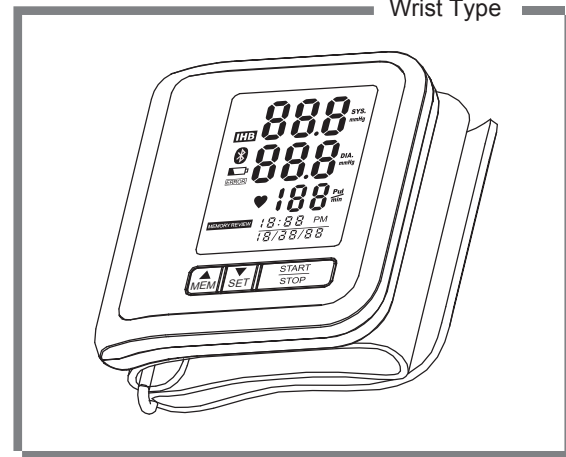


# User Manual


Blood Pressure Monitor LS810-B

Wrist Type



CE0123  Bluetooth® FCC ID: OU9LS810-B01

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Development District, Zhongshan, Guangdong, 528437, China

 MDSS - Medical Device Safety Service GmbH  
Schiffgraben 41, 30175 Hannover, Germany

- Thank you very much for selecting TRANSTEK Blood Pressure Monitor LS810-B.
- Please do read the user manual carefully and thoroughly so as to ensure the safe usage of this product, and keep the manual well for your further reference in case you have problems.

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## ♥ General Description

Thank you for selecting TRANSTEK blood pressure Monitor (LS810-B). The monitor features blood pressure measurement, pulse rate measurement and auto-save the result. The design provides you with two years of reliable service.

Reading taken by the LS810-B are equivalent to those obtained by a trained observer using the cuff and stethoscope auscultation method.

This manual contains important safety and care information, and provides step by step instructions for using the product.

Read the manual thoroughly before using the product.

### FEATURES:









- Systolic Blood Pressure
- Diastolic Blood Pressure
- Pulse Rate
- Memory: Up to 60 pieces of records

## ♥ Measurement Principle

This product uses the Oscillometric Measuring Method to detect blood pressure. Before every measurement, the unit establishes a "zero point" equivalent to the atmospheric pressure. Then it starts inflating the cuff. Meanwhile, the unit detects pressure oscillation generated by beat-to-beat pulsatile, which is used to determine the systolic pressure and diastolic pressure as well as pulse rate. The device also compares the longest and the shortest intervals of detected pulse wave to with the average value, and then calculates the standard deviation. The monitor will light up a warning symbol when the calculated standard deviation is larger than or equal to 15.

## ♥ Safety information

The below signs might be in the user manual, labeling or other components. They are the requirement of standard and using.

|  |   |   |   |
|--|---|---|---|
|  | Symbol for "THE OPERATION GUIDE MUST BE READ"         |  | Symbol for "TYPE BF APPLIED PARTS"  |
| CE 0123  | Symbol for "COMPLIES WITH MDD 93/42/EEC REQUIREMENTS" |  | Symbol for "ENVIRONMENT PROTECTION - Waste electrical products should not be disposed of with household waste. Please recycle where facilities exist. Check with your local authority or retailer for recycling advice" |
|  | Symbol for "MANUFACTURER"                             |  | Symbol for "DIRECT CURRENT"   |
| SN   | Symbol for "SERIAL NUMBER"                            |  | Symbol for "Authorised Representative in the European Community"  |
|  | The Bluetooth Combination Mark                        |  | Symbol for "MANUFACTURE DATE"   |

## ♥ Indications for use

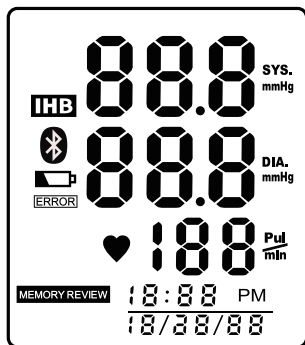
The Transtek Blood Pressure Monitor is digital monitors intended for use in measuring blood pressure and heartbeat rate with wrist circumference ranging from 13.5 cm to 21.5 cm ( about 5-8.5 inches ).

It is intended for adult indoor use only.

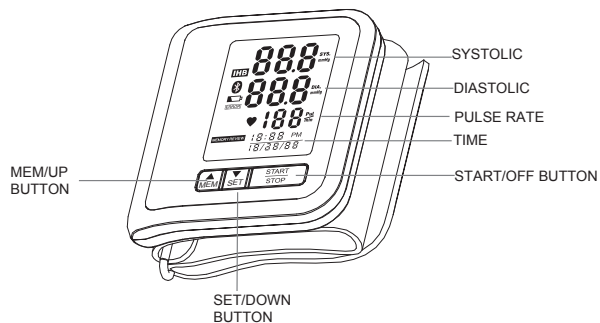
### CAUTION

- \* Please do read this user manual carefully and thoroughly before use.
- \* It is intended for adult indoor use only. Pregnant women, neonatal patients, pre-eclamptic patients and patients with severe obesity should use the device under the guidance of doctor.
- \* This device is intended for non-invasive measuring and monitoring of arterial blood pressure. It is not intended for use on extremities other than the wrist or for functions other than obtaining a blood pressure measurement.
- \* Please use the device under specified environment by user manual, otherwise the accuracy of the device will be influenced.
- \* Do not confuse self-monitoring with self-diagnosis. This unit allows you to monitor your blood pressure. Please start or end medical treatment basing solely on physician's treatment advice.
- \* If you are taking medication, consult your physician to determine the most appropriate time for your measurement. Never change a prescribed medication without your physician's consent.
- \* This unit is not suitable for continuous monitoring during medical emergencies or operations.
- \* If the pressure of the cuff exceeds 40 kPa (300 mmHg), the unit will automatically deflate. Should the cuff not deflate when its pressure exceeds 40 kPa (300 mmHg), detach the cuff from the unit and press the START/STOP button to stop inflation.
- \* Do not use the monitor under the conditions of strong electromagnetic field (e.g. medical RF equipment) that radiates interference signal or electrical fast transient/ burst signal.
- \* The maximum temperature that the applied part can be achieved is 42.5°C while the environmental temperature is 40°C.
- \* The device is not AP/AGP equipment. It is not suitable for use in the presence of a flammable anesthetic mixture with air (or oxygen, nitrous oxide).
- \* Please keep the unit out of reach of infants, children or pets, since inhalation or swallowing of small parts is dangerous or even fatal.
- \* Please use ACCESSORIES and detachable parts specified / authorised by MANUFACTURER. Otherwise, it may cause damage to the unit or danger to the user / patient.
- \* The patient is an intended operator. The patient can measure, transmit data and charge battery under normal circumstances and maintain the device and its accessories according to the user manual.
- \* The blood pressure monitor, its adaptor, and the cuff are suitable for use within the patient environment. If you are allergic to dacron or plastic, please don't use this device.
- \* The device is not intended for PATIENT transport outside a healthcare facility.
- \* This device cannot be used with HF surgical equipment at the same time.
- \* There is a PTC current limiter in the monitor, which specification is 8V and 0.5A. When the voltage and current exceed the limiting value, the monitor will stop working.
- \* ME system consists of the blood pressure monitor and its adaptor. The adaptor is specified as a part of ME equipment.

## ♥ LCD Display Signal

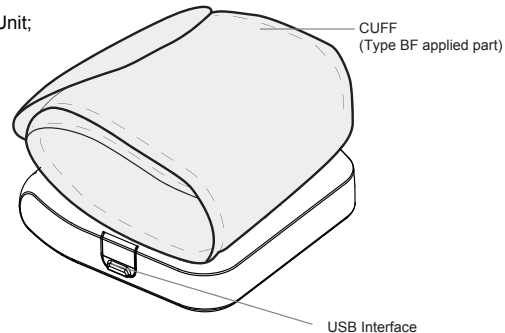


## ♥ Monitor Components



## Component List:

1. Micro Control Unit;
2. Amplifier;
3. Air Pipe;
4. Pump;
5. Valve.



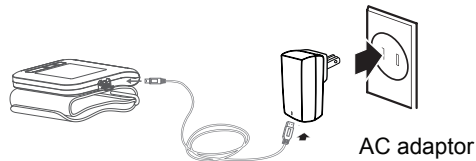
## ♥ List

1. Blood Pressure Monitor (LS810-B)
2. USB Cable and AC Adaptor (Model: UE0WCP- 0501000SPC)
3. User Manual

| SYMBOL                             | DESCRIPTION              | EXPLANATION                              |
|------------------------------------|--------------------------|--|
| <b>SYS</b>                         | Systolic Blood Pressure  | High blood pressure                      |
| <b>DIA</b>                         | Diastolic Blood Pressure | Low blood pressure                       |
| <b>Pul min</b>                     | Pulse                    | beat/minute                              |
| <b>+Lo</b>                         | Low Battery              | Low battery and please charge the power. |
| <b>mmHg</b>                        | Unit                     | Measurement unit of blood pressure       |
| <b>IHB</b>                         | IHB Detector             | Irregular Heartbeat Detector             |
| <b>Bluetooth</b>                   | Bluetooth                | Successful Bluetooth Connection          |
| <b>ERROR</b>                       | Error                    | Error                                    |
| <b>MEMORY REVIEW</b>               | Memory                   | Recalling the history records            |
| <b>18:88 PM</b><br><b>18/38/88</b> | Time                     | Hour:Minute (Month/Day/Year)             |

## ▼ Power Supply and Charge Power

1. The battery of LS810-B is built-in rechargeable lithium-ion battery, the battery current is 420 mAh.
2. Please use the AC adaptor and USB cable to charge the battery, just like the following picture:



Charging the power under following circumstances:

- + displays on the LCD
- The LCD display dims
- When powering on the monitor, the LCD doesn't light up.

### CAUTION

1. The battery of LS810-B is built-in rechargeable lithium-ion battery, please do not disassemble it by the unauthorized maintenance personnel.
2. Under the normal using, it can charge power about 300 times, if the battery cannot charge the power normally or the blood pressure monitor cannot use normally, please connect with the authorized maintenance personnel.
3. Storage and use the blood pressure monitor at the cool, dry and ventilated environment. Avoid to approach to the fire and the heat source, or it will cause the battery explode.
4. Only can use the Transtek's authorized AC Adaptor (Model: UE0WCP-0501000SPC) to charge the power. You cannot use the blood pressure monitor during the process of charging.
5. During the process of charging, the blood pressure monitor display . When the charging is finished, please pull the plug in time.
6. When charging, shall not touch charging connector and the patient simultaneously.

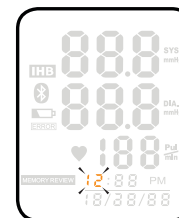
## ▼ Setting Date and Time

Please proceed to time setting before your initial use so as to ensure each piece of record are labled with a time stamp. (Year Range: 2012-2052; Time Format: 12 Hours)

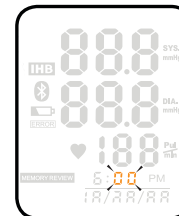
1. When the monitor is OFF, press and hold "SET" button for 3 seconds to enter Time Setting Mode.



2. As pictured in the right, the blinking numeral "12" representing [HOUR]. Press "MEM" button to change the numeral. Each press will increase the numeral by one in a cycling manner.



3. Press "SET" button again to confirm [HOUR]. Then the numeral representing [MINUTE] blinks.



4. Repeat step 2 and 3 to confirm [MINUTE].



5. Repeat step 2 and 3 to confirm [MONTH], [DAY] and [YEAR].



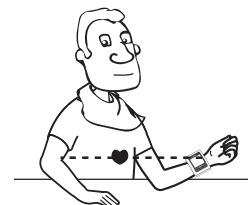
7. After confirming [YEAR], the LCD will display "dONE" and the monitor will shut off automatically.



## ♥ Positioning the Cuff



1. Remove all accessories (watch, bracelet, etc) from your left wrist. If your physician has diagnosed you with poor circulation in your left wrist, use your right wrist.
2. Roll or push up your sleeve to expose the skin.
3. Apply the cuff to your left wrist with your palm facing up.
4. Position the edge of the cuff about 1-2 cm.
5. Fasten the wrist cuff around your wrist, leaving no extra room between the cuff and your skin. If the cuff is too loose, the measurement will not be accurate.
6. Patients with Hypertension:  
The middle of the cuff should be at the level of the right atrium of the heart; Before starting measurement, please sit comfortably with legs uncrossed, feet flat on the floor, back and arm supported.

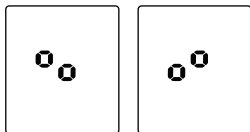
- Resting for 5 minutes before measuring.
- Wait at least 3 minutes between measurements. This allows your blood circulation to recover.
- For a meaningful comparison, try to measure under similar conditions. For example, take daily measurements at approximately the same time, on the same wrist, or as directed by a physician.




## ♥ Pair-up the Blood Pressure Monitor with Your Device


1. Turn on Bluetooth and the app.  
Make sure both are ON when pair-up is proceeding.

2. When the monitor is OFF, press and hold the START button to start pair-up. The symbol  and the symbol  will be shown on the LCD alternatively, indicating pair-up is proceeding.



If **SUCCEED**, symbol  will be shown on the LCD.



If **FAIL**, symbol  will be shown on the LCD.

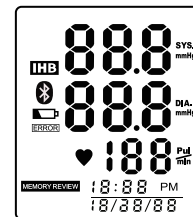


3. The monitor will shut off automatically after Pair-up process is complete.

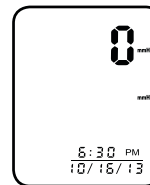
**Bluetooth Module No.:** AW2540MV1  
**RF Frequency Range:** 2.4 GHz  
**Output Power Range:** 24 dB  
**Supply Voltage:** -0.3 V to 3.9 V  
**Transmitting Distance:** 10 meters

## ♥ Start Measurement

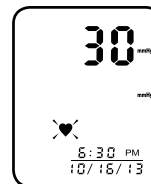
1. After correctly positioning the cuff, press START button to turn on the monitor, and it will complete the measurement process automatically.



Adjust to zero.



Inflating and measuring.



Display and save the measuring result.



2. This device will proceed to data transmission automatically after measurement. The Bluetooth symbol blinks on the LCD indicates data is transmitting.



START  
STOP

3. If the data is successfully transmitted, the LCD will then display "dONE".

If the data transmission fails, the LCD will display "E" instead.

4. Press STOP button to turn off the monitor. Otherwise it will power off automatically.

### CAUTION

1. When using this device, please pay attention to the following situation which may interrupt blood flow and influence blood circulation of the patient, thus cause harmful injury to the patient: too frequent and consecutive multiple measurements; the application of the CUFF and its pressurization on any wrist where intravascular access or therapy, or an arterio-venous (A-V) shunt, is present; Inflating the cuff on the wrist on the side of a mastectomy.
2. Do not apply the cuff over a wound, otherwise it can cause further injury.
3. Do not inflate the cuff on the same limb which other monitoring ME EQUIPMENT is applied around simultaneously, because this could cause temporary loss of function of those simultaneously-used monitoring ME EQUIPMENT.
4. Using it in case to result in prolonged impairment of the circulation of the blood of the PATIENT.

### ♥ Recall the Records

1. Press "MEM" button to access the memory. The monitor will display the calculated average of the last three readings first.



2. Press "MEM/UP" button or "SET/DOWN" button to rotate the history records.

"MEM/UP" to go forward;

"SET/DOWN" to go backward.



### CAUTION

The most recent record (1) is shown first. Each new measurement is assigned to the first (1) record. All other records are pushed back one digit (e.g., 2 becomes 3, and so on), and the last record (60) is dropped from the list.



## ♥ Delete the Records

When you did not obtain the accurate measurement, you can clear all the measuring results by following below steps.

1. Under Memory Recalling Mode, press and hold both the "MEM" button and the "SET" button for 3 seconds.



2. The LCD will display "dEL dONE", indicating that memory clearing is complete. And then it will shutdown automatically.



### CAUTION

Under Memory Recalling Mode, if you wish to give up clearing, press "START/STOP" to turn off the monitor.

3. When there is no memory in the monitor, if you press the "MEM" button to look up history, the LCD will display as pictured to the right.



## ♥ Tips for Measurement

It can cause inaccuracy if the measurement is taken in the following circumstances.



Within 1 hour after dinner or drinking



Immediate measurement after tea, coffee, smoking



Within 20 minutes after taking a bath



When talking or moving your fingers



In a very cold environment



When you want to discharge urine



## ♥ Maintenance

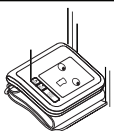
To obtain the best performance, please follow below instructions.



Put in a dry place and avoid the sunshine



Avoid immersing it in the water. Clean it with a dry cloth in case.



Avoid shaking and collision.



Avoid dusty environment and unstable temperature surrounding



Use the slightly damp cloth to remove the dirt.



Avoid washing the cuff

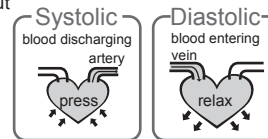


### CAUTION

1. Please make sure the unit functions safely and it is in proper working conditions before use. Don't service or maintain while the device is in use.
2. If you have any problems with this device, such as setting up, maintaining or using, please contact with SERVICE PERSONNEL of Transtek. Don't open or repair the device by yourself.
3. Please report to Transtek if any unexpected operation or events occur.
4. Cleaning: Dust environment may affect the performance of the unit. Please use the soft cloth to remove the dirt of the device and cuff before and after use.
5. Calibration: The manufacturer does not require such preventive inspections or calibration by other persons and will make available on request of circuit diagrams, component part list, etc.
6. Disposal: Degraded sensors may result in inaccurate measurement while loosened electrodes may cause the monitor's failure to power on. Please dispose of ACCESSORIES, detachable parts, and ME EQUIPMENT according to local guidelines.

## ♥ What are systolic pressure and diastolic pressure?

When ventricles contract and pump blood out of the heart, the blood pressure reaches its maximum value in the cycle, which is called systolic pressure. When the ventricles relax, the blood pressure reaches its minimum value in the cycle, which is called diastolic pressure.



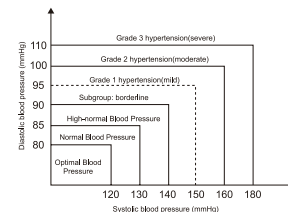
## ♥ What is the standard blood pressure classification?

The blood pressure classification published by World Health Organization (WHO) and International Society of Hypertension (ISH) in 1999 is as follows:



### CAUTION

Only a physician can tell your normal BP range. Please contact a physician if your measuring result falls out of the range. Kindly note that only a physician could tell whether your blood pressure value has reached a dangerous point.



| Level<br>Blood Pressure (mm Hg) | Optimal | Normal  | High-normal | Mild    | Moderate | Severe |
|---------------------------------|---------|---------|-------------|---------|----------|--------|
| SYS                             | <120    | 120-129 | 130-139     | 140-159 | 160-179  | ≥180   |
| DIA                             | <80     | 80-84   | 85-89       | 90-99   | 100-109  | ≥110   |

## ♥ Irregular Heartbeat Detector

This Blood Pressure Monitor is equipped with an intelligent function of Irregular Heartbeat (IHB) Detector. During each measurement, this equipment records the heartbeat intervals and works out the standard deviation. If the calculated value is larger than or equal to 15, this equipment will light up the IHB symbol on the screen when displaying the measuring result.



### CAUTION

The appearance of the IHB icon indicates that a pulse irregularity consistent with an irregular heartbeat was detected during measurement. Usually this is NOT a cause for concern. However, if the symbol appears often, we recommend you seek medical advice. Please note that the device does not replace a cardiac examination, but serves to detect pulse irregularities at an early stage.

### ♥ Why my blood pressure is varies even in one day?

1. Individual blood pressure varies every in one day, it also affected by the way you tie your cuff and the your measurement position, so please take the measurement at the same condition.
- 2.The varies of the pressure is greater if the person take medicine.
- 3.Waiting at least 4-5 minutes for another measurement.



### ♥ Why the blood pressure I get from the hospital is different from home?

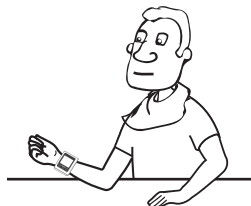
The blood pressure is different even during 24 hour because of the weather,emotion, exercise etc, specially the “white coat” in hospital which makes the results are higher than the ones at home.

The attention need to pay when you measure you blood pressure at home:

- If the cuff is tied properly.
- If the cuff is too tight or too loose.
- If the cuff is tied on the wrist.
- If you feel anxious pressured.
- You had better take deep breath 2-3 times before beginning.
- Advice:adjust yourself for 4-5 minutes until you calm down.

### ♥ If the result is the same if measuring on the right wrist?

It is ok for both wrists, but there will be some different results for different person, so suggest you measure the same wrist every time.



This section includes a list of error messages and frequently asked questions for problems you may encounter with your blood pressure monitor. If the products not operating as you think it should, check here before arranging for servicing.

| PROBLEM              | SYMPTOM                              | CHECK THIS  | REMEDY   |
|----------------------|--------------------------------------|---|--|
| <b>No power</b>      | Display is dim or will not light up. | Power is exhausted.                                       | Charge the power   |
| <b>Low batteries</b> | Show on the display                  | Power is low.   | Charge the power   |
| <b>Error message</b> | shows                                | Data communication has failed                             | Make sure that phone's Bluetooth is on or within the distance range  |
|                      | E 2 shows                            | The cuff is very tight                                    | Refasten the cuff and then measure again.  |
|                      | E 3 shows                            | The pressure of the cuff is excess.                       | Relax for a moment and then measure again.   |
|                      | E 9 shows                            | Product has not been activated.                           | Reactivated  |
|                      | E 10 or E 11 shows                   | The monitor detected motion while measuring.              | movement can affect the measurement.Relax for a moment and then measure again.   |
|                      | E 20 shows                           | The measurement process does not detect the pulse signal. | Loosen the clothing on the arm and then measure again.   |
|                      | E 21 shows                           | Measure incorrectly.                                      | Relax for a moment and then measure again.   |
|                      | EExx,shows on the display.           | A calibration error occurred.                             | Retake the measurement. If the problem persists, contact the retailer or our customer service department for further assistance.Refer to the warranty for contact information and return instructions. |

|   |  |
|---|--|
| <b>Power supply</b>                           | 3.7V 420mAh Built-in rechargeable lithium-ion battery, 5V / 1A USB AC Adaptor  |
| <b>Display moder</b>                          | Digital LCD V.A.46.5x36.5mm  |
| <b>Measurement mode</b>                       | Oscillographic testing mode  |
| <b>Measurement range</b>                      | Pressure: 0kpa-40kpa (0mmHg-300mmHg)<br>pulse value:(40-199)beat/minute  |
| <b>Accuracy</b>                               | Pressure:<br>5°C-40°C within±0.4kpa(3mmHg)<br>0°C-45°C (out of 5°C-40°C)<br>within±0.7kpa(5mmHg)<br>pulse value:±5%  |
| <b>Normal working condition</b>               | Temperature:5°C to 40°C Relative humidity ≤85%<br>Atmospheric pressure: 86kPa to 106kPa  |
| <b>Storage &amp; transportation condition</b> | Temperature:-20°C to 60°C RH: 10% to 93%<br>Atmospheric pressure: 50kPa to 106kPa  |
| <b>Measurement perimeter of the wrist</b>     | About 13.5cm-21.5cm  |
| <b>Net Weight</b>                             | Approx.110g  |
| <b>External dimensions</b>                    | Approx.79.8×72.5×13.2mm  |
| <b>Attachment</b>                             | USB cable, AC Adaptor<br>user manual   |
| <b>Mode of operation</b>                      | Continuous operation   |
| <b>Degree of protection</b>                   | Type BF applied part   |
| <b>Protection against ingress of water</b>    | IP22, It means the device could protected against solid foreign objects of 12.5 mm and greater, and against vertically falling water drops when ENCLOSURE tilted up to 15° |
| <b>Software version</b>                       | V01  |
| <b>Device classification</b>                  | Internally Powered ME Equipment  |

WARNING: No modification of this equipment is allowed.

## ♥ Contact Information

For more information about our products, please visit [www.transtek.cn](http://www.transtek.cn). you can get customer service, usual problems and customer download, transtek will serve you anytime.

**Manufactured by:** GUANGDONG TRANSTEK MEDICAL ELECTRONICS CO., LTD  
**Company:** GUANGDONG TRANSTEK MEDICAL ELECTRONICS CO., LTD  
**Address:** Zone A, 5/F., Investment Building , No. 12, Huizhan East Rd., Torch Development District, Zhongshan, Guangdong, 528437, China

**Authorized European Representative:**  
**Company:** MDSS - Medical Device Safety Service GmbH  
**Address:** Schiffgraben 41, 30175 Hannover, Germany

## ♥ Complied European Standards List

|  |  |
|--|--|
| <b>Risk Management</b>                 | EN/ISO 14971:2007  |
| <b>Labeling</b>                        | EN/ISO 15223-1:2012  |
| <b>User Manual</b>                     | EN 1041:2008   |
| <b>General Requirements for Safety</b> | EN 60601-1:2006/AC:2010<br>EN 60601-1-1:2010<br>EN 80601-2-30:2010 |
| <b>Performance Requirements</b>        | EN 1060-1:1995+A2:2009<br>EN 1060-3:1997+A2:2009                   |
| <b>Electromagnetic Compatibility</b>   | EN 60601-1-2:2007/AC:2010  |
| <b>Clinical Investigation</b>          | EN 1060-4:2004   |
| <b>Usability</b>                       | EN 60601-1-6 : 2010<br>EN 62366:2008                               |
| <b>Software life-cycle processes</b>   | EN 62304:2006/AC:2008  |

## ♥ FCC Statement

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.

Caution: The user is cautioned that changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

NOTE: 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.

FCC Radiation Exposure Statement:

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment.

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

## ♥ EMC Guidance

Table 1 Guidance and manufacturer's declaration – electromagnetic emissions- for all EQUIPMENT and SYSTEMS

| Guidance and manufacture's declaration – electromagnetic emission   |                |   |
|---|----------------|---|
| The LS810-B is intended for use in the electromagnetic environment specified below. The customer of the user of the LS810-B should assure that it is used in such an environment. |                |   |
| Emission test   | Compliance     | Electromagnetic environment - guidance  |
| RF emissions<br>CISPR 11  | Group 1        | The LS810-B must emit electromagnetic energy in order to perform its intended function. Nearby electroic equipment may be affected. |
| RF emission<br>CISPR 11   | Class B        |   |
| Harmonic emissions<br>IEC 61000-3-2   | Not applicable |   |
| Voltage fluctuations/<br>flicker emissions IEC<br>61000-3-3   | Not applicable |   |

Table 2 Guidance and manufacturer's declaration – electromagnetic immunity – for all ME EQUIPMENT and ME SYSTEMS

| Guidance and manufacture's declaration – electromagnetic immunity  |  |                            |   |
|--|--|----------------------------|---|
| The LS810-B is intended for use in the electromagnetic environment specified below. The customer of the user of the LS810-B 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<br>±8 kV air                         | ±6 kV contact<br>±8 kV air | Floors should be wood, concrete or ceramic tile. If floors are covered with synthetic material, the relative humidity should be at least 30%. |
| Electrical fast transient/burst IEC 61000-4-4  | ±2 kV for power supply lines                       | N/A                        |   |
| Surge IEC 61000-4-5  | ±1 kV line(s) to line(s)<br>±2 kV line(s) to earth | N/A                        |   |
| Voltage dips, short interruptions and voltage variations on power supply input lines IEC 61000-4-11  | <5% $U_T$ (>95% dip in $U_T$ ) for 0.5 cycle       | N/A                        |   |
|  | 40% $U_T$ (60% dip in $U_T$ ) for 5 cycles         | N/A                        |   |
|  | 70% $U_T$ (30% dip in $U_T$ ) for 25 cycles        | N/A                        |   |
|  | <5% $U_T$ (>95% dip in $U_T$ ) for 5 sec           | N/A                        |   |
| Power frequency (50Hz) magnetic field IEC 61000-4-8  | 3A/m   | 3A/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.   |  |                            |   |

Table 4 Guidance and manufacturer's declaration – electromagnetic immunity – for ME EQUIPMENT and ME SYSTEMS that are not LIFE-SUPPORTING


| Guidance and manufacture's declaration – electromagnetic immunity  |                             |                  |   |
|--|-----------------------------|------------------|---|
| The LS810-B is intended for use in the electromagnetic environment specified below. The customer or user of LS810-B should assure that it's used in such an environment. |                             |                  |   |
| Immunity test  | IEC 60601 test level        | Compliance level | Electromagnetic environment - guidance  |
| Conducted RF IEC 61000-4-6   | 3 Vrms<br>150 kHz to 80 MHz | N/A              | <p>Portable and mobile RF communications equipment should be used no closer to any part of the LS810-B, including cables, than the recommended separation distance calculated from the equation applicable to the frequency of the transmitter.</p> <p><b>Recommended separation distance</b><br/> <math>d = 1.167 \sqrt{P}</math></p> <p><math>d = 1.167 \sqrt{P}</math> 80 MHz to 800 MHz</p> <p><math>d = 2.333 \sqrt{P}</math> 800 MHz to 2.5 GHz</p> <p>where <math>P</math> is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacture and <math>d</math> is the recommended separation distance in metres (m).</p> <p>Field strengths from fixed RF transmitters, as determined by an electromagnetic site survey, <sup>a</sup> should be less than the compliance level in each frequency range. <sup>b</sup></p> <p>Interference may occur in the vicinity of equipment marked with the following symbol:</p>  |
| Radiated RF IEC 61000-4-3  | 3 V/m<br>80 MHz to 2.5 GHz  | 3 V/m            |   |

Table 6 Recommended separation distances between portable and mobile RF communications equipment and the EQUIPMENT or SYSTEM – for ME EQUIPMENT or ME SYSTEM that are not LIFE-SUPPORTING

|              |  |
|--------------|--|
| 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.  |
| <sup>a</sup> | 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 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 LS810-B is used exceeds the applicable RF compliance level above, the LS810-B should be observed to verify normal operation. If abnormal performance is observed, additional measures may be necessary, such as re-orienting or relocating the LS810-B. |
| <sup>b</sup> | Over the frequency range 150 kHz to 80 MHz, field strengths should be less than 3V/m.  |

| Recommended separation distances between portable and mobile RF communications equipment at the LS810-B.  |   |   |  |
|---|---|---|--|
| The LS810-B is intended for use in an electromagnetic environment in which radiated RF disturbances are controlled. The customer or the user of the LS810-B can help prevent electromagnetic interference by maintaining a minimum distance between portable and mobile RF communications equipment (transmitters) and the LS810-B 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<br>$d = 1.167 \sqrt{P}$                     | 80 MHz to 800 MHz<br>$d = 1.167 \sqrt{P}$ | 800 MHz to 2.5 GHz<br>$d = 2.333 \sqrt{P}$ |
| 0.01  | N/A   | 0.117                                     | 0.233                                      |
| 0.1   | N/A   | 0.369                                     | 0.738                                      |
| 1   | N/A   | 1.167                                     | 2.333                                      |
| 10  | N/A   | 3.690                                     | 7.377                                      |
| 100   | N/A   | 11.67                                     | 23.33                                      |
| For transmitters rated at a maximum output power not listed above, the recommended separation distance $d$ in metres (m) can be determined 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 4 These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.  |   |   |  |