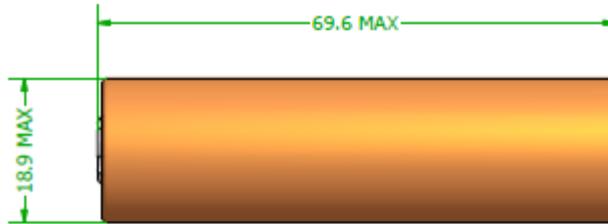
② Weight: 23 g



C. Battery Pack

① Size: Refer to the below

② Weight: 47 g



D. DC Power Supply

① Size: 95(L)x53(W)x33(H) [mm]

② Weight: 176 g



E. Power Cord

① Length: 1.8 m

② Weight: 90 g



2. Details of Specification

Electrical Specification

Input Voltage	▪ DC3.7V 
Operating Power	▪ 2.2W
Operating Time	▪ 27 hours (Minimum brightness) ▪ 3 hours (Maximum brightness), 1482 is 4 hrs.
Charging Time (Full charge)	▪ 3 hours
Power of Charger	▪ Input: DC5V  2A ▪ Output: DC4.2V  1.5A
Power of DC Power Supply	▪ Input: AC100~240V, 50~60Hz, 0.3A ▪ Output: DC5V  2A
Light Source	▪ High Power LED (White Color)

LED Illumination

Brightness (lx) @WD400mm	Type	LLM1482	LLM1474	LLM1466
	Min. Brightness (lx)	4,000	5,000	6,000
	Max. Brightness (lx)	22,000	25,000	32,000
Field of View (mm) @WD400mm		Ø82	Ø74	Ø66
Weight (g)		35.1	32.8	34.2
Color Temperature, Wavelength Range		▪ 6000 K, 400 ~ 700 nm(Visible)		
Uniformity		▪ More than 80% @WD400mm		
LED Operating Power		▪ 1.9 W (max.)		
LED Life Span (Guaranteed Time)		▪ 50,000 hours		

Replacement Components

Battery Pack	▪ DC3.7V  2600mAh Li-ion
DC Power Supply	▪ Input: AC100~240, 50~60Hz, 0.3A ▪ Output: DC5V  2A

Dimension & Weight of Total Package

External Figures	▪ W 410 x H 320 x T 180 (mm)
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Total Weight	▪ 3.50 kg
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ELECTROMAGNETIC COMPATIBILITY

Electromagnetic Compatibility

It is designed to protect the medical equipment from the harmful interruption. This system occur electromagnetic interruption within the acceptable range. And, if it is not installed nor used properly to the direction, it may generate radio wave energy to cause any harmful interruption to some other equipment around. It cannot guarantee that the interruption will not give any influence to specific equipments. When the device is powered on, you can find out if it generates electromagnetic interruption or not.

Recommend to choose one and more ways to solve the trouble in the following ways.

1. Relocate the equipments receiving the interruptive wavelength.
2. Put the each equipment in longer distance.
3. Connect the equipment to the different outlets from the ones connected to other equipments.
4. If you need expert's help, contact to manufacturer or professional distributor.

TRANSPORTATION

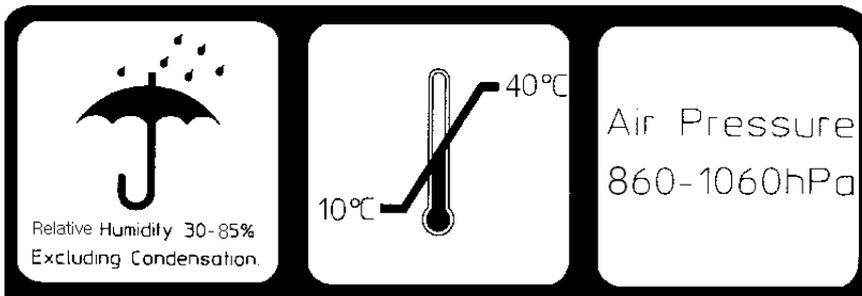
1. To protect L2S14C from any damage in transportation, pack it by plastic bubble wrap or shipping box.
2. Load L2S14C boxes up and down evenly by handcart and any vehicle trunk to transport.
3. When you carry L2S14C by hand, hold it with two hands firmly and disconnect charger, and power cord from the main-body for safe transportation.

STORAGE

1. Maintain the following conditions for storing main products & components.

Environment for Operating & Storage	
Ambient Temperature	6°C ~ 40°C
Relative Humidity	RH30% ~ 85%
Pressure	860 hPa ~ 1060 hPa
Environment for Transportation & Storage (Non-operating)	
Ambient Temperature	10°C ~ 40°C
Relative Humidity	RH30 ~ 85%
Pressure	860 hPa ~ 1060 hPa

- External box marking will be as follows.



2. Do not pull out, twist, nor bend excessively the power cord.
3. Wind up the power cord loosely, and store it by using the rubber bandage or cable tie.
4. Do not expose the main body to excessive shock, direct ray of light and high temperature which may cause the defective reason.
5. Caution for battery storage: As Li-ion battery is small-sized with high power, if it is stored fully charged condition for a long time, the battery lifespan can be reduced.
 - ① Store it under half-charged condition in case of non-use immediately.
 - ② Store the battery with separated from the main body in case of long-time no use.
 - ③ Recommend to keep it in the dry condition with ambient temperature range of +15°C ~ +25°C. Keep away from too hot or extremely cold places.

CLEANING INSTRUCTION

1. Clean up LED lens module surface by soft cloth with neutral detergent regularly to remove dirt, and leave it dry for usage.
2. Do not use volatile chemicals like benzene, alcohol, thinner, and acetone for cleaning. If there is any contact of these chemicals to the surface, clean it by soft cloth dipped with neutral detergent. However, the manufacturer is not responsible for any defect caused by these chemicals.
3. Do not expose the equipment to the sterilizing or cleaning process with excessive temperature and humidity. In case of the exposure, it will cause the damage to the equipment and out of warranty. Especially, inside parts of the main body do not allow the contact of any liquid.

SERVICE & WARRANTY

1. This service & warranty statement applies to all countries to the extent that there is no special warranty rule.
2. All services & warranty should be provided by Xenosys Co., Ltd. or authorized personnel by Xenosys Co., Ltd.
3. Warranty becomes effective from the sales date for material, production defective, or defect under the normal use. Thus the warranty period starts from the first purchaser's sales date. Warranty will not be applied for abuse, improper use, negligence, improper installation, and operation or any remodeling, adjustment and modification by unauthorized personnel or technician. Refer to the warranty period in line #12.
4. Exchanged or any broken part after repair become to the property of Xenosys Co., Ltd.
5. There is no extended or renewed warranty period after the repair or replacement is done.
6. No warranty will be applied in case of the modification or personalized part by customer's request.
7. No warranty will be applied in case of no serial number or hard to detect the proper one.

8. Changes in this limited warranty require the previous approval from Xenosys Co., Ltd.
9. If there is any defect happens which cannot be handled by troubleshooting in this manual, return it to the manufacturer. Then Xenosys will take care of it. If the qualified engineer determines that the defect comes from the abuse or improper use, warranty will not be applied. The repair cost shall be notified prior to the service & repair work starts.
10. Before sending the equipment need for repair, contact the manufacturer or distributor. Then the manufacturer or distributor will report details with RMA No. and related reference which will make easier to track.
11. There are no user serviceable parts in this product. Please send the product to the distributor (dealer) for servicing. Technical description or manual is available upon request.
12. Warranty Period of L2S14C
 - 1) L2S14C (except the battery): 1 year
 - 2) Battery: 6 months

EU Representative (EU Repräsentant)

1. Company: Cormedics Medizintechnik GmbH
2. Address: Bahnhofstr. 32, 82041 Deisenhofen, Germany
3. Tel (Fon): +49 (0)89 666 58 79 15
4. Fax: +49 (0)89 54 999 030
5. E-mail: a.huettl@cormedics.com
6. Web: <http://www.cormedics.com>



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