

* 本说明书内容若有变更，恕不另行通知 *

UNI-T®



UTi640H

红外热成像仪

Professional Thermal Imager

P/N:110401113667X

序言

尊敬的用户：

您好！感谢您选购全新的UTi640H智能型红外热成像仪，为了正确使用本产品，请您在使用之前仔细阅读本说明书全文，特别是“注意事项”部分的内容。

如果您已经阅读完本说明书全文，建议您将此说明书妥善保管，与热成像仪配件一同放置或者放在您随时可以查阅的地方，以便在将来的使用过程中查阅。

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注意事项

⚠ 警告

- 1) 不要在超出设备许可的工作温度或储存温度环境中使用或存放仪器，这可能会造成设备的损坏。
- 2) 不要将设备直接对准很高强度的热辐射源，例如太阳，激光器，点焊机等，这可能会导致设备的损坏。
- 3) 不要敲打，扔掷或震动仪器和配件，以免造成损坏；
- 4) 不要将有溶解性或类似的液体用于设备、线缆，这可能会导致设备的损坏；
- 5) 擦拭本设备时请遵照以下措施：
 - 非光学表面：在必要时可以使用干净柔软的布擦拭热像仪的非光学表面；
 - 光学表面：使用热像仪时请避免弄脏镜头的光学表面，特别要避免用手触碰镜头，因手上的汗迹会在镜头玻璃上留下痕迹且可能会腐蚀玻璃表面的光学镀膜层。当光学镜头表面受到污染时，使用专业镜头擦拭布小心地擦拭。
- 6) 在使用设备时请尽量保持稳定，避免剧烈晃动；
- 7) 请勿自行拆卸本机，这有可能造成设备损坏，并丧失保修权利；
- 8) 不要将电池置于高温环境或靠近高温物体；不要使电池的正负极短路；不要将电池置于潮湿环境或水中，否则会导致设备电池损坏。

⚠ 注意

- 1) 尽量避免将设备暴露在灰尘或潮湿的环境中。在有水的环境中使用，应避免水溅到仪器上。在不使用仪器时应盖上镜头盖；
- 2) 当不使用本设备时，请将仪器和所有配件放置在专用包装箱内；
- 3) 避免将随机的SD卡挪作他用；
- 4) 该产品介绍所使用的商品图文信息，实际产品因批次不同，材质和细节上偶有微小差异，敬请谅解，请以收到具体实物为准；
- 5) 操作手册中提供的实验数据为理论值，均来自优利德公司内部实验室，仅供参考；客户不可将其作为下单购物的参考。特此说明！如有任何疑问可联系客服，进行详细咨询。

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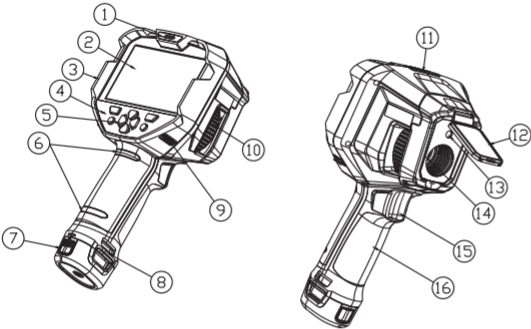
1. 技术指标

型号	UTi640H
红外参数	
探测器类型	非制冷红外探测器
红外分辨率	640 x 480
红外超分辨率	1280 x 960
红外响应波段	8~14μm
像元尺寸	12μm
帧频	≤30Hz
热灵敏度/NETD	<35mK
调焦方式	手动对焦
热成像镜头焦距	18mm
光圈	F/1.0
视场角	24°(H)x19.3°(V)
空间分辨率/IFOV	0.67mrad
测温功能	
测温范围	-20℃~650℃（-4°F~1202°F）
测温精度	±1.5℃或±1.5% （取最大值，0℃<目标温度≤650℃，环境温度25℃）
	±2℃或±2% （取最大值，-10℃≤目标温度≤0℃、环境温度25℃）
测温分辨率	0.1℃
测温单位	℃/°F/K
测温显示	3个测温点（中心点、最高温、最低温）
温度分析	支持点/线/圆/矩形分析工具，最多16个
等温线	自动等温/手动等温/区间等温/上等温/下等温
高低温追踪	√

高低温报警	声音报警、图像报警
测温档位	第1档：-20℃~120℃（手动）
	第2档：0℃~650℃（手动）
	第3档：-20℃~650℃（自动切换）
图像显示	
显示屏	4.3" LCD触摸屏
显示分辨率	800 x 480
可见光分辨率	500万像素
色板	白热、黑热、红热、铁红、彩虹、高对比度彩虹、熔岩
图像模式	热成像、可见光、T-Mix、画中画
数字变倍	1X~6X
图像格式	JPG
视频格式	MP4/UIR
系统功能	
按键	电源键、OK键、方向键、图库键、返回键、拍照扳机键
存储	内部存储+外部存储 Micro SD卡
数据接口	Type-C USB
二维码扫描	√
拍照	√
视频录像	√
全辐射热像视频流	√
文字备注	√
语言备注	√
WiFi	√
手机APP	iOS, Android
PC分析软件	√
PC投屏	√
语言	简体中文、英语

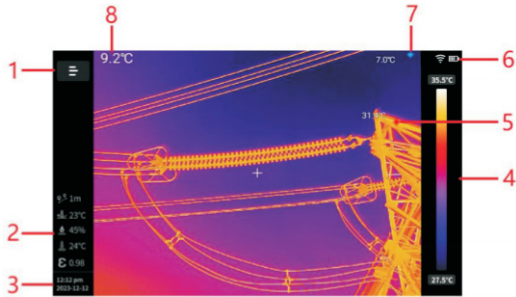
供电参数	
电池类型	5200mAh可更换电池包（UT-M17）
电池工作时间	>4h
充电系统	Type-C直充
充电时长	<4h
充电电压/电流	5V/2A
一般规范	
工作温度	-10℃~50℃
存储温度	-20℃~60℃
工作湿度	10%~95%RH（非冷凝）
防护等级	IP54
跌落防护	2m
认证	CE, FCC, RoHS

2. 结构



项目	说明	项目	说明
1	扬声器	9	挂绳孔
2	液晶显示屏	10	调焦轮
3	后壳	11	USB盖
4	麦克风	12	镜头盖
5	按键	13	可见光摄像头
6	防水塞	14	红外镜头
7	电池组件	15	拍照扳机键
8	手柄绳扣	16	前壳

3. 显示说明

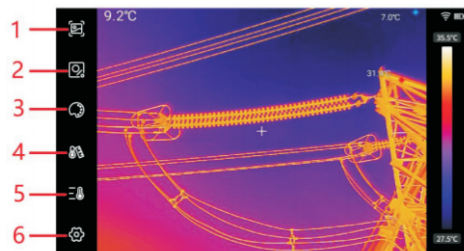


项目	说明	项目	说明
1	菜单	5	最高温度点
2	参数显示	6	状态栏
3	时间/日期	7	最低温度点
4	色条	8	中心点温度

4. 快速操作说明

1. 将电池插入电池仓内；
2. 长按电源开关按键 2~3S 开启热像仪；
3. 进入实时红外，将热像仪对准目标；
4. 手动旋转调焦环，进行手动对焦，使目标成像清晰；
5. 选择拍照或者录像模式后，按拍照键保存图像或录制视频；
6. 通过触摸屏或按键进行其他操作。

5. 菜单

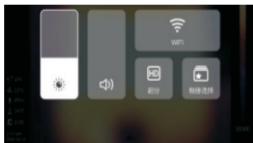


1. 模式切换	红外、可见光、T-Mix、画中画
2. 分析工具	可添加点、线、圆、矩形测温工具，可进行对比、删除
3. 色板	可切换 白热、黑热、红热、铁红、彩虹、高彩虹、熔岩 色板
4. 等温线	自动等温、手动等温、向上等温、向下等温，区间等温
5. 参数设置	发射率、反射温度，相对湿度，测量距离，环境温度
6. 设置	详情如下

6. 设置

拍摄模式	拍照、录像、视频格式、倒计时
测温范围	可选择：-20~120℃/0~650℃/自动量程
温度报警	可打开高温报警/低温报警/声音报警开关
WiFi	可打开/关闭热点，打开热点后可修改热点名称/密码，手机连接WiFi后可以使用配套APP
全图标记	可根据需求开启水印，包括：最高温值、最低温值、中心值、日期时间、色条、温度参数，并显示在主页面
报告编辑	设置PDF报表各参数，包括PDF模版、报告名称、添加公司名称、报告人、审核人员
设备设置	语言：可选择中文、英文
	单位切换：温度单位可切换℃、°F、K，距离单位可切换m、yd
	屏幕亮度：可调节亮度
	声音调节：可调节声音
	USB模式：可切换为U盘模式和视频直播模式
	日期时间：可更改日期和时间
	存储信息：显示机身和SD卡已使用空间、未使用空间，并可进行清空数据操作
	自动关机：可根据需求设置机器自动关机时间
设备设置	重置设置：可将用户设置的参数永久性删除
	出厂设置：可将机器恢复到最初始状态，请谨慎操作。
	软件更新：检查设备版本更新状态，支持本地升级
设备信息	显示设备信息

7. 下拉菜单



下拉菜单可进行各种快捷操作，如：WiFi、音量、亮度、开启关闭超分功能等一系列操作

8. 测温参数

1. 发射率：指被测物体与相同温度的绝对黑体比率，是衡量物体辐射量的一个重要指标，范围介于0.00—1.00之间。
2. 反射温度：指被测物体周边有其他热源辐射能量。
3. 测量距离：指热成像仪与被测物体之间的间距。
4. 环境温度：指热成像仪与被测物体所处的外部环境温度。
5. 相对湿度：指被测物体的辐射量在传输过程中空气中水分含量。

△ 注意：

1. 以上参数是否设置准确对最终温度测量结果有不同程度的影响。
2. 推荐值：一般情况下，如果你不确定这些值，建议如下：
发射率：0.95（-20℃~120℃和0℃~650℃两个档位）；
环境温度：25℃
相对湿度：55%RH
反射温度：25℃
测量距离：0.6m
3. 测温精度：±1.5℃或±1.5%（取最大值，0℃<目标温度≤650℃，环境温度25℃）
±2℃或±2%（取最大值，-10℃≤目标温度≤0℃、环境温度25℃）

9. 手机App

第一步

- iOS设备请在APP Store搜索“Thermal Link”下载或扫码获取。
- Android设备请登录优利德官网下载“Thermal Link”或扫码获取。



苹果版（iOS）下载



安卓版（Android）官网下载

第二步

- 在设备设置中开启设备WiFi热点；
- 手机搜索设备热点名称“UTi640H”选择该热点，输入密码12345678连接；
- WiFi连接成功后进入软件APP，即可实时屏幕传输、远程查看/下载图片等功能。

注：为保证WiFi信号数据稳定传输，请尽量保证连接距离在10m范围内，且无障碍物阻隔。

10. 常见发射率表

材质	发射率	材质	发射率
木	0.85	黑纸	0.86
水	0.96	聚碳酸	0.8
砖	0.75	混凝土	0.97
不锈钢	0.14	氧化铜	0.78
胶带	0.96	铸铁	0.81
铝板	0.09	锈	0.8
铜板	0.06	石膏	0.75
黑铝	0.95	油漆	0.9
人体皮肤	0.98	橡胶	0.95
沥青	0.96	土壤	0.93
PVC塑料	0.93		

优利德®

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PREFACE

Thank you for purchasing the new UTi640H Professional Thermal Imager. In order to use this product safely and correctly, please read this manual thoroughly, especially the Cautions part.

After reading this manual, it is recommended to keep the manual at an easily accessible place, preferably close to the device, for future reference.

LIMITED WARRANTY AND LIABILITY

Uni-Trend guarantees that the product is free from any defect in material and workmanship within one year from the purchase date. This warranty does not apply to damages caused by accident, negligence, misuse, modification, contamination and improper handling. The dealer shall not be entitled to give any other warranty on behalf of Uni-Trend. If you need warranty service within the warranty period, please contact your seller directly.

This warranty is the only compensation you can obtain. Uni-Trend will not be responsible for any special, indirect, incidental or subsequent damage or loss caused by any reason or speculation. As some areas or countries do not allow limitations on implied warranties and incidental or subsequent damage, the above limitation of liability and stipulation may not apply to you.

CAUTIONS

⚠ WARNINGS

1. Use or store the device in permitted operating or storage temperature to avoid damage.
2. Do not aim the device at strong heat sources, such as sun, laser device, spot-welder, etc.
3. Do not knock, toss, or shake the device and accessories.
4. Do not use solvents or similar liquids on the product or cables.
5. Please refer the following instructions to wipe the device:
 - Non-optical surface: If necessary, use a clean and soft cloth to wipe the non-optical surface of the thermal imager.
 - Optical surface: Avoid staining the optical surface of the lens when using the thermal imager, and especially avoid touching the lens with hands, as it can leave traces on the lens glass and may corrode (erode) the optical coating layer on the glass surface. When optical surface is stained, wipe it carefully with a dedicated lens paper.
6. Keep it stable when using the device.
7. Do not disassemble the device to avoid product damage and loss of warranty rights.
8. Do not place battery in high temperature environment or close to the high temperature targets. Do not cause the battery polarity short circuit. Do not place battery into damp condition or water.

⚠ NOTES

- 1) Do not expose the device to dust or moisture. Do not splash water to the device when you're using it. Cover the lens when the device is not in use;
- 2) Place the device and all accessories into a dedicated packaging box when the device is not in use,;
- 3) Do not use the included SD card for other purposes;
- 4) Due to different batches, the materials and details of actual products may be slightly different from the graphic information. Please refer to the actual goods received.
- 5) The experimental data provided in this manual are theoretical values obtained from Uni-Trend's internal laboratories and are for reference only. Customers should not use this data as a basis for placing orders. If you have any questions, please contact customer service for detailed consultation.

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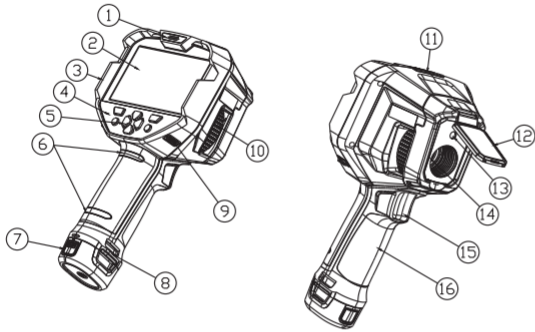
1. Specifications

Model No.	UTi640H
IR Parameters	
Detector Type	Uncooled infrared detectors
Infrared Resolution	640 x 480
Super Resolution	1280 x 960
Spectral Range	8~14μm
Pixel Size	12μm
Frame Rate	≤30Hz
Thermal Sensitivity/NETD	<35mK
Focus	Manual
Lens Focal Length	18mm
Aperture	F/1.0
Field of View (FOV)	24°(H)x19.3°(V)
IFOV	0.67mrad
Temperature Measurements	
Temperature Measurement Range	-20°C~650°C (-4°F~1202°F)
Accuracy	±1.5°C or ±1.5% (whichever is greater, 0°C< targeted temperature≤ 650°C, ambient temperature: 25°C)
	±2°C or ±2% (whichever is greater, -10°C≤ targeted temperature≤ 0°C, ambient temperature: 25°C)
Resolution	0.1°C
Unit	°C/°F/K
Temperature Display	3 temperature spots (Center spot, HI spot, LO spot)
On Screen Analyzer	Tools of Point/Line/Circle/Rectangle, At most 16.
Isotherm	Auto/ Manual / Section/ Above/ Below
HI/LO Temperature Tracking	√

HI/LO Temperature Alarm	Buzzer & LCD Animation alarm
Temperature Scale	-20°C~120°C (Manual)
	0°C~650°C (Manual)
	-20°C~650°C (Automatic)
Image Display	
Display	4.3" LCD Touch Display
Display Resolution	800×480
Digital Camera Resolution	5MP
Color Palette	White Hot, Black Hot, Red Hot, Ironbow, Rainbow, Rainbow HC, Lava
Image Mode	Thermal, Visual, T-Mix, PIP
Digital Zoom	1x~6x
Image Format	JPG
Video Format	MP4/UIR
System Functions	
Button	Power/OK/Direction/Album/Return/Trigger
Storage	Built-in storage & External Micro SD
USB	Type-C USB
QR Code Scanning	√
Photo Capturing	√
Video Recording	√
Full Radiometric Video Stream	√
Text Annotation	√
Voice Annotation	√
WiFi	√
Mobile APP	iOS, Android
PC Analysis Software	√
PC Screen Projection	√
Language	Chinese & English

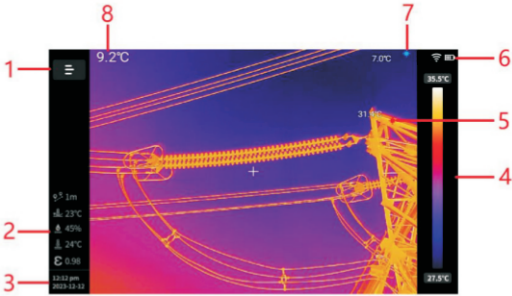
Power Supply Parameters	
Battery	5200mAh detachable battery pack (UT-M17)
Battery Operating Time	> 4h
Charging System	Directly charge device via Type-C cable;
Charging Time	< 4h
Charge Voltage/Current	5V/2A
General Specifications	
Working Temperature	-10℃~50℃
Storage Temperature	-20℃~60℃
Working Humidity	10%~95%RH, non-condensing.
IP Rating	IP54
Drop Proof	2m
Certificate	CE, FCC, RoHS

2. Structures



Item	Description	Item	Description
1	Speaker	9	Wrist Strap Hole
2	LCD Touch Screen	10	Focusing Ring
3	Rear Case	11	USB Cover/Charging Interface/SD Card Slot
4	Microphone	12	Lens Cover
5	Functional Buttons	13	Digital Camera
6	Waterproof Cap	14	Infrared Camera
7	Battery Pack	15	Photo Trigger
8	Housing Strap Fastener	16	Front Case

3. Display

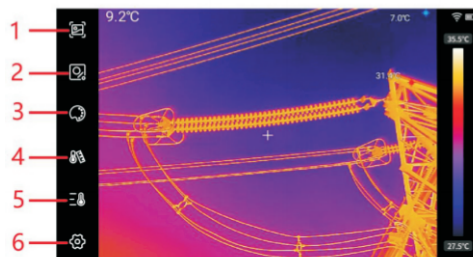


Item	Description	Item	Description
1	Menu	5	HI Spot Temp
2	Measurement Parameters	6	Status Bar
3	Date & Time	7	LO Spot Temp
4	Temperature Bar	8	Center Point Temp

4. Quick Operation Instructions

1. Install the battery into the battery holder.
2. Long-press POWER button for 2~3s to power on the thermal imager.
3. Enter the real-time infrared mode, and aim the thermal imager at the target.
4. Focusing the target until the image gets clear.
5. In Photo or Video mode, tap the trigger to save images or record videos.
6. Touch the screen or press the button to enable other functions.

5. Menu

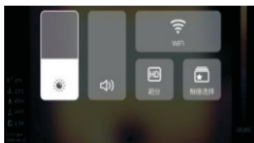


1. Image Modes	Thermal, Visual Image, T-Mix Fusion, PIP
2. On Screen Analyzer	Measurement tools of point, line, circle and rectangle can be added, which can be preset, contrasted and deleted
3. Color Palettes	White Hot, Black Hot, Red Hot, Ironbow, Rainbow, Rainbow HC, and Lava.
4. Isotherm	Auto/ Manual/ Section/ Above/ Below.
5. Parameter Settings	Set the emissivity, reflected temperature, relative humidity, object distance and ambient temperature.
6. Settings	Details are shown below

6. Settings

Capture Modes	Photo Capturing, Video Record, Video Format, Countdown.
Temperature Measurement Range	Selectable: -20~120°C/0~650°C/Auto Range
HI/LO Alarm	HI/LO temperature alarm and audible alarm.
WIFI	The hotspot can be ON/OFF. With hotspot ON, the hotspot name and password can be modified. The supporting APP can be used after the mobile phone is connected to Wi-Fi.
Overlay	Enable watermark as needed, including high temperature value, low temperature value, center value, date & time, temperature bar and measurement parameters, displayed on the main interface.
Report Editing	Set parameters in PDF report, including PDF template, report name, company name, reporter, and auditors.
System Settings	Languages: Chinese/English
	Unit Switch: Temperature Units: °C/°F/K; Distance Units: m/yd.
	Brightness: Adjust the brightness of screen.
	Sound: Volume adjust
	USB mode: Can be switched to USB mode and live stream mode.
	Date & Time: The date and time of device can be modified.
	Storage: Display the used and available space of the device and SD card, and allows clearing data.
	Auto Power OFF: Set the auto-power-off time as needed.
	Reset Factory Settings: Permanently delete the user-defined parameters.
	Factory Reset: Restore the device to the initial status, data will be deleted, which cannot be recovered, please exercise caution.
	Software Update: Check device version, and support local upgrade.
	About: Display the information about device.

7. Quick Menu



One-stop functions e.g. WiFi, Volume adjust, Brightness, Super resolution can be invoked by bringing up the quick menu.

8. Measurement Parameters

1. Emissivity: It refers to the ratio of the measured object to the absolute black body with same temperature. It is an important indicator for measuring the radiation of an object, ranging from 0.00 to 1.00.
2. Reflected Temperature: It refers to the radiation energy from other heat sources surrounding the measured object.
3. Object Distance: It refers to the distance between the thermal imager and the measured object.
4. Ambient Temperature: It refers to the external environment temperature where the thermal imager and the measured object are located.
5. Relative Humidity: It refers to the atmospheric moisture content during the transmission of radiation from the measured object.

⚠ Notes:

1. The accurate setting of the above parameters is beneficial to the final temperature measurement results.
2. Recommended values: In general, if you have no idea about these values, please see followings:
Emissivity: 0.95 (Two temperature scales: -20°C~120°C and 0°C~650°C);
Ambient Temperature: 25°C
Relative Humidity: 55%RH
Reflected Temperature: 25°C
Object Distance: 0.6m
3. Temperature Measurement Accuracy:
±1.5°C or ±1.5% (whichever is greater, 0°C< targeted temperature ≤ 650°C,
room temperature: 25°C);
±2°C or ±2% (whichever is greater, -10°C ≤ targeted temperature ≤ 0°C,
room temperature: 25°C)

9. Mobile App

Step 1

For iOS, download "Thermal Link Pro" on Apple APP Store or scan the following code.
For Android, download "Thermal Link Pro" in UNI-T's official website or scan the following code.



iOS



Android

Step 2

- Turn on Wi-Fi hotspot on thermal device.
- Search the Wi-Fi name of "UTi640H" on mobile device.
- Enter password 12345678 to connect Wi-Fi.
- Access APP to get functions of real-time image transmission, remote viewing and images download, etc.

Note: To ensure stable data transmission, please try to maintain the connection within a range of 10m and ensure there are no obstacles blocking the signal.

10. Emissivity Table

Materials	Emissivity	Materials	Emissivity
Wood	0.85	Black Paper	0.86
Water	0.96	Polycarbonate	0.8
Brick	0.75	Concrete	0.97
Stainless Steel	0.14	Copper Oxide	0.78
Adhesive Tape	0.96	Cast Iron	0.81
Aluminum Plate	0.09	Rust	0.8
Copper Plate	0.06	Plaster	0.75
Black Aluminum	0.95	Paint	0.9
Human Skin	0.98	Rubber	0.95
Asphalt	0.96	Soil	0.93
PVC Plastic	0.93		

11. FCC Compliance Statement

⚠ Warning

To assure continued compliance, any changes or modifications not expressly approved by the party. Responsible for compliance could void the user's authority to operate this equipment.

FCC Statement

This equipment 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.

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:

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

FCC/IC RF Radiation Exposure and SAR Statements

The device has been tested for body-worn Specific Absorption Rate (SAR) compliance. The FCC/IC has established detailed SAR requirements and has established that these requirements. RF Exposure Information The radio module has been evaluated under FCC Bulletin C95.1 and IEEE 1528 and found to be compliant to RF Exposure from radio frequency devices. This model meets the applicable government requirements for exposure to radio frequency waves. The highest reported SAR level for usage near the body (0mm) is 0.318 W/kg.

12. Notes

Recommended operating environment: indoor use

Pollution degree: 2

Altitude : up to 2000m

EMC: EN 61326-1, Class A

The contents of this manual are subject to change without prior notice

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