Portable Electro-Stimulation Therapy Device

USER MANUAL

LGT-235

Guangzhou Longest Science & Technology Co., Ltd.

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Foreword

Thank you for purchasing the ***LGT-235 Portable Electro-Stimulation Therapy Device*** *from our company.*

This manual has been written for the owners and operators of the ***LGT-235 Portable Electro-Stimulation Therapy Device****. It contains general information on the instructions for safety, intended use, working principle, operation, maintenance, troubleshooting, and warranty. In order to maximize the use, efficiency, and working life of your unit, please read this manual thoroughly and become familiar with the controls, as well as the accessories, before operating the unit.*

Specifications put fifth in this manual were in effect at the time of publication. However, owing to policy of continual improvement by Guangzhou Longest Science & Technology Co., Ltd., any changes to these specifications may be made at any time without obligation on the part of Guangzhou Longest Science & Technology Co., Ltd.

Before administering any treatment to a patient, the user of this equipment should read, understand, and follow the information contained in this manual for each mode of treatment available, as well as the indications, contraindications, warnings, and precautions.

Product Description

*The **LGT-235 Portable Electro-Stimulation Therapy Device** is a lightweight and portable multifunctional electrotherapy device that provides TENS current, or MCR current.*

It utilizes the low electric-current to stimulate muscle nerve to stimulate nerve and muscle tissue, relieve pain and promote blood circulation, help improve symptoms, relieve pain, restore and strengthen neuromuscular function.

Safety Instructions

Symbols

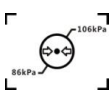
1. Symbols on the medical device

Symbols	*Explanation*
	*Manufacturer*
	*Date of manufacture*
EC REP	*EU Representative*
CE 0598	*This product complies with European Directive 93/42 EEC for medical products. (0598 is the notified body number)*
	*Correct Disposal of This Product (Waste Electrical & Electronic Equipment) Statement: Contact the local authorities to determine the proper method of disposal of potentially bio-hazardous parts and accessories.*

	*Type BF applied part (i.e. electrode, knee pad for electrotherapy) complying with IEC60601-1.*
IP22	*Protected against solid foreign objects of 12.5 mm (0.5 in) diameter and greater;* *Protected against vertically falling water drops when enclosure tilted up to 15° .*
	*This device emits non-ionizing radiation.*
	*Refer to instruction manual/ booklet*
	*Caution output. It is placed near all electrode connections.*

2. Symbols on the package

Symbols	Explanation
	*This side up* *The transportation package must be vertical and straight up during transportation.*

	*Fragile, handle with care* *The product inside the packaging could be easily damaged if dropped or handled without care and attention.*
	*Keep away from rain* *The product package should keep out of the rain and not to store it in damp conditions.*
	*Temperature limitation* *The product package should be stored at a temperature between -20 and 55 degrees (centigrade).*
	*Upper limit of humidity* *The product package should be stored at a humidity less than 93%.*
	*Atmospheric pressure limitation* *The product package should be stored at an atmospheric pressure between 86kPa and 106kPa.*

Precautionary Definitions

The precautionary instructions found in this section and throughout this manual are indicated by specific symbols. Understand these symbols and their definitions before operating this equipment. The definition of these symbols is as follows:

Text with a "CAUTION" indicator will explain possible safety infractions that could have the potential to cause minor to moderate injury or damage to equipment.

Text with a "WARNING" indicator will explain possible safety infractions that will potentially cause serious injury and equipment damage.

Text with a "DANGER" indicator will explain possible safety infractions that are imminently

hazardous situations that would result in death or serious injury.

Explosion Hazard

Text with an "Explosion Hazard" indicator will explain possible safety infractions if this equipment is used in the presence of flammable anesthetics.

Dangerous Voltage

Text with a "Dangerous Voltage" indicator serves to inform the user of possible hazards resulting in the electrical charge delivered to the patient or operator in certain treatment configurations.

Refer to Instruction Manual/Booklet

NOTE: *Throughout this manual, "NOTE" may be found. These Notes are helpful information to aid in the particular area or function being described.*

Warnings and cautions

*Please carefully read and understand the following warnings and cautions to ensure the safe and correct use of the **LGT-235** and to prevent injury.*

- *Read, understand, and practice the precautionary operating instructions. Know the limitations and hazards associated with using the **LGT-235**. Observe the precautionary and operational decals placed on the unit.*
- *Before using **LGT-235** make sure you have read and understood all information provided in this manual. Familiarity with the information included in this manual is an essential requirement to ensure efficient and optimal use of the system, to avoid dangers to persons and to the equipment, and to obtain good treatment results.*
- *Improper installation, operation, or maintenance of the **LGT-235** may result in malfunctions of this unit or other devices.*
- *In case of display failure or other obvious defects, switch the unit off immediately, and notify a certified service technician.*
- *Adjustments or replacement of components may result in the equipment failing to meet the requirements for interference suppression.*

- *This **LGT-235** should be kept out of the reach of children.*
- *Do not use this unit near the heart or chest, above the neck, on the head, around the mouth or on diseased skin.*
- *The placement of the electrodes can be referenced to the reference icon provided by APP, Note that the following parts cannot be placed:*
  a) carotid sinus (current may affect blood pressure and cardiac contraction, causing arrhythmia);
  b) infection site (which may aggravate the infection);
  c) pregnant women's abdomen and lumbosacral (may cause uterine contractions);
  d) surgical site (muscle contraction may cause wound dehiscence);
  e) malignant neoplasms;
  f) sensory defects or parts that are allergic to the electrodes;
  g) eye.
- *Do not use this unit for purposes other than treatment indicated in this manual;*
- *Do not use the **LGT-235** with high frequency surgical equipments on the patient. It will cause unstable output when the unit is close to the high frequency equipments (in the same room and without shield).*
- *Do not use electrodes with an active area of less than 25 cm² (when you choose the TENS mode) due to the risk of associated burning. Proceed systematically with caution when the*

density of the current is over 2 mA/ cm².

- *Do not modify this device without authorization of the manufacturer.*
- *Only use this device with the charger, cables, electrodes and accessories recommended by the manufacturer.*
- *The **LGT-235** contains built-in batteries that cannot be removed by the user. Do not replace it by yourself to avoid damage the batteries or device. If necessary, please contact the company or the company authorized maintenance personnel to replace.*
- *Do not use this device simultaneously with other therapeutic device (such as microwave), to avoid mis-operation.*
- *Please dispose of the equipment and other accessories according to local regulations. Do not treat them as household waste. Do not put the device in fire or water. If the batteries are not properly disposed, it may cause a battery explosion.*
- *Do not use when the unit is charging.*

CAUTION

- *Always check the device and the electrodes for damage before use.*
- *If the unit is not functioning properly or you feel discomfort, immediately stop using the unit. If you feel any trouble with your body or skin, consult the doctor and follow his/her instructions.*
- *The self-adhesive electrode limited to the same person to use, do not use in another patients*

to prevent infection.

- *If the electrode loses viscosity, please replace the electrode in order to maintain good electrical properties.*
- *Do not use this unit in places with high humidity such as the bathrooms or while taking a bath or shower.*
- *Do not use this unit while sleeping. The main unit may develop trouble, or the pad may move to an unexpected region and cause ill health.*
- *Clean the device using a dry soft cloth. Do not use cleaning solvents or other chemical substances in order to avoid any damage.*
- *Make sure that you end the treatment by switching off the units or by setting the intensity to 0 mA before you remove the units or the electrodes. If you do not end the treatment, you may experience an unpleasant sensation in your fingers. This sensation is not harmful, but can be unpleasant.*
- *Handle the unit with care. Do not drop, knock, or shake the unit. Rough handling can damage internal circuit boards.*
- *Do not apply stimulation while driving, operating machines or while performing any other activity in which electrical stimulation can put you at risk of injury.*
- *Always disconnect the power charger from the mains after use.*

FCC

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation.

If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

-- Reorient or relocate the receiving antenna.

-- Increase the separation between the equipment and receiver.

-- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

-- Consult the dealer or an experienced radio/TV technician for help.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

FCC RF warning statement: The device has been evaluated to meet general RF exposure requirement. The device can be used in portable exposure condition without restriction.

This device and its antenna(s) must not be co-located or operation in conjunction with any other antenna or transmitter.

FCC ID: 2ANHPLGT-235

EMC Guidance

This product needs special precautions regarding EMC and needs to be installed and put into service according to the EMC information provided, and this unit can be affected by portable and mobile RF communications equipment.

CAUTION

- *Do not use a mobile phone or other devices that emit electromagnetic fields, near the unit. This may result in incorrect operation of the unit.*
- *This unit has been thoroughly tested and inspected to assure proper performance and operation!*
- *This machine should not be used adjacent to or stacked with other equipment and that if adjacent or stacked use is necessary, this machine should be observed to verify normal operation in the configuration in which it will be used.*

Accessory Information:

Item	Cable Length	Manufacturer & Address
Power cord (adapter)	0.13 m	Shenzhen Hongyi Electronic Technology Co., Ltd. A05-1, 2/F, 3 Bldg, EC building, Yu Anju, Baoan District, Shenzhen, China
Electrode lead hose	1.2 m	Guangzhou Longest Science & Technology Co., Ltd. 5&6F, Building B4, No.11, Kaiyuan Avenue, Science City, Guangzhou Hi-tech Industrial Development Zone, 510530 Guangzhou, Guangdong Province, P.R. China

Bluetooth Specifications:
Bluetooth version: 4.0
Frequency Range: 2.402GHz ~ 2.480GHz
Output Power: 1mW

Guidance and manufacture's declaration – electromagnetic emission		
The LGT-235 is intended for use in the electromagnetic environment specified below. The customer of the user of the LGT-235 should assure that it is used in such an environment.		
Emission test	**Compliance**	**Electromagnetic environment – guidance**
RF emissions CISPR 11	Group 1	The LGT-235 use 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 emission CISPR 11	Class B	The LGT-235 is suitable for use in all establishments, including domestic establishments and those directly connected to the public low-voltage pump supply network that supplies buildings used for domestic purposes.
Harmonic emissions IEC 61000-3-2	Class A	
Voltage fluctuations/ flicker emissions IEC 61000-3-3	Complies	

Guidance and manufacture's declaration – electromagnetic immunity			
The LGT-235 is intended for use in the electromagnetic environment specified below. The customer or the user of LGT-235 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 floor 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	±2kV for power supply 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 differential mode	Mains power quality should be that of a typical commercial or hospital environment.
Voltage dips, short interruptions and voltage	<5% U_T (>95% dip in U_T) for 0.5 cycle 40% U_T (60% dip in	<5% U_T (>95% dip in U_T) for 0.5 cycle 40% U_T (60% dip in	Mains power quality should be that of a typical commercial or hospital environment. If the user of the LGT-235 requires

variations on power supply input lines IEC 61000-4-11	U_T) for 5 cycles 70% U_T (30% dip in U_T) for 25 cycles <5% U_T (>95% dip in U_T) for 5 sec	U_T) for 5 cycles 70% U_T (30% dip in U_T) for 25 cycles <5% U_T (>95% dip in U_T) for 5 sec	continued operation during power mains interruptions, it is recommended that the LGT-235 be powered from an uninterruptible power supply or a battery.
Power frequency (50Hz/60Hz) magnetic field IEC 61000-4-8	3 A/m	3 A/m	Power frequency magnetic fields should be at levels characteristic of a typical location in a typical commercial or hospital environment.
NOTE U_T is the a.c. mains voltage prior to application of the test level.			

Guidance and manufacture's declaration – electromagnetic immunity			
The LGT-235 is intended for use in the electromagnetic environment specified below. The customer or the user of the LGT-235 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 the LGT-235, 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 metres (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] Interference may occur in the vicinity of equipment marked with the following symbol: 

NOTE 1 At 80 MHz and 800 MHz, the higher frequency range applies.

NOTE 2 These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.

a Field strengths from fixed transmitters, such as base stations for radio (cellular/cordless) telephones and land mobile radios, amateur radio, AM and FM radio broadcast and TV broadcast cannot be predicted theoretically with accuracy. To assess the electromagnetic environment due to fixed RF transmitters, an electromagnetic site survey should be considered. If the measured field strength in the location in which the LGT-235 is used exceeds the applicable RF compliance level above, the LGT-235 should be observed to verify normal operation. If abnormal performance is observed, additional measures may be necessary, such as re-orienting or relocating the LGT-31.

b Over the frequency range 150 kHz to 80 MHz, field strengths should be less than 3 V/m.

Recommended separation distances between portable and mobile RF communications equipment and the LGT-235

The LGT-235 is intended for use in an electromagnetic environment in which radiated RF disturbances are controlled. The customer or the user of the LGT-235 can help prevent electromagnetic interference by maintaining a minimum distance between portable and mobile RF communications equipment (transmitters) and the LGT-235 as recommended below, according to the maximum output power of the communications equipment.

Rated maximum output power of transmitter (W)	**Separation distance according to frequency of transmitter (m)**		
	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

For transmitters rated at a maximum output power not listed above, the recommended separation distance d in metres (m) can be estimated using the equation applicable to the frequency of the transmitter, where P is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer.

NOTE 1 At 80MHz and 800MHz, the separation distance for the higher frequency range applies.

NOTE 2 These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.

Clinical Instructions

*Before a treatment with the **LGT-235 Portable Electro-Stimulation Therapy Device**, a correct examination and diagnosis should be performed.*

Indications

The LGT-235 Portable Electro-Stimulation Therapy Device can alleviate acute and chronic pain, also can stimulate nerves and muscles, causing muscle contraction.

Contraindications

Patients with the following disease are forbidden to use the LGT-235 Portable Electro-Stimulation Therapy Device:

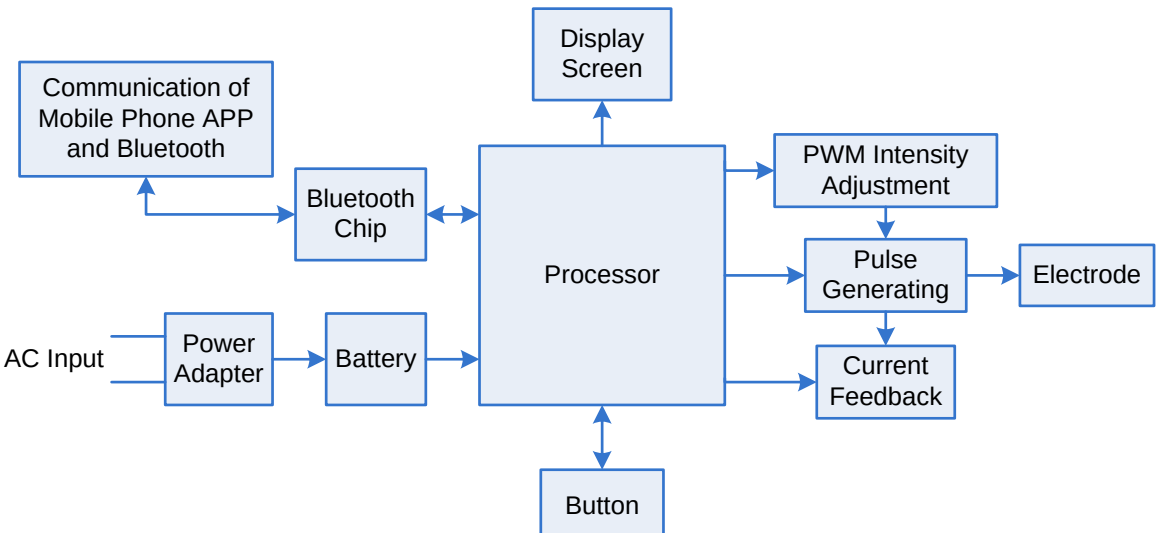
1) *Patient with severe heart failure or arrhythmia, and patient with pacemaker;*
2) *Patient with venous thrombosis or thrombophlebitis;*
3) *Patient who is in the acute or critical stage of important organ disease;*
4) *Patient whose treatment area with bleeding tendency，metal matter or tuberculous lesions;*
5) *Patients who cannot provide sensory feedback for stimulation (unable to express or have difficulty in communication),such as mental disease.*

Adverse Effects

You should stop using the device and consult your doctor if you experience adverse reactions from the device. Possible adverse reactions may include the following:

- *skin irritation beneath the electrodes;*
- *burns beneath the electrodes;*
- *headaches or other painful sensations.*

Working Principle



Inspection of the Goods

1. Unpacking the Unit

The unit is generally delivered with the packaging material supplied by the manufacturer. Proceed as follows:

- *Position the transport packaging so that the arrows are pointing upward.*
- *Remove the transport packaging upward.*
- *Remove the remaining foam material.*

2. Inspections

Immediately upon unpacking the unit, perform the following steps:

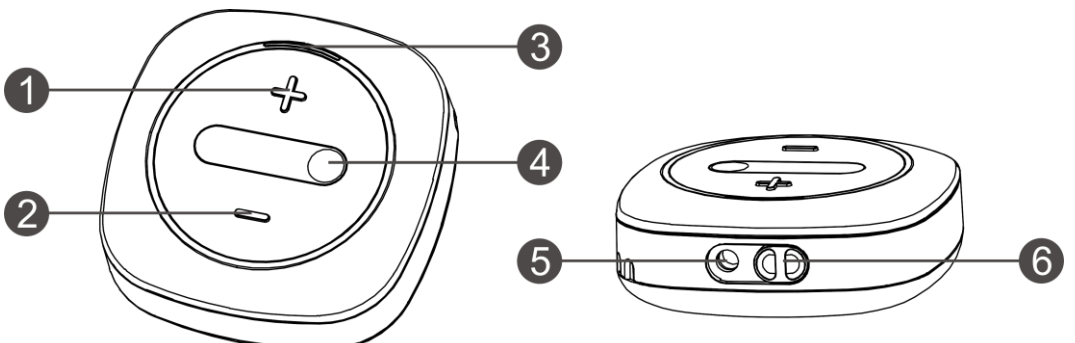
1) *Verify the delivery documents to make sure that the delivery is complete.*
2) *Check the LCD touch screen of the unit when unpack the packaging and make sure it is in good condition. Any scratch on the surface during use will be not covered in the warranty.*
3) *Check the external components and accessories for possible damage due to transport.*
4) *Verify that the packaging contains the following:*

NO.	Item Name	Amounts	Unit
1	**LGT-235** main unit	1	piece
2	Power adapter	1	piece
3	Electrode lead hose	*2*	pieces
4	knee pad for electrotherapy	1	piece
5	Certificate of quality	1	piece
6	Warranty card	1	piece
7	Installation checklist	1	piece
8	User manual	1	piece

*Other parts of **LGT-235** are available as accessory on demand. Visit website **www.longest.cn** to obtain more information.*

Overview of the Unit

1. Nomenclature



1	Increasing intensity button	4	ON/ OFF button
2	Decreasing intensity button	5	Output sockets: connect electrode lead hose
3	Indicator light: see table: meaning of indicator light	6	Micro-USB port: connect power adapter. Slide the slider to output sockets when charging.

Table: meaning of indicator light

Status	Indicator colour	Way of flashing
Power off	None	None
Ready	Green	Flash at 1Hz frequency
Stimulation on	Blue	The flash frequency is consistent with the output pulse frequency
Low battery cannot be used	Yellow	Flash at 3Hz frequency for 1s, and then turn off the unit.
Charging	Yellow	Always bright
Fully charged	Green	Always bright
Electrodes fall off during treatment	Yellow	Flash at 1Hz frequency

2. Accessories

2.1 Electrode lead hose

The electrode lead hose connect with the main unit and electrodes.

2.2 knee pad for electrotherapy

2.3 Optional Accessories

No.	Item name
1	Glove for electrotherapy
2	Sock for electrotherapy
3	Self-adhesive electrode with magnetic connection: 50mm×50mm (square)

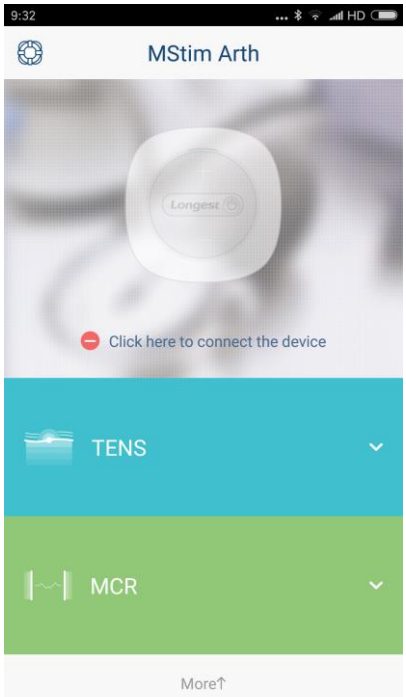
MStim Arth Application

LGT-235 Portable Electro-Stimulation Therapy Device can only be used with the software provided by our company.

- *Name of the software: MStim Arth*
- *Release Version: 1*
- *Software operating environment:*

  Android 4.3 or later mobile phone, with 4.0 Bluetooth.

  iOS 8 or later iPhone mobile phone, with 4.0 Bluetooth.



1. Install MStim Arth Application

Click the MStim Arth Application installation package (APK file) on your phone, and follow the prompts to install the application.

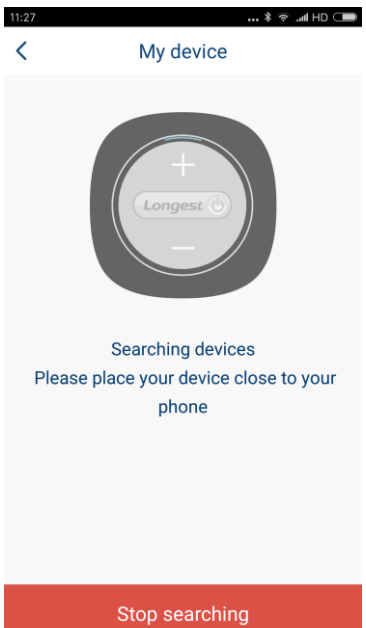
2. Open MStim Arth Application

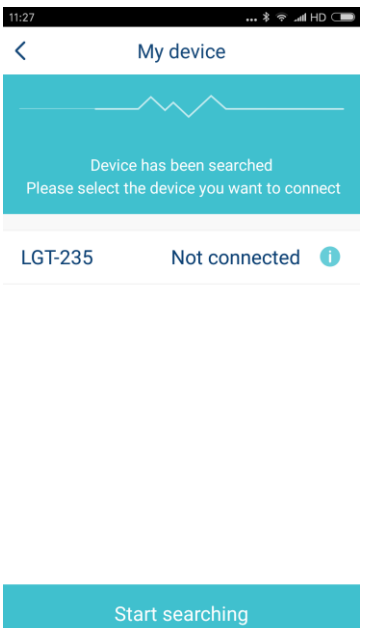
*After the **MStim Arth Application** is installed properly, it will appear* 

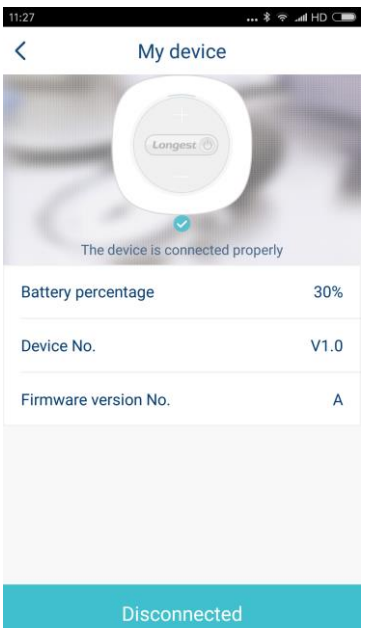
*on your phone desktop. Click the icon and the main interface of the **MStim Arth** appear, as shown on the left.*

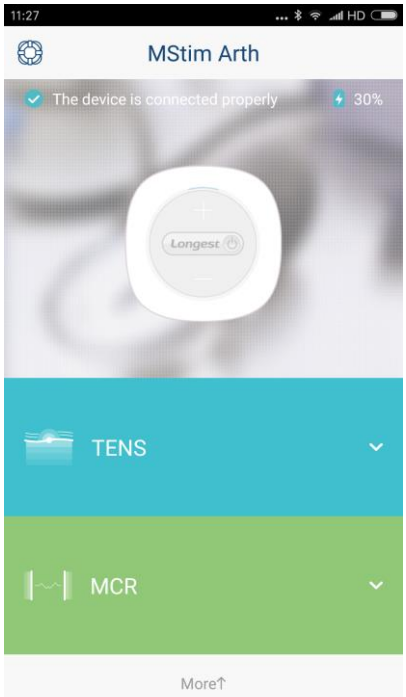
3. Connect the Device

Click “connect the device” to connect MStim Arth Application which on the phone and the device via Bluetooth.





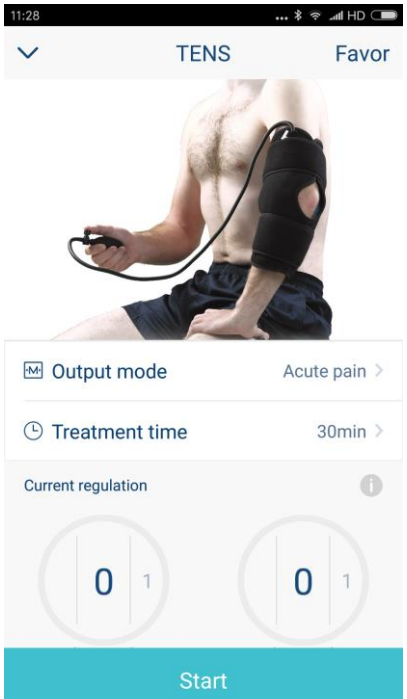




4. Main Interface

*Open **MStim Arth**, you can see the main interface, as shown on the left.*

*There are three modes on the **MStim Arth: TENS Mode, and MCR Mode.***



4.1 TENS Interface

1) *Enter TENS interface*

Click TENS at the main interface to enter the TENS interface, as shown on the left.

2) *Select output channel*

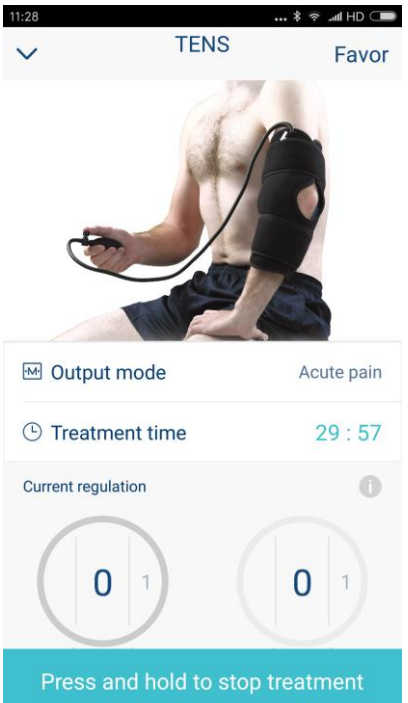
Select single or dual channel outputs as needed.

3) *Choose output mode*

TENS has four output modes: Acute pain, Chronic pain, Arthrocele, and Relaxing Massage.

4) *Set the treatment time*

The treatment time is range from 1-60min, default 30min.

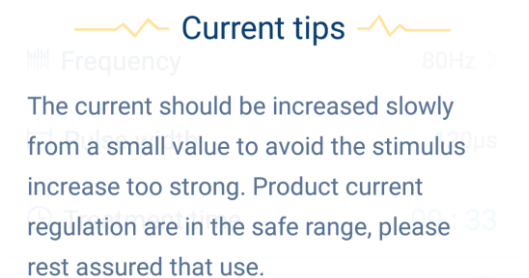


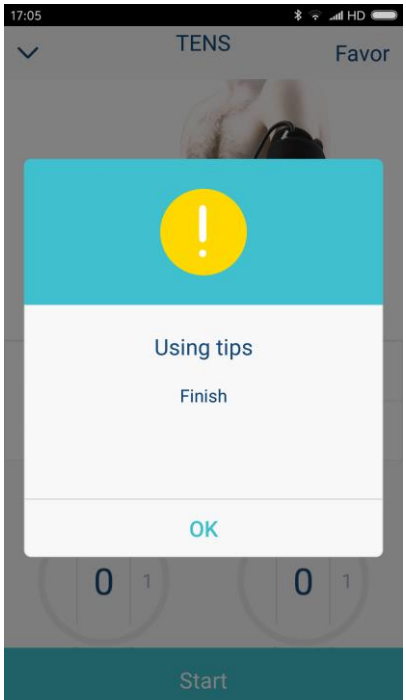
5) Start treatment

When the parameter is set, click the start button to start the treatment.

6) Adjust output intensity

Click the start button, the output intensity can be adjusted. Click *button, interface pop-up tip:*



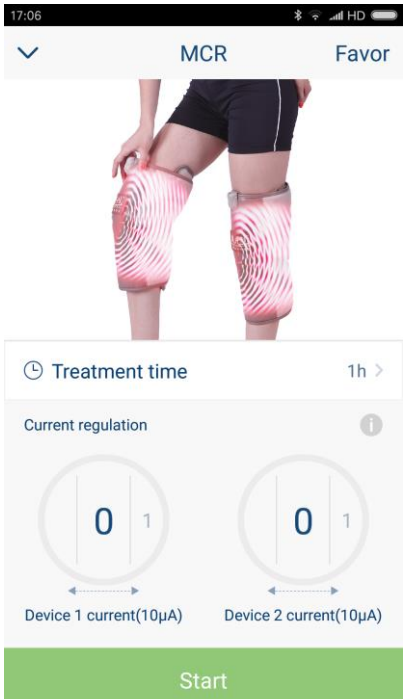


7) locking interface

The APP locks automatically after some time of inactivity to prevent accidental operation. Just press the avatar swipe screen to unlock.

8) End of the treatment

At the end of the treatment, the unit stops output and returns to the pre start state. The indicator is switched from blue to green and flashes at 1Hz frequency, while the mobile application interface shows "the treatment is finish."



4.2 MCR Interface

1) *Enter MCR interface*

Click MCR at the main interface to enter the TENS interface, as shown on the left.

2) *Set the treatment time*

The treatment time is range from 1h-12h, default 1h.

3) *Start treatment*

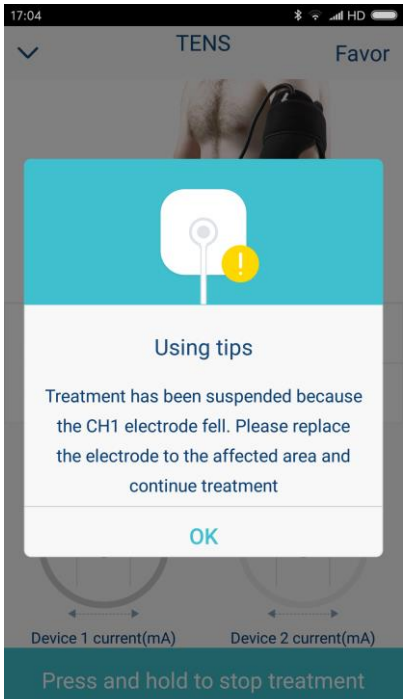
When the parameter is set, click the start button to start the treatment.

4) *Adjust output intensity*

Click the start button, the output intensity can be adjusted.

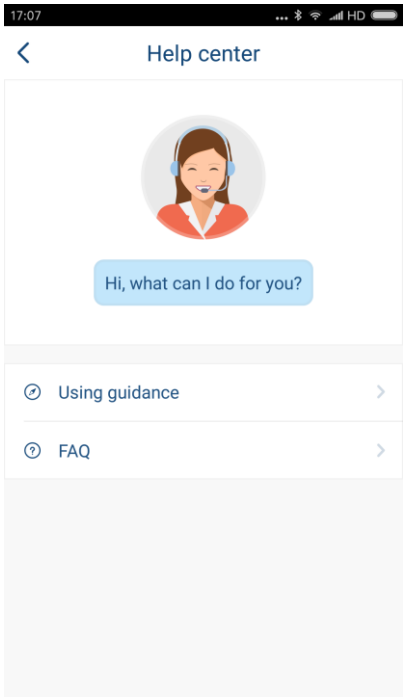
5) *End of the treatment*

At the end of the treatment, the unit stops output and returns to the pre start state. The indicator is switched from blue to green and flashes at 1Hz frequency, while the mobile application interface shows "the treatment is finish."



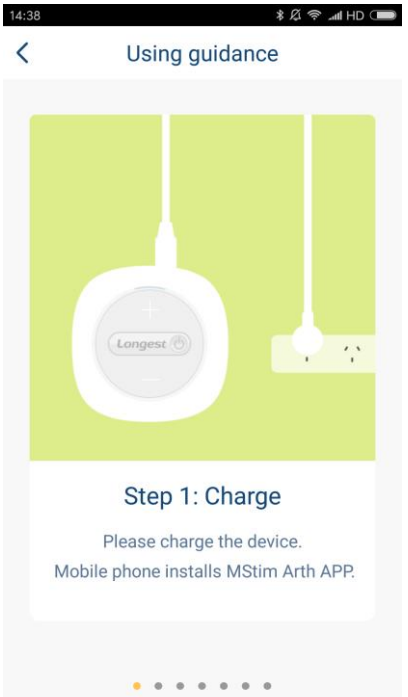
5. Open circuit tip

When the treatment electrode is disconnected, the device appears with the following prompt, please re-paste the electrode.



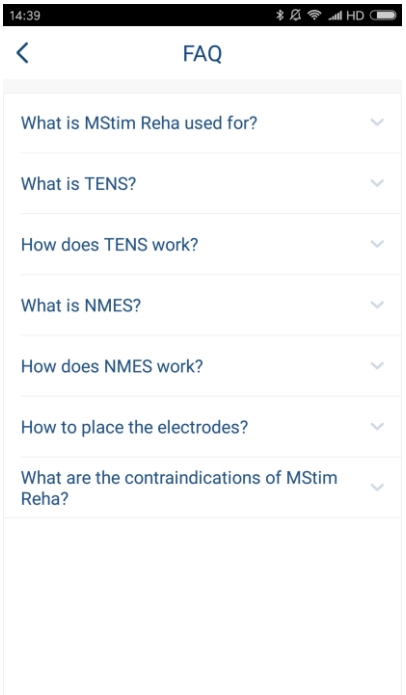
6. Help

Click the icon  *in the upper right corner of the main interface, or slide the interface in the main interface to see more, click the icon*  *, enter the help interface.*



6.1 Using guidance

*There is some introduction of how to operation the **LGT-235 Portable Electro-Stimulation Therapy Device** in using guidance, which is convenient for you to understand the use of device.*



6.2 Common problem

MStim Arth Application *includes a variety of common problems, you can learn more about the* ***LGT-235 Portable Electro-Stimulation Therapy Device*** *and treatment.*

Operation Guidance

1. Preparing for use

1.1 Charging the unit

To be able to use the device, you first have to charge the unit. Put one side of power adapter connects with the unit; another side connects with the power socket. The status indicator on the unit flashes yellow during charging. The status indicator stops flashing turn to green when the battery is fully charged.

NOTE: *If the rechargeable battery of the units is not fully charged when you start a treatment, the batteries may run out during the treatment. We advise you to always fully charge the unit before you start a treatment.*

NOTE: *Always disconnect the power charger from the mains after use.*

Do not use when the unit is charging.

1.2 Turn on the unit

Press the ON/OFF button to turn on the unit to standby.

1.3 Open the MStim Arth and connecting

*Turn on the **MStim Arth Application** on your phone and connect the unit to your phone via Bluetooth.*

1.4 Clean the skin

Use alcohol or soapy water to clean the skin.

1.5 Wear the knee pad for electrotherapy

Wear the knee pad for electrotherapy according the drawing of APP or the actual situation and place the main unit in the knee pad for electrotherapy.

1.6 Connect the unit

Connect one end of electrode lead hose to the electrodes, the other end to the unit.

2. Starting a Treatment

2.1 Parameter Setting

According to the actual situation, choose the appropriate electrical stimulation therapy or protocol, set the treatment parameters, treatment time, etc. (see the chapter MStim Arth Application)

2.2 Press the START button

Click the start button and the treatment begins.

2.3 Adjust output intensity

You can adjust the output intensity in the MStim Arth interface, or through "+/-" button on the unit. The output intensity should be increased slowly from small values to avoid excessive stimulation. Since your body initially adapts to the intensity of the stimulation, you may have to adjust the intensity level after some time to ensure optimal stimulation.

2.4 The End of Treatment

At the end of the treatment, the unit stops output and returns to the pre start state. The indicator is switched from blue to green and flashes at 1Hz frequency, while the mobile application interface shows "the treatment is finish."

Remove the knee pad for electrotherapy and electrode lead hose after treatment. The main unit, electrode lead hose and the knee pad for electrotherapy are put into the box, placed in a cool and ventilated place, ready for the next use.

Care and Maintenance

1. Cleaning

1) *Please turn off the device before the cleaning and disinfection operation;*
2) *For the main unit cleaning, what recommended are a clean, soft damp cloth for stains, and a clean, soft dry cloth for dust in the surface of the main unit;*
3) *Clean the knee pad for electrotherapy: Wipe the surface of the kneecap with a damp cloth or antiseptic wipe after use. It can be washed if necessary: moderate amount of neutral detergent, soak for a short time, be careful, gently rinse and dry naturally. Not machine washable, rubbed and bleached.*

Do not clean the main unit with organic solvent such as gasoline or diluents, otherwise damage will be happened to the main unit such as deformation and falling off of the paint.

2. Routine Maintenance

If it is used in accordance with the instructions of the user manual, the device does not need a particular regular maintenance.

Manufacturer will provide circuit diagrams, component part lists, descriptions, calibration instructions to assist to service personnel in parts repair.

The unit and accessories must be checked at regular intervals.

1) *Check the power line to ensure if there is no distortion, fracture, etc. These circumstances may cause fire hazard. Please replace a new power line immediately.*
2) *Replace the electrodes if:*
   -- they are damaged or torn.
   -- they are past the use-by date.
   -- they have lost their adhesive power. Never use plaster or tape to attach them to your skin.
   -- stimulation feels less strong.
   -- when the stimulation is uncomfortable, i.e. when you experience an unpleasant stinging or biting sensation.

***NOTE**: Always replace the electrodes with electrodes recommended for this device by the manufacturer.*

Never perform unauthorized service work. All service work must be performed only by service technicians who have been authorized by the manufacturer.

3. DISPOSAL

For environmental reasons, do not dispose of the device in the household waste at the end of its useful life. Dispose of the unit at a suitable local collection or recycling point. Dispose of the device in accordance with EC Directive – WEEE (Waste Electrical and Electronic Equipment). If you have any questions, please contact the local authorities responsible for waste disposal.

Troubleshooting

This chapter summarizes the most common problems you could encounter with the LGT-235 Portable Electro-Stimulation Therapy Device. If you are unable to solve the problem with the information below, please call the distributors.

Troubles	Possible causes	Solutions
1. The indicator does not light up at all when press the ON/OFF button	The battery of the unit is empty.	Charge the unit (see chapter Preparing for use').
2. The MStim Arth APP on the mobile phone could not connect with the unit.	1. The unit is not turn on; 2. Mobile phone Bluetooth is not open or mobile phone Bluetooth problems 3. the distance of the mobile phone and the unit is too far; 4. The unit has contacted another mobile. The unit is asleep and Bluetooth is stopped.	1. Turn on the unit; 2. Please turn on the Bluetooth on the mobile phone or change another mobile phone; 3. Please keep the mobile phone near the unit; 4. Disconnect the connected phone or restart the unit; 5. Restart the unit.

Troubles	Possible causes	Solutions
3. The status indicator on the unit flashed Yellow and the unit switched off.	The battery of the unit is empty.	Charge the unit (see chapter Preparing for use').
4. There is not output.	1. Did not press the start button; 2. Did not adjust the output intensity; 3. The electrode lead hose connected badly; 4. The electrode lead hose has been damaged.	1. Press the start button; 2. Adjust the output intensity; 3. Re-connect the electrode lead hose; 4. Replace a new electrode lead hose.
5. Stimulation is uncomfortable.	1. The output intensity is too high; 2. Damaged or worn knee pad for electrotherapy or electrode lead hoses; 3. Electrode active area size is too small.	1. Decrease the output intensity; 2. Replace; 3. Replace electrodes with ones that have an active area no less than 25.0cm^2.

Troubles	Possible causes	Solutions
6. The MStim Arth APP on the mobile phone pop up tips “electrodes fall off”, the indictor of the unit flashed Yellow.	1. The electrode lead hose connected badly; 2. The electrodes are poor contact with the skin. 3. Electrodes do not stick well;	1. Re-connect the electrode lead hose; 2. Re-connect the electrodes. 3. Replace electrodes. Apply electrodes to a clean, dry surface.
7. The unit has output, but treatment without sensation.	The output intensity is too low.	Increase the output intensity.

Technical Specifications

1. Stimulator Output Parameters

1.1 TENS Parameters

<table>
<tr><td>Channels:</td><td>One channel</td></tr>
<tr><td>Output Mode:</td><td>Acute pain, Chronic pain, Arthrocele, and Relaxing Massage</td></tr>
<tr><td>Output Waveform:</td><td>Symmetrical biphasic asynchronous</td></tr>
<tr><td>Pulse Duration:</td><td>
<table>
<tr><th>Mode</th><th>Pulse Duration (μs)</th><th>tolerance</th></tr>
<tr><td>Acute pain</td><td>200</td><td>±20%</td></tr>
<tr><td>Chronic pain</td><td>200</td><td>±20%</td></tr>
<tr><td>Arthrocele</td><td>500</td><td>±20%</td></tr>
<tr><td>Massage</td><td>50</td><td>±20%</td></tr>
</table>
</td></tr>
<tr><td>Pulse Frequency:</td><td>
<table>
<tr><th>Mode</th><th>Pulse Frequency (Hz)</th><th>tolerance</th></tr>
<tr><td>Acute pain</td><td>80-120 (cycle sweeping)</td><td>±1Hz</td></tr>
<tr><td>Chronic pain</td><td>1-20 (cycle sweeping)</td><td>±1Hz</td></tr>
</table>
</td></tr>
</table>

	Arthrocele	60	±1Hz
	Massage	1-120 (random)	±1Hz
Timer:	*1) Treatment time: 1min-60min, stepping 1min;* *2) Timer tolerance: ±2%;* *3) When finish, the device can stop output and prompt.*		
Output intensity:	*Adjustable, 0mA-100mA(p-p), stepping 1mA, ±5mA or ±10% tolerance (at 500Ω load)*		
Maximum Current (r.m.s):	*the maximum current will be limited to 50mA r.m.s.at 500 Ω Load*		

1.2 MCR Parameters

Channels:	*One channel*
Output Waveform:	*Symmetrical biphasic asynchronous*
Pulse Frequency:	*Range from Hz-100Hz (random)*
Pulse Duration:	*50% of Output Cycle, ±10% tolerance*
Timer:	*1) Treatment time: 1h-12h, stepping 1h;* *2) Timer tolerance: ±2%;* 3) *When finish, the device can stop output and prompt.*

Output intensity:	*Adjustable, 0μA -100μA, stepping 10 μA, ±1 mA or ±10% tolerance, take larger values (at 500Ω load)*
Maximum Current (r.m.s):	*the maximum current will be limited to 5mA r.m.s.at 500 Ω Load*

2. Other specifications

Product Name	Portable electro-stimulation therapy device
Model	LGT-235
Power supply:	Adapter model: HYI11-005 Adapter supply voltage: AC100-240V, 50/60Hz; Adapter output: DC 5V, 2A. Battery: 3.7V, 1200mAh, lithium battery. Line Current Isolation: Patient disconnected when charging.
Expected life	● The expected life of the main unit is five years under normal usage. (Except for man-made damage). The Date of product manufacture see label on the device. ● The expected life of the electrode lead hose and knee pad for electrotherapy are 12 months under normal usage. (Except for

	man-made damage). ● Cycle time of electrodes: Usage varies depending on your skin type. We recommend that you keep your skin clean and dry when you use it, usually around 20-30 times.
Rate power :	6VA
Dimension:	59mm (W) × 59mm (L) × 22mm (H)
Weight:	60g (only main unit)
Classification:	● Classification (IEC 60601-1): Class II, Type BF Applied Part; ● Ingress Protection: IP22; ● Mode of operation: Continuous.
Environmental conditions of operation:	● Temperature: 5 to 40℃; ● Rel. humidity: ≤80%; ● Atmosphere Pressure: 86.0 to 106.0kPa.
Environmental conditions of transport and storage:	● Temperature: -20 to 55℃ ● Rel. humidity: ≤93% ● Atmosphere Pressure:86.0 to 106.0kPa
Works with:	Requires a smart phone with Bluetooth 4.0, Android 4.3 (or later) or iOS 8 or later.

Assistance and Spare Parts

Every intervention on device must be performed by manufacturer. For any assistance intervention and original spare parts please contact the manufacturer at following address:

GUANGZHOU LONGEST SCIENCE & TECHNOLOGY CO., LTD.

Add: 5&6F, Building B4, No.11, Kaiyuan Avenue, Science City, Guangzhou Hi-tech Industrial Development Zone, 510530 Guangzhou, Guangdong Province, P.R. China

Tel: +86 20 6635 3999 Fax: +86 20 6635 3920

Email: service@longest.cn Website: www.longest.cn

EU Representatives Information

Lotus Global Co., Ltd

Company address: 1 Four Seasons Terrace West Drayton, Middlesex London, UB7 9GG, United Kingdom

Tel: +44 20 75868010, 70961611 Fax: +44 20 79006187

To preserve product warranty, functionality and product safety we recommend using only original spare parts.

Warranty

*The Manufacturer warrants that the **LGT-235** is free of defects in material and workmanship for the main unit. This warranty shall remain in effect for one year (12 months) from the date of original consumer purchase. If this Product fails to function during the one year warranty period due to a defect in material or workmanship, at the Manufacturer's Option, Manufacturer or the authorized dealer will repair this Product without charge.*

*The users should fill out the Warranty Card as soon as the product is installed and send a copy to **service@longest.cn** to have the warranty be valid. Damages due to non-adherence to the User Manual or wear of parts are excluded from warranty.*

This Warranty Does Not Cover:

- *Replacement parts or labor furnished by anyone other than the Manufacturer, the authorized dealer or a certified Company service technician.*
- *Defects or damage caused by labor furnished by someone other than Manufacturer, the authorized dealer or a certified Company service technician.*
- *Any malfunction or failure in the Product caused by product misuse, including, but not limited to, the failure to provide reasonable and necessary maintenance or any use that is inconsistent with the User Manual.*