LONGOT 朗高特

LONGOT TL342/TL650

观瞄型热像仪用户手册

Thermal sight user manual

http://www.szlongot.com

深圳市朗高特科技发展有限公司

http://www.szlongot.com

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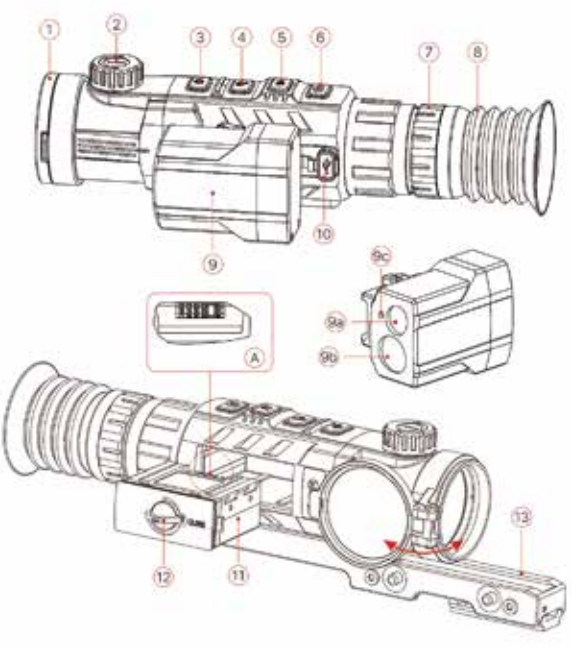


1. 镜头盖
2. 物镜调焦旋钮
3. 电源键
4. 上键/放大键
5. 菜单键/M键
6. 下键/拍照键
7. 目镜调焦环
8. 遮光眼罩
9. 激光测距组件（选配）
9a. 激光发射窗口
9b. 激光接收窗口
9c. 激光指示灯
10. Type C 接口
11. 电池包
12. 电池包拉环
13. 快拆皮轨夹具

按键说明

	状态	短按	长按
电源键	关机	——	开机
	开机	图像校准	关机/待机
	待机	取消待机	——
	单次测距模式	测距	——
	高级菜单界面	返回	——
	盲元校准界面	添加/删除盲元点	——
上键/放大键	状态	短按	长按
	主界面	电子变倍	开启/关闭PIP
	菜单界面	向上切换选项	——
M 键	状态	短按	长按
	主界面	进入快捷菜单	进入高级菜单
	快捷菜单界面	调节参数	保存并退回主界面
	高级菜单界面	确认参数	保存并退回主界面
	盲元校准界面	确认选项/保存位置	保存并退回主界面
拍照键	状态	短按	长按
	主界面	拍照	开启/关闭录像功能
	菜单界面	向下切换选项	——
	录像界面	拍照	保存视频
上键+下键	状态	短按	长按
	主界面	——	开启/关闭测距模式
	测距模式	切换单次测距模式/连续测距模式	——
M 键+下键	状态	短按	长按
	测距模式	——	开启/关闭激光功能

1.技术参数

型号	TL342 / TL342 LRF	TL650 / TL650 LRF
分辨率	384*288	640*480
像元尺寸,μm	12	12
NETD,mk	⩽50	⩽50
帧频,Hz	50	50
物镜,mm	F42mm /1.0	F50mm /1.2
视场角度,°	6.3*4.7	5.3*4.0
放大倍率,x	4-16	2.8-11.2
数码变倍,x	2-4	2-4
出瞳距离, mm	55	55
出瞳直径,mm	6	6
屈光度调节, D	-4~+4	-4~+4
显示屏类型	AMOLED	AMOLED
分辨率	1024*768	1024*768
显示屏大小	0.39	0.39
电池类型 / 电池容量	Li-Ion Battery Pack / 3600mAh	
输出电压 / 输入电压	DC3.7V / 3V~4.2V	
外部电源	5V (Type C USB)	
工作时长(at t=22℃), h	6	6
最大后座力, g/s²	1000	1000
防护等级, IP code	IP67	IP67
内置内存, Gb	32	32
激光测距	可选	可选
重量 g	820	830
尺寸， mm	250x65x58	250x61x58
激光波长, nm	905	905
最大测量距离, m/y	1000/1094	1000/1094
探测距离,m	2000	2500

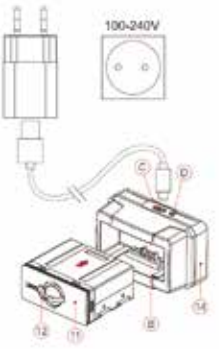
备注：
发现距离：指正常环境下1.7*1.2米的目标，发现距离受温度、湿度、天气、环境影响变化。

2. 包装明细

TL系列红外瞄准镜	软包	导轨
充电电池	充电器	充电座
数据线	说明书	保修卡

3. 电池包

TL系列使用的是可充电的锂离子电池包，操作时间可长达6小时。在首次使用前，请先给电池包充满电。



将电池包的“引脚A”对准电池“充电盒14”的“沟槽B”，将电池包插入到电池充电盒内；

将数据线的Type C端口连接到电池盒的“端口C”；

将数据线的另外一端连接到电源适配器的USB端口；

将电源适配器插入100-240V的插座上进行电池包的充电；

完成以上安装后，电池盒上的LED“指示灯D”将会发光或者闪烁：

- 当指示灯持续显示红色时，表示电池包正在充电；
- 当指示灯变成绿色时，表示电池包已充满；
- 当指示灯红色闪烁显示，表示电池充电盒连接电源，但是没有安装电池包。

电池包安装：

拉出电池包上的”拉环12”，顺时针旋转使其与电池包成水平状态；

将电池包的针脚对准设备上的插槽，将电池包安装到机器上；

当电池包完全插入机器的外壳上后，逆时针旋转电池包上的“拉环12”锁住电池包；

此时“拉环12”处于垂直状态，放下拉环，即拉环上的凸起指向电池包的CLOSE字样，电池包安装完成；

TL系列仅支持此电池包供电。如使用其他的电池包供电可能会造成无法挽回的损失，对设备造成损害，并可能引起火灾。

安全措施：

当电池长时间未用，需对电池包进行部分充电，而不应该完全充电或完全放电；

当电池从寒冷的环境带到温暖的环境后，不要立即对它进行充电，需等待30-40分钟进行预热；

禁止使用被损坏或者改造的充电器进行充电；

充电时间请勿超过24小时；

4. 外部供电

TL系列支持外部供电，如充电宝等。

将外部电源连接到TL系列的Type C端口；

设备将转到外部电源供电，并同时对内部电池包进行充电；

此时显示屏上的电池图标将会变成充电图标；

如果连接外部供电，但是没有安装电池包，电池图标将会变成USB图标；

当外部电源供电断开时，机器会自动转到电池包供电，不会关机。

5. 开/关机，待机

开机：打开镜头盖，长按”电源键”，设备开机。

关机：使用后，长按”电源键”3s，出现关机倒计时界面。当倒计时图标从3数到0时设备关机，松开按键，出现关机数据保存中提示界面，待数据保存完成后，显示屏变黑，设备关机。在关机数据保存期间，请勿切断电源，否则数据将无法保存。

待机：在倒计时结束前松开按键，设备进入待机模式，可通过短按“电源键”，唤醒设备。

6.视度调节

开机后，根据个人视度转动目镜调节环调节目镜，直至画面清晰。

7.焦距调节

根据目标位置，旋转镜头调焦环，直到图像清晰。

8. 电子变倍

TL系列支持对图像进行1-4倍放大，增加视放大率。

在主界面下，循环短按”上键”进行图像的循环缩放；

TL342系列放大倍率：4×，8×，12×，16×，

TL650系列放大倍率：3×，6×，9×，12×。

9. 拍照录像

机器内置内存为32GB，支持拍照录像功能。图像和视频的文件将会以时间命名，所以建议在使用拍照录像功能前，先在主菜单中完成系统日期和时间的设置，或者通过在APP的设置选项中，完成系统时间和日期的同步。

拍照：

主界面下，短按“拍照键”，进行拍照，画面出现卡顿，并在左上角闪现拍照图标，拍照结束后，图标消失；

所拍摄的图片将会被保存在内置的存储空间中。

录像：

主界面下，长按“拍照键”，进行录像；

屏幕左上角出现录像图标以及录制时间提示框，时间格式为HH:MM:SS（小时：分钟：秒）；

录制过程中，时间提示框左侧的红点将会持续闪烁；

录制过程中，短按“拍照键”可以进行拍照操作，拍照图标显示与时间提示框右侧；

长按“拍照键”，停止并保存视频录制；

所拍摄的视频和照片会被保存在内置的存储空间里。

注意：

* 视频录制的文件最大持续时间为5分钟，当时间超过5分钟，视频将被自动记录到下一个新的文件中。

10. 内存访问

当设备开机且连接到电脑时，设备会被计算机识别为内存卡，进行图片和视频上传拷贝。

• 双击电脑桌面上“我的电脑”-找到名称为“Longot”的设备双击打开 -双击打开名称为“Internal Storage” 的设备，访问内存；

• 打开内存后出现以时间命名的不同文件夹，命名方式是xxxx(年)xx(月)xx(日);

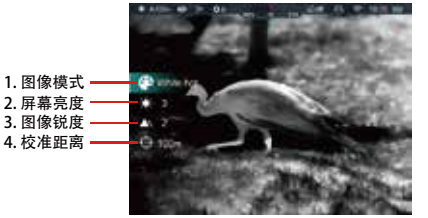
• 文件夹里存储的是当天拍摄的照片和录制的视频，选择需要的文件或者文件夹进行拷贝或删除。

11. 状态栏

1. 当前图像模式
2. 当前武器类型的校准距离（如A100m）
3. 超清模式状态
4. 当前视放大倍率（如3x）
5. 校正模式（在自动快门校正模式A下，在自动校正前5秒，会显示一个倒计时图标代替字母A显示于校正图标后面）。当设备刚开启时，会自动连续进行快门校正，但不会有倒计时提示，只有在设备完全稳定（大约在连续操作10分钟）后，才会有自动快门校正的倒计时提示。
6. 罗盘（罗盘未开启时不显示）
7. 待机设置（出厂默认off）
8. 视频输出状态（视频输出选择关闭时，不显示图标）
9. Wi-Fi状态
10. 时钟
11. 电池包电量状态（当图标内部显示为绿色时，表示电量高于20%，电量比较充足；显示为红色时，表示电池电量不足，请及时充电；当图标中间出现闪电标识，表示正在为电池包充电；当使用外接电源时，图标将显示为 （USB充电图标）

11. 快捷菜单

* 主界面下，短按”M键”，进入快捷菜单；



1. 图像模式

选择此项后，短按M键对图像模式进行循环调节，依次是白热、黑热、红热、伪彩、目标凸显五种模式；

2. 屏幕亮度

选择此项后，短按M键，进行屏幕亮度1-5级调节；

3. 图像锐度

选择此项后，短按M键，进行图像锐度1-5级调节；

4. 校准距离

选择此项后，短按M键，可快速切换当前校准类型下的校准距离（例如选择武器A时，此快捷选择，只切换保存在A下的距离值）

* 长按M键，保存修改并退回主界面。

* 快捷菜单下，5s内无操作，设备会自动保存当前修改并退回主界面。

12. 主菜单

* 主界面下，长按”M键”，进入主菜单；

短按”上键”、”下键”切换菜单选项；

短按”M键”对当前菜单选项下的参数进行修改，或进入菜单下一层级；

蓝色光标所在的位置表示选中项，选中项的图标会由白色变成蓝色；

在所有菜单界面下，短按“电源键“不保存修改直接退回上一级菜单，或退回到

主界面；长按”M键“，保存修改并直接退回到主界面；
在所有菜单界面下，15s无按键操作，设备将不保存修改，自动退回到主界面。

1. 超清模式

选择“超清模式”选项（开机后首次进入主菜单时，光标默认在此选项上）；
短按”M键“开启或关闭超清模式，并伴随着快门校正的咔嚓声；
开启/关闭时，状态栏中会有相应的图标变化。

2. Wi-Fi

TL系列内置Wi-Fi模组，设备可以通过Wi-Fi与外部设备(电脑、智能手机)无线连接。
- 通过”上键、”下键”，选择“Wi-Fi”功能选项；
- 短按”M键”开启/关闭Wi-Fi功能；
- 开启/关闭时，状态栏中会有相应的图标变化。
- 当瞄准镜的Wi-Fi开启后，在移动设备上查找名称为“TL342_XXXXXX”的Wi-Fi，其中XXXXXX是由数字和字母组成的流水码。
- 选择该Wi-Fi，输入密码并连接，初始密码为12345678；
- Wi-Fi连接成功后，可以通过移动设备上的APP对瞄准镜进行操控。

3. 视频输出

在外接显示屏时，请打开视频输出开关。
短按”上键”或”下键”，选择“视频输出”功能选项；
短按”M键”开启/关闭模拟视频输出功能；
开启时顶部状态栏会出现视频输出的图标。

4. 校正模式

当图像发生劣化或者不均匀时，可以通过校正进行改善。校正可以使探测器的背景温度得以平衡，可以消除图像中的缺陷。
短按”上键“或”下键“，选择“校正模式”功能选项；
短按”M键“进入校正功能的二级菜单；
短按”上键“、”下键“，在以下三种模式之中选择一个：
自动快门校正（A）：设备会根据软件算法自动快门校正，无需盖上镜头盖（传感器自动关闭内部快门）。设备在进行自动快门校正前，会在状态栏快门图标的后面有5s倒计时提示。倒计时期间，短按“电源键”取消此次自动快门校正。在此模式下，用户也可以通过短按“电源键”进行快门校正（即手动快门校正）。

手动快门校正（M）：在主界面下，短按”电源键”进行手动快门校正，无需盖上镜头盖（传感器自动关闭内部快门）。
背景校正（B）：当选择校正模式B时，短按”电源键”进行背景校正，主界面出现文字提示——校正前盖上镜头盖，2s后进行背景校正。校正完成后，打开镜头盖。

5. 电子罗盘

电子罗盘与传统指南针式和平架结构罗盘相比能耗低、体积小、重量轻、精度高，其输出信号通过处理可实现数码显示。
短按”上键”或”下键”，选择“电子罗盘”功能选项；
短按”M键”开启/关闭电子罗盘功能；
罗盘开启后，显示于顶部状态栏的中间位置。

6. 运动传感器

显示水平和垂直的倾斜角度，提高用户体验。
短按”上键”或”下键”，选择“运动传感器”功能选项；
短按”M键”开启/关闭运动传感器；
开启后，会在显示屏两侧出现相关功能；
左侧弧形标尺代表倾斜角，右侧垂直标尺代表俯仰角。

7. 分化设置（设置校枪类型、分划类型以及分划颜色）

短按”上键”或”下键”，选择“分划设置”选项；
短按”M键”进入分划设置二级菜单，进行如下设置；

7.1 武器类型

短按”上键”或”下键”，选择“武器类型”功能选项；
短按”M键”确认选择并进入武器类型的次级菜单；
短按”上键”（4）、”下键”在三种武器类型（A、B、C）中选择一个；
短按”M键”确认选择，图标闪烁并退回至上一级菜单界面。

7.2 分划类型

短按”上键“或”下键“，选择“分划类型”选项；
短按“M键”确认选择并进入分划类型的次级菜单；
短按”上键“或”下键”在7种分划类型中选择一个；
十字分划的类型也会随着光标的移动而发生变化；
短按”M键”确认选择，图标闪烁并退回至上一级菜单界面。

7.3 分划颜色

短按”上键”或”下键”，选择“分划颜色”选项；
短按”M键”确认选择并进入分划颜色的次级菜单；
短按”上键”或”下键”在4种分划颜色中选择一个，从上到下分别是黑色、白色、红色、绿色；
十字分划的颜色也会随着光标的移动而发生变化；
短按”M键”确认选择，图标闪烁并退回至上一级菜单界面。

8. 校零

在校零之前先要设置武器类型以及校零距离。

TL系列支持用户在1-999米的任何距离进行校零。

短按“上键”或“下键”，选择 “校零”功能选项；

短按“M键”进入校零功能的二级菜单，显示校零距离；

根据目标设置的距离，短按“上键”、”下键”选择校零距离；

短按”M键“，确认校零距离，并进入校零距离的子菜单；

1. 如果预设的校零距离与设备上显示校零距离一致，可以按照如下步骤，直接进行校零：

选择校零功能，并短按”M键“进入校零界面；

在屏幕的左上角显示分划所在的X轴、Y轴的坐标；

将瞄准镜的十字分划中心瞄准目标距离的靶心并操作，操作完成后，观察实际点的位置；

保持瞄准的位置不动，同时长按”上键“和”下键“，画面冻结，同时在屏幕上出现冻结标识；

短按”M键“切换分划的移动方向X轴或Y轴；

选中某一方向后，短按或长按”上键“或”下键“移动分划，直到十字分划的中心位置对准到实际点的位置；

短按移动一个像素，长按可以使光标每次10个像素连续移动；

长按“M键”，保存分划位置并退回到主界面。

提示：校零位置设置完成之后，可以通过快捷菜单中的校零距离选项进行切换。

2.如果校零距离中没有与设定的目标距离一致，可以通过此选项进行设置：

选择一个无效的校零距离，短按”M键“进入其子菜单选项；

短按”上键“或”下键“，选择“设置校零距离”选项；

短按”M键”激活校零距离重置功能，两个小三角符号出现在数字的上下两端，如图：

短按”上键”、”下键”对当前位置的数字的数值进行设置；

短按”M键”，进行百位、十位、个位数字位置的切换；

设置完成后，长按”M键”保存并返回到校零功能选项，状态栏以及菜单中的校零距离也会同步更新。

9. 待机设置

短按”上键“或”下键“，选择“待机设置”选项；

短按“M键”进入待机设置的子菜单，分别有2min/4min/6min/off四个选项；

短按”上键”、”下键”进行选择；

短按”M键”确认选择，并显示于顶部状态栏；

Off表示关闭待机功能；

注意：

- 当设备处于如下状态时，待机自动激活：向上>70°向下>70°，向左>30°向右>30°；
- 当设备处于射击状态（水平放置）时，不待机。

10. 测距光标校准

当激光所指向的目标位置与分划中心指示的位置不一致时，可以通过此功能对激光测距组件的光标位置进行校正（需搭配激光测距组件使用）。

在主菜单中，选择“测距光标校准”功能选项；

短按”M键”进入测距光标校准界面，同时激光指示灯自动开启；

屏幕中央出现小的十字光标：

- X表示X轴方向即横向；
- Y表示Y轴方向即纵向；
- center使光标回屏幕中心；
- default使光标回到出厂设置。

短按”上键”、”下键”进行选项切换；短按”M键”确认选择；

选择X轴或Y轴方向时，选中项图标会持续闪烁，通过”上键“或”下键“对光标进行移动，”上键“控制光标右移或上移，”下键“控制光标左移或下移，短按移动一个像素，长按可以使光标每次10个像素连续移动；

移动完成后，短按“M键”保存并退出，图标停止闪烁；

当选择center/default时，短按”M键“，光标回归center /default原始位置；

将光标移动到激光所指示的位置后，长按”M键“保存位置并退出至主界面。

11. 盲元校正

瞄准镜在使用过程中，可能会出现有缺陷的像素，如亮点或暗点，此时需借助盲元校正功能删除这些有缺陷的像素。

在主菜单中，选择“盲元校正”功能选项；

短按”M键”进入盲元校正界面，屏幕中央出现小的十字光标，同时自动开启PIP功能，默认位置在左下角；

在PIP的小窗口右侧分别显示光标的移动方向：X轴方向、Y轴方向，以及盲元校正的数量；

短按”M键”切换选择移动方向；

短按或长按”上键”或”下键在当前方向下进行光标移动，”上键”控制光标

右移或上移，”下键”控制光标左移或下移，短按移动一个像素，长按可以使光标每次10个像素连续移动；
移动完成后，短按”M键”保存此方向的移动，并切换至另一方向；
重复上述操作可对光标进行重复移动，直到将光标移动到盲元所在位置；
短按”电源键”，添加盲元，PIP中闪现Add字样，添加成功；
在同一位置，再次短按”电源键”，撤销该处的盲元校正，PIP中闪现Del字样；
每次添加或删除盲元时，盲元数量也会随之发生变化；
当光标移动到PIP附近时，PIP及右侧内容将自动移到左上角；
校正完成后，长按”M键“，出现提示框，询问是否保存此次校正；
短按“上键”、”下键“切换选择，短按”M键“确认选择；
选择Yes确认保存并退出；选择No，取消保存并退出；
选择Yes后，界面上会出现“Saving…… 5”的五秒倒数提示，当出现“Saving successful”提示时，表示保存成功，自动退出并返回到主界面。

12. 罗盘校准

在主菜单中，选择“罗盘校准”功能选项；
短按”M键“进入罗盘校准界面，出现校准提示图标；
将瞄准镜沿着图标所示的三个轴向进行旋转，每轴向至少旋转一周360°；
15s后默认校准结束并退出至主界面。

13. 设置

13.1 日期设置

短按”M键“进入“设置”的二级菜单；
选择“日期”选项；
短按”M键“激活日期重置功能，日期是按照年/月/日的形式呈现的；
短按或长按”上键“、“下键”设置正确的年、月、日的数值；
短按“M键”，进行年、月、日之间的切换；
设置完成后，长按选择”M键“保存并退出日期重置功能。

13.2 时间设置

短按”M键“进入“设置”的二级菜单；
选择“时间”选项，时间采用24小时制，显示时/分；
短按”M键“激活时间重置功能；
短按或长按”上键“、”下键“设置正确的时和分；
短按”M键” ‘，进行时和分钟之间的切换；
设置完成后，长按”M键”保存并退出时间重置功能；
时间重置后，状态栏中的时间也会随之改变。

13.3 语言选择

短按”M键”进入“设置”的二级菜单；
选择“语言”选项，短按”M键”进入语言选择的二级菜单；

短按”上键”、”下键”在英语和俄语两种语言进行切换；
短按”M键”确认选择并保存退出；

13.4 单位设置

短按”M键”进入“设置”的二级菜单；
选择“单位设置”选项，短按”M键”进入单位设置的二级菜单；
短按”上键”、”下键”选择需要的测量单位米或者码；
短按”M键”确认选择并保存退出；

13.5 自动隐藏

隐藏界面中的内容，只保留分划，从而使图像无遮挡。
短按”M键”进入“设置”的二级菜单；
选择“状态自动隐藏”选项，短按”M键”进入状态自动隐藏的二级菜单；
短按”上键”、”下键”选择开、关；
短按”M键”确认选择并保存退出；

13.6 恢复出厂设置

所有功能恢复到出厂默认状态。
短按”M键”进入“设置”的二级菜单；
选择“恢复出厂设置”选项，短按”M键”进入恢复出厂设置的二级菜单；
短按”上键”、”下键”选择Yes、No；Yes表示确认恢复到出厂设置，No表示取消；
短按”M键”确认选项；
当选择Yes时，瞄准镜会自动重新启动；
当选择No时，操作取消并返回到上一级菜单。

13.7 版本信息

可查看硬件信息。
短按”M键”进入“设置”的二级菜单；
选择“版本信息”选项；
短按”M键”进入显示当前瞄准镜的相关信息；
长按”M键”退出并返回至上一层级菜单。

13. 激光指示和测距

1. 激光测距

连接激光测距仪后。
在主界面下，同时长按”上键”+”下键”，开启激光测距功能；
屏幕上出现一个测距光标，右上角显示测距值，在测距值左侧显示测距模式。
当测距值超出1000米的可测量距离，显示MAX；
TL系列支持两种测距模式：单次测距（SGL）和连续测距（CONT）。同时短按”上键”+”下键”，可进行单测距/连续测距的切换；

测距模式开启时，默认为单次测距，测距值左侧显示SGL，短按'电源键”进行单次测距；单侧测距模式下，快门校正功能不可用；
连续测距模式下，测距值左侧显示CONT，右上角的测距值会根据指示的目标实时变化，更新时间为3s；连续测距模式下，快门校正功能可以使用；
同时长按”上键”+”下键”，退出激光测距功能。
2. 激光指示
在测距模式下，同时长按”M键”和”下键，可以开启/关闭激光指示功能，激光指示灯开启/关闭；
注意：
- 开启测距模式时，将不会自动开启激光指示功能；
3. 测距光标校准
- 测距模块首次安装使用或者测距不准时，需要对其进行测距光标校准；
- 将激光指示灯对准某一目标位置，观察显示屏中测距光标所在位置是否与激光所指示的位置一致；
如果位置不一致需要对测距光标进行校准，保持激光对准位置不变，在主菜单中开启激光校准功能，移动测距光标位置使其与激光所指示的位置重合。

14. PIP画中画

画中画功能，就是在主图像的上方同时显示一个的单独“小窗口”，小窗口显示的是选取主图中以十字分划为中心的某一区域被2倍放大的部分图像。
在主界面下，长按“上键”，开启/关闭PIP功能；
当短按”上键“对主界面图像进行放大之后，PIP小窗口中的图像也会被同步2倍放大。

15. 产品更新

TL系列热成像仪支持APP技术，可以通过Wi-Fi连接到智能手机或平板电脑，进行图像的实时传输、控制操作以及程序更新。
在手机应用商店里搜索”Cam802”进行APP的下载与安装。
安装完成后，打开应用程序；
如果您的设备已连接到移动设备上，请打开移动设备上的移动数据网络。当设备连接到互联网后，会自动跳出更新提示，点击“Now”进行下载更新，或者“Later”稍后更新；

DISCLAIMER

This product is prohibited use for illegal way, including illegal hunting, people's private illegal photographing , purpose connected with army, chemical, biological or nuclear weapons, or missiles capable of delivering such weapons and other acts that violate laws and regulations. that we will not supply the goods to an entity in the future in a destination subject to UN, EU or OSCE embargo where that act would be in breach of the terms of that embargo 9; and that we will not supply the goods, or any replica of them, in the future if we know or suspect that they are intended or likely to be used in any nuclear explosive activity i or unsafeguarded nuclear fuel cycle.

LONGOT TECHNIC

Components control

Power Button	Current operation mode	Short press	Long press
	Device is off	——	Power on the device
	Device is on	Calibrate the detector	Power off / Standby
	Standby mode	Wake up the device	——
	Single rangefinder mode	Distance measurement	——
	Main menu	Exit menu without saving	——
	Defective pixel calibration	Add/Delete defective pixel	——
Up / E-zoom Button	Current operation mode	Short press	Long press
	Home screen	Digital Zoom	PIP on/off
	Main menu / Quick menu	Navigation upwards	——
M Button	Current operation mode	Short press	Long press
	Home screen	Enter quick menu	Save and exit to home screen
	Quick menu	Switch and confirm parameters	
	Main menu	Enter the submenu / Confirm selection	
	Defective pixel calibration	Confirm selection / Save position	
Photo Button	Current operation mode	Short press	Long press
	Home screen	Take a Photograph	Start video recording
	Main menu / Quick menu	Navigation downwards	——
	Video recording	Take a Photograph	Stop and save video
Up + Down Button	Current operation mode	Short press	Long press
	Main menu	——	Active the rangefinder mode
	Rangefinder mode	Switch between single and continuous mode	Turn rangefinder mode off
Menu + Down Button	Current operation mode	Short press	Long press
	Rangefinder mode	——	Turn laser indicating on/off

1.Specification

Model	TL342 / TL342 LRF	TL650 / TL650 LRF
Resolution, pix	384*288	640*480
Pixel Size,μm	12	12
NETD,mk	≤50	≤50
Frame rate, Hz	50	50
Objective Lens,mm	F42mm /1.0	F50mm /1.2
FOV,°	6.3*4.7	5.3*4.0
Magnification, ×	4-16	2.8-11.2
E-zoom, ×	2-4	2-4
Eye relief, mm	55	55
Exit pupil, mm	6	6
Diopter adjustment, D	-4~+4	-4~+4
Display type	AMOLED	AMOLED
Resolution, pix	1024*768	1024*768
Size, inch	0.39	0.39
Battery Type / Capacity	Li-Ion Battery Pack / 3600mAh	
Output Voltage / Power Supply	DC3.7V / 3V~4.2V	
External Power Supply	5V (Type C USB)	
Operating Time ,h	6	6
Recoil Power on Rifled Weapon, g/s	1000	1000
Degree of protection,	IP67	IP67
Memory, Gb	32	32
Laser Rangefinder	Optional	Optional
Weight, g	820	830
Dimension, mm	250x65x58	250x61x58
Wavelength, nm	905	905
Measuring Range, m/y	1000/1094	1000/1094
Detection Range, m	2000	2500

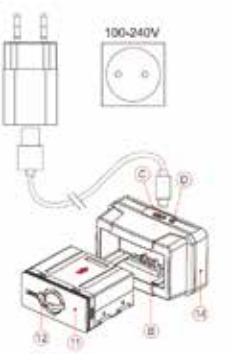
Note：Max. detection range of an object meaning :1.7x1.2 meter target in natural night conditions .
The distance is affected by temperature, humidity, weather, and environment etc.

2. Package contents

Thermal Imaging Riflescopes
Mount
Battery pack
Battery charger
Power adapter
cable
Carrying case
Manual
Warrany card

3. Battery pack

TL series are supplied with a rechargeable Li-ion Battery Pack which allows operation for up to 6 hours. Please Remember to charge the Battery Pack before first use.



- Install the Battery Pack into the battery pack charger (14) by inserting the pins (A) of Battery Pack with the groove (B) of battery pack charger (14).
- Connect the Type C plug of the data cable to the port (C) of battery pack charger (14).
- Connect anther port of the data cable to the power adapter.
- Insert the plug of the adapter to the 240V socket;
- Upon installation, the LED indicator (D) on the battery pack charger (14) will start to glow or blink:

1. When charging is progressing, the LED indicator is glowing continuously red;
2. When LED indicator lights green continuously, the battery is fully charged;
3. If the battery pack charger is connected to power supply but no battery pack installed, LED indicator is blinking with red color.

Battery Pack Installation :

- Pull out and rotate the Battery Pack Ring (12) 90 degrees clockwise.
- Install the Battery Pack by inserting the pins of Battery Pack with the groove on the Rico housing.
- When the battery pack is fully inserted into the Rico housing, rotate the Battery Pack ring (12) 90 degrees anticlockwise to lock the Battery Pack (11).
- Upon installation, flip down the ring (12), and the raised part of the ring (12) is pointing to the sign “CLOSE” on Battery Pack (11).

Safety Precautions:

- Don’t charge the battery instantly while bring the battery from cold environment to warm environment. Leave 30-40 mins before charging;
- Never use a damaged or modified charger;

- Don’t leave the Battery Pack with a charger connected to the mains longer than over 24 hours after full charge.

4. External power supply

TL series support external power supply, such as the mobile power bank (5V).
- Connect the external power supply to the USB port (10) on TL.
- The riflescope will switch to operation from external power supply, and the IBP-1 Battery Pack will begin slowly charging.
- The display will show the battery icon with charge level as a percentage.
- If the device is connected with external power supply but without the Battery Pack, the battery icon turns into USB icon .
-While external power supply is disconnected, the riflescope will switch to the Battery Pack without powering off.

5. ON / 0FF / Standby

ON : Open the lens cover (1).Press and hold down the Power (3) button to turn on the scope.
OFF : After use, hold down the Power (3) button for about 3 seconds, there will be prompts of standby and count down of switch off. Release the button until a prompt of saving date appears on the screen after counting down from 3 to 0, and the device will switch off after saving data. Please don’t cut off power supply when saving data, otherwise the data may not be saved.
Standby : Release button before the countdown finish, then device will enter the standby mode. Short press the Power (3) button again to wake it up.

6. Diopter adjustment

Rotate eyepiece diopter adjustment ring (7) until images in eyepiece are clear. After this, there is no need to rotate the eyepiece adjustment ring (7) for distance or any other conditions.

7. Focus

Rotate the lens focus knob (2) to focus on the object being observed.

8. Digital zoom

- In the home screen, briefly press the Up (4) button to operate the incremental digital zoom. in loop to switch magnification times and the status reveal on the top status bar.
- For TL342 , the apparent magnification of ×1 to ×4 digital zoom is 4×, 8×, 12×,16×; and for TL650 is 3×, 6×, 9×, 12×.

9. Photography and Video Recording

TL series is equipped with a function for video recording and photography of the observed image which is saved on the built-in 32GB memory storage.
The photo and video files are named with time, so it is suggested to reset the date and time in the Main Menu before using the photo and video functions。

Photography:

- Press the Photography (6) button in the home screen to take a photo. The image freezes for 0.5 sec with a camera icon appears on the upper left corner of screen.
- Photos are stored in the built-in storage.

Video Recording:

- In the home screen, press and hold down the Photography (6) button to start video recording.
- When the video recording starts, the icon and the video recording timer displayed in the HH:MM:SS (hour:minute:second) format will appear on the upper right of the screen.
- When recording, short press the Photography (6) button to take a photo.
- Press and hold down Photography (6) button to stop and save the video recording.
- All videos and photos will be saved in the build-in storage.

Caution:

-The maximum duration of a recorded video file is 5 minutes. After this time expires, the video is recorded to a new file automatically.

10. Memory Access

When the device is turned on and connected to a computer, it is recognized by the computer as a flash memory card, which is used to access the device's memory and make copies of pictures and videos.

- Turn on the riflescope and connect it with the computer via Type-C cable.
- Double click “my computer” on the desktop - double click to open the device named “Longot” - double click and open the device named ‘Internal Storage’ to access built-in memory.
- There are different folders named by time in the storage .
- Recorded photos and videos in that day are saved in the folders

Select desired files or folders to copy or delete.

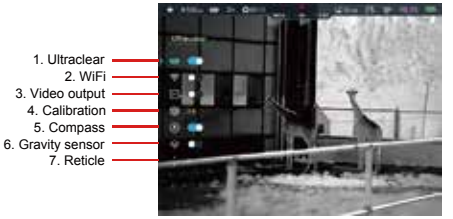
11. Status Bar

1. Current image mode

2.Actual zeroing type and distance (such as A100m)
3.Ultraclear mode (: Ultraclear off; : Ultraclear on)
4.Current magnification (such as 3.0×)
5.Calibration Mode6.Compass
7.Standby status and time
8.Video output status
9.Wi-Fi Status
10.Clock
11.Battery status

12. Quick Menu

* In the home screen, short press the M (5) button to enter the Quick Menu.



1. Ultraclear mode

- Press and hold down the M (5) button to enter the Main Menu.
- Select the Ultraclear menu option with the Up (4)/Down (6) button.
- Turn Ultraclear mode on /off with a short press of M (5) button, along with the sound of shutter calibration.

2. Wi-Fi

TL series Is built-in Wi-Fi module for wireless communication with mobile devices (smartphone or tablet).

- Press and hold down the M (5) button to enter the Main Menu.
- Select the Wi-Fi menu option with the Up (4)/Down (6) button.
- Turn Wi-Fi function on /off with a short press of M (5) button.
- The riflescope is recognized by an external device under the name “TL_XXXXXX”, XXXXXX is the last six digits of the serial number that consist of numbers and letters.
- Select this Wi-Fi signal, and enter the password (default is 12345678) on the mobile to set up the connection.
- When Wi-Fi is successfully connected, users can manipulate the device via App.
- Launch Cam802 application on your mobile device.
- Press and hold down the M (5) button to enter the Main Menu.
- Select the Wi-Fi menu option with the Up (4)/Down (6) button.
- Briefly press of the M (5) button to turn Wi-Fi on /off.

3. Video Output

Use with external display.

- Press and hold down the M (5) button to enter the Main Menu.
- Select the Video Output menu option with the Up (4)/Down (6) button.
- Briefly press of the M (5) button to turn video out on/off.
- Video out function enable connectivity with an eternal display or recording device.

4. Calibration

Calibration enables to equalize the detector temperature and eliminate the image defects.

There are three calibration modes: Automatic (A), Manual (M) and Background (B).

Select the required calibration mode in the Main Menu.

- A mode (Automatic). Device will calibrate automatically according to the software algorithm. There is no need to close the lens cover (the internal shutter covers the sensor). Before automatic calibration, there will be a 5 second countdown prompt behind the shutter icon on the status bar, that can be to cancelled this calibration during countdown with a short press of the Power (3) button. In this mode, the riflescope may be calibrated by user with the Power (3) button.
- M mode (Manual). Press the Power (3) button briefly to activate the shutter calibration without closing the lens cover (the internal shutter covers the sensor).
- B mode (Background). Close the lens cover and press Power (3) button briefly. A prompt appears on home screen as “cover lens during calibration”, background calibration starts after 2s.

5. Compass

Butilt-in accelerometer and digital compass improve accuracy by precisely identifying cant and angles.

- Press and hold down the M (5) button to enter the Main Menu.
- Select the Compass menu option with the Up (4)/Down (6) button.
- Briefly press of the M (5) button to turn the digital compass on/off.

When compass function is turned on, it will reveal in the center of top status bar.

6. Gravity Sensor

Two scales are displayed on the both sides of the screen when the gravity sensor is on.

The left scale shows tilt angle, and the right one shows pitch angle.

- Press and hold down the M (5) button to enter the Main Menu.
- Select the Gravity Sensor menu option with the Up (4)/Down (6) button.
- Briefly press of the M (5) button to turn the gravity sensor on/off.

7. Reticle

- Press and hold down the M (5) button to enter the Main Menu.
- Select the Reticle menu option with the Up (4)/Down (6) button.
- Briefly press of the M (5) button to enter the reticle submenu.

7.1 zeroing profile

- Select Zeroing Profile option with the Up (4)/Down (6) button.

- Briefly press of the M (5) button to enter the zeroing profile submenu.
- Select one of three Profiles (marked with the letters A, B, C) with a short press of the Up (4)/Down (6) button.
- Briefly press of the M (5) button to confirm your selection.

The name of the selected profile appears in the status bar at the top of the display.

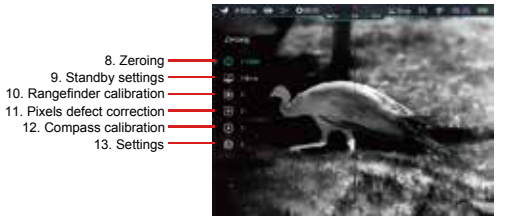
7.2 Reticle Type

- Select Reticle Type option with the Up (4)/Down (6) button in the reticle submenu.
- Briefly press of the M (5) button to enter the Reticle Type submenu.
- Select the desired reticle type in the list of seven reticle types with short pressing the Up (4)/Down (6) button.
- The reticle types change as the cursor goes down the reticle type list.

Confirm your selection with a short press of the M (5) button.

7.3 reticle color

- Select Reticle Color option with the Up (4)/Down (6) button in the reticle submenu.
- Briefly press of the M (5) button to enter the Reticle Color submenu.
- Select the desired reticle color among white, black, red and green with short pressing the Up (4)/Down (6) button.
- The reticle color changes as the cursor goes down the reticle color list.
- Confirm your selection with a short press of the M (5) button.



8. Zeroing

To zero your riflescope, you need to set a zeroing profile and zeroing distance first. TL series support the zeroing distance in the range of 1 to 999 m.

- Press and hold down the M (5) button to enter the Main Menu.
- Select the Zeroing menu option with the Up (4)/Down (6) button.
- Briefly press the M (5) button to enter the zeroing submenu (zeroing distance selection).
- Select one Zeroing Distance based on the preset target distance with the Up (4)/Down (6) button. The default values are 100m, 200m, 300m

Press M (5) button briefly to enter Zeroing Distance submenu as follows.

If the zeroing distance is the same as the preset distance, you can zero your riflescope directly as follows.

- In the Zeroing Distance submenu, select the Zeroing menu option with the Up

(4)/Down (6) button.
- Press M (5) button briefly to enter Zeroing function interface.
- The X and Y coordinates of the reticle are displayed in the upper left corner of the screen.
- Aim and shoot the target.
- Keep the reticle center the aiming point, then press and hold down the UP (4) and Down (6) button at the same time until a symbol of freeze appears on the left of the screen, and the image is frozen.
- Adjust the reticle position with the Up (4)/Down (6) button until the reticle matches the point of impact. Briefly press the Menu (5) button to switch the movement direction.
Press and hold the Menu (5) button to save the position of reticle and exit to the home screen.

If the zeroing distance is not same as the preset object, you can set the distance here.
- Select a non-primary distance and enter the submenu for operation with a brief press of the M (5) button.
- Select Reset Zeroing Distance menu item with the Up (4)/Down (6) button. Short press the M (5) button to enable resetting the zeroing distance. Two triangle icons will appear above and below the number 0
- Reset the value of the number from 0 to 9 with the Up (4)/Down (6) button.
- Press the M (5) button briefly to switch among the three numbers.
- After resetting, press and hold the M (5) button to save and exit.
The new zeroing distance appears in the status bar at the top of the display.

9. Standby Settings

- Press and hold down the M (5) button to enter the Main Menu.
- Select the Standby Settings menu option with the Up (4)/Down (6) button.
- Briefly press the M (5) button to enter the Standby Settings submenu.
Short press the Up (4)/Down (6) button to select one of four options (2min, 4min, 6min, off).
- Confirm your selection with a short press of M (5) button and reveal in the status bar at the top of the display.
- If the off is selected, it means the standby mode is turned off.
Caution:
-The standby mode will be active when the riflescope is tilted up or down at an angle of more than 70° and left or right at an angle of more than 30°.
The riflescope will not stand by while it is in the firing state.

10. Rangefinder Calibration

When the target position pointed by the laser is not aligned with the center of the rangefinder cursor on the screen, it needs to calibrate the position of laser rangefinder cursor by this function (the rangefinder module is required).
- Press and hold down the M (5) button to enter the Main Menu.
- Select the Rangefinder menu option with the Up (4)/Down (6) button.
- Enter the Rangefinder Calibration interface with a short press of the M (5) button, meanwhile the laser indicator light will be switched on automatically.
- A small cross cursor appears on the screen:
· X is the X-axis (horizontal)
· Y is the Y-axis (vertical)
· Center means to return the cursor to the center of the screen.
· Default means to return the cursor to the factory default.
- Select the options with the Up (4)/Down (6) button, and confirm your selection with a short press of the M (5) button.
- When the X or Y is selected, the icon will become blue and continuously flashing. Then, move the cursor with a short or long press the Up (4)/Down (6) button. Press the Up (4) button to move the cursor right or up and the Down (6) button to move left or down. Short press to move one pixel every time and long press to move ten pixels once.
- When cursor moved to right position, briefly press the M (5) button to save the position, and the icon will stop blinking.
- Switch to another axis and repeat until the cursor is aligned with the target position indicated by the laser.
- When Center/Default is selected, briefly press the M (5) button to return he (4)/Down (6) button.
- Press M (5) button briefly to enter Zeroing function interface.

11.Pixels Defect Correction

Defect pixels are pixels that do not change brightness compare with others on the image, they are either brighter or darker than surrounding pixels. TL series offer the possibility of removing any defective pixels on the sensor using software, as well as to cancel any deletion.
- Press and hold down the M (5) button to enter the Main Menu.
- Select the Pixels Defect Correction menu option with the Up (4)/Down (6) button.
- Briefly press the M (5) button to enter the Pixels Defect Correction interface.
- A small cross cursor instead of the reticle will appear on the center of the screen.
- The Picture in Picture (PIP) window will appear on the lower left corner of the screen.
-The cursor coordinates and the number of the corrected pixels are displayed on the right of the PIP window.
- On the right of PIP window, there are some prompts showing the movement direction of the cursor in X-axis (horizontal), Y-axis (vertical) and number of corrected pixels.
Move the cursor to align with the defective pixel with a short or long press the Up (4)/Down (6) button. Press the Up (4) button to move the reticle right or up and the - Down (6) button to move the reticle left or down. Short press to move one pixel every time and long press to move ten pixels once.
- Press the M (5) button briefly to switch the direction between X-axis and Y-axis.
- Delete the defective pixel with a short press of the Power (3) button When the pixel has been successful deleted, the Add message will appear on the PIP

window for a short time.
- Then, delete the next defective pixel by moving the cursor across the display.
- Press the Power (3) button briefly in the same position as the calibrated defective pixel to cancel the pixel correction, and the Del message will appear on the PIP window for a short time. But it is only limited to not exiting this correction.
- The amount of defect pixels changes each time adding or deleting pixels correction.
- The PIP and the prompt information will move to the upper left of the screen when cursor moves near the lower left corner.
- Press and hold the M (5) button until display shows “Do you want to save these settings?” and “Yes” and “No” options.
- Press the Up (4)/Down (6) button briefly to select ‘Yes’ to save and exit, or select ‘No’ to cancel saving and exit.
- Confirm your selection with a short press of M (5) button.
If Yes is selected, a 5-second Saving countdown appears on the screen. It will exit to the home screen after the prompt Saving successful appears.

12. Compass Calibration

- Press and hold down the M (5) button to enter the Main Menu.
- Select the Compass Calibration menu option with the Up (4)/Down (6) button.
- Briefly press the M (5) button to enter the Compass Calibration submenu.
- An icon like a triaxial coordinate system appears on the screen.
- Follow the icon prompt to rotate the riflescope along three axes at least 360 degrees each axis in the 15 seconds.
After 15s, the calibration is finished and exit to the home screen.

13.Settings

13.1 Date

- In the Settings submenu, briefly press the M (5) button to active the Date submenu. Two triangle icons will appear above and below the value.
- Date format is displayed as YY.MM.DD format (2020.01.01).
- Select the correct value for the year, month and date with a short press of the Up (4)/Down (6) button.
- Switch between digits with a short press of the M (5) button.
Save selected date and exit the submenu with a long press of the M (5) button.

13.2 Time

- In the Settings submenu, briefly press the M (5) button to active the Time submenu. Two triangle icons will appear above and below the value.
- Time format is displayed as HH:MM in 24-hours format (14:48).
- Select the correct value for the hour and minute with a short press of the Up (4)/Down (6) button.
- Switch between digits with a short press of the M (5) button.
Save selected date and exit the submenu with a long press of the M (5) button.

13.3 Language

- In the Settings submenu, select the Language menu option with the Up (4)/Down (6) button.
- Enter the Language submenu with a short press of the M (5) button.

- Select the desired language with a short press of the Up (4)/Down (6) button. TL series support English and Russian two languages.
- Confirm your selection with a short press of the M (5) button.
Submenu exit will take place automatically.

13.4 Units of Measure

- In the Settings submenu, select the Units of Measure menu option with the Up (4)/Down (6) button.
- Enter the Units of Measure submenu with a short press of the M (5) button.
- Select the desired unit between meters and yards with a short press of the Up (4)/Down (6) button.
- Confirm your selection with a short press of the M (5) button.
Submenu exit will take place automatically.

13.5 Status Auto Hiding

- In the Settings submenu, select the Status Auto Hiding menu option with the Up (4)/Down (6) button.
- Enter the Status Auto Hiding submenu with a short press of the M (5) button.
- Briefly press the Up (4)/Down (6) button to select On or Off.
- Confirm your selection with a short press of the M (5) button.
Submenu exit will take place automatically.

13.6 Factory Reset

All functions are restored to the factory default state.
- In the Settings submenu, select the Factory Reset menu option with the Up (4)/Down (6) button.
- Enter the Factory Reset submenu with a short press of the M (5) button.
- Briefly press the Up (4)/Down (6) button to select Yes or No.
- Confirm your selection with a short press of the M (5) button.

13.7 Info

Show device information
- In the Settings submenu, select the Info menu option with the Up (4)/Down (6) button.
- The relevant information of riflescope will be shown by a short press of the M (5) button.

14. Laser Indicator and Rangefinder (Rangefinder Module Required)

TL series supports to extend the laser rangefinder module (optional) for laser indicator and rangefinder, allowing to measure distance to objects up to1000m away.

14.1 Laser Rangefinder Function

- Press and hold the Up (4) and Down (6) button simultaneously in the home screen to turn the laser rangefinder function on/off.
- The ranging cursor appears on the screen. In the top right corner of the display dashes of distance values with measurement unit. And the ranging mode is on the left of the values.
- TL series have two ranging modes: SGL (single ranging) and CONT (Continuous ranging). Briefly press the Up (4) and Down (6) button simultaneously to switch between the SGL (the default mode) and CONT mode.

SGL mode, the manual calibration function is not available.
- In the CONT mode, measurement readings will be refreshed in real time as you point the riflescope at different objects one second without any keystroke operation. The manual calibration function is available in this mode.
- When ranging targets is further than 1000m, the MAX will appear in the ranging values.
- To exit the laser rangefinder function, press and hold down the Up (4) and Down (6) button simultaneously.

14.2 Laser indicator

- In the rangefinder mode, press and hold the M (5) and Down (6) button simultaneously to switch the laser indicator on /off.

14.3 Rangefinder Calibration

It needs to calibrate the rangefinder cursor after the first installation or the target position pointed by the laser is not aligned with the center of the rangefinder cursor on the screen.
- Set a target, then press and hold down the M (5) button to enter the Main Menu.
- Select the Rangefinder menu option with the Up (4)/Down (6) button.
- Enter the Rangefinder Calibration interface with a short press of the M (5) button, meanwhile the laser indicator light will be switched on automatically.
- A cross cursor appears on the screen instead of the ranging cursor.
- Move the cursor to the position pointed by the laser.

Press and hold the M (5) button to save and exit to the home screen.

15. PIP

The PIP (Picture in Picture) function allows you to see both a magnified image in a particular window and the main image.
- Press and hold down the Zoom (4) button in the home screen to switch the PIP function on /off.

When the main image is enlarged with a short press of the Zoom (4) button, the PIP image will be enlarged 2× synchronously.

16. Updates

TL series thermal imaging riflescopes support cam802 technology, which allows you to transmit the image from the thermal imager to the smartphone or tablet via Wi-Fi in real time mode.
The design of the riflescope provides the software update option. Updating is possible via the Cam802 application.
If your riflescope is already connected with mobile device, please switch on the mobile data in mobile device. After connection, the update detection is performed automatically with a prompt in the application. Click ‘Now’ to download the updates or click ‘Later’ to update later.