



**MONOCULAR OUTDOOR THERMAL
IMAGING TELESCOPE
INSTRUCTION MANUAL**



S601

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Preface

Respected users:

How are you! Thank you for purchasing our instrument. In order to use it in a better manner, we remind you to read the instruction for use carefully before use and keep it properly so as to look up in the future use.

Safety Instruction

Please ensure that you have read and understood the safety precautions described in the following text before using the product so that you can operate it correctly.

The safety precautions described in the following text guides you to operate the product and its accessories correctly and safely to avoid damage and loss to you, other people and the device.



Considerations

Please observe the following guide in order not to damage the product:

Don't assemble or dismantle the product without permission.

The product is a type of super precise equipment. Don't try to dismantle, assemble or remodel any part of the product. Repair of the product should be made by technical personnel designated by the company.

Avoid damage to probe of the product

Note: don't put the product close to strong heat source directly (such as electric iron). Otherwise, It may damage the probe of the product.

Product hum

When the product works, there is light sound of clicking every several seconds. This is normal phenomenon that the lens captures images.

**Warning**

The warning describes the acts that may cause harm to users. Please observe the following operation in order to avoid electric shock or personal injury.

- **If the product case is damaged, don't use it continuously.**

Please contact the local distributors or agents of the company under such condition.

- **During the process of use, if the product is found with smoke,spark and the burnt smell, please stop using at once.**

In case of such condition, the product power supply should be powered off first.After the smoke and peculiar smell disappears completely, please contact the local distributors or agents of the company.

- **Don't remodel the adapter and the data line.**

Otherwise, such remodeling may cause short circuit or fire.

- **Don't weld the battery without permission.**

Such operation may damage the battery and result in leakage and explosion of the battery.

- **Avoid that the battery is impacted (such as collusion and falling, etc).**

Such condition may damage the battery case or result in that the battery leaks or explode.

- **Please pull off the adapter on the power socket when charging is not made.**

The adapter may get overheated if it is connected with power supply for a long time. This may cause overheating, deformation and fire.

- **Please ensure that the plug of the adapter is inserted into the specified power socket.**

The adapter plug may be different due to the regions. Please make confirmation whether the specification of the adapter is consist with the specification of electric appliances in your region. Otherwise, this may cause overheating of the equipment, electric shock, fire, chemical leakage inside the

battery, explosion and other serious consequences.

- **When the plug of the adapter or wire is damaged, stop using immediately.**

Don't change the battery unless the plug of the charger is inserted into the socket completely.

- **Do not touch the electric wire with wet hands.**

It is possible to cause electric shock when touching the electric wire with wet hands. When pulling out the electric wire, hold the electric wire head rightly to pull out the wire. Don't pull off the electric wire directly. Otherwise, the electric wire may be broken, causing electric shock and fire.

- **Forbid dip the product into water caught in rain.**

If the case contact with any liquid, please wipe it dry immediately. If water or other liquid enters the inside of the instrument, please power off the power supply at once. Continuous use may result in product damage.

- **Clean the dust on the adapter plug and the data line.**

When it is exposed to dusty and dump environment for a long time, the dirt surrounding the electric equipment will accumulate moisture. This may cause short circuit and fire.

- **Don't use abradant, isopropanol or solvent to clean the enclosure of the device.**

Such operation may cause the product case to be damaged.

- **The product temperature may increase after a long time of charging.**

You may feel scorching heat when the hands touch the sensors.

- **Problem caused by water condensation**

Don't bring the instrument into low temperature environment from high temperature environment in a short time or from low temperature environment to high temperature environment.

This may result in that the inside of the instrument and appearance produce water condensation. In such condition, the instrument should be placed into portable box or plastic bag.

Before use, make it restore to the environmental temperature and take it out to use. If the product has water condensation inside, please power it off immediately. Otherwise, the instrument may be damaged. Operation is not allowed unless the water condensation disappears.

- **Avoid that the product is impacted (such as collision and falling, etc).**

Such operation may cause the product to be damaged. Please avoid such operation.

- **Long-time storage and regular charging.**

The product should be placed at a cool and dry environment if it not used for a long time. If the product installed with battery is stored for a long time, charging should be made regularly. Otherwise, the battery will run out and the service life will be shortened.

Preliminary Acquaintance with Infrared Thermal Imager

For a long time, infrared thermal imaging detection technology has become an important means to ensure Industrial safety in developed countries. The application field includes electric power, metallurgy, petro-chemistry, machinery, coal, traffic, fire control and national defense, etc. It can not only carry out real-time detection at high voltage, high current and high speed operation to perform real-time detection for production and instrument but also need not power off the power supply, stop the machine or stop the production to find the potential problems and prevent occurrence of malfunction. The "non contact" modern detection technology is safe, reliable and quick. It is a type of technical revolution compared with traditional contact detection method.

The infrared thermal imaging technology is widely used in the following fields:

- Power equipment, transmission, transformer line inspection;
- Hidden fire source search in fire protection;
- Personnel search and rescue in the fire, and fire command;
- Analyze the location and heat loss of leak points in heat pipes and heating equipment;
- Determining the location of the heating fault of the operating train;
- Security department night monitoring.

Overview

This product is a light and portable, simple operation, and extensive application scenario holding the infrared telescope.

Comfortable perception, providing clear and delicate heat imaging, is an ideal equipment for outdoor.

Support a variety of pseudo -color patterns, one -click switching, you can distinguish the location of the target in the scene in time.

Take the image to save the thermal imaging image into this device, read the image through USB or save it to the computer for generating reports and printing.

Cleaning of the Products

Please use damp cloth or weak soap to clean the enclosure of the device. Don't use abrasant, isopropanol or solvent to clean. The lens and screen should be cleaned with use of cleaning agents for professional optical glasses.

Lens Maintenance

Prevent damage of the infrared lens :

- Clean the infrared lens carefully. The lens is provided with refined anti-reflection coating.
- Don't clean with force to prevent damage of the anti-reflection coating. The selectable color palette.
- Use a cleaning solution for lens maintenance, such as alcohol-based commercial lens cleaners, alcohol, and a lint-free cloth or paper towel. Compressed air tanks can be used to remove loose particles.

Clean the lens:

- The compressed air tank or dry nitrogen ion gun (if applicable) may be used to blow the loose particles on the lens surface.
- Dip the lint free cloth in alcohol.
- Squeeze the excessive alcohol in the cloth or apply the lint free cloth on dry cloth lightly.
- Wipe the lens surface by making circular motion. Then discard the cloth.
- If it is necessary to repeat above step, please use new cloth to dip with the cleaning solution to wipe.

Instructions for Battery Charging

Use a USB cable to charge:

- This product has a built-in rechargeable battery.
- When the battery is low, “” will be displayed on the upper right of the screen. Please charge it through the Type-C USB interface in a timely manner.
- Unplug the USB cable after fully charging.

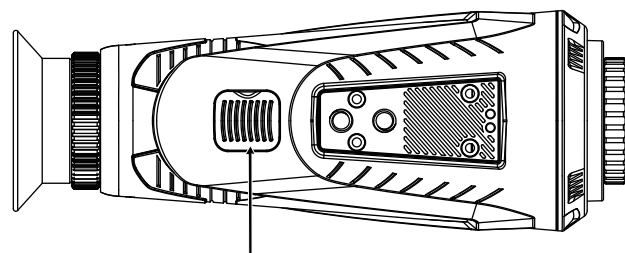
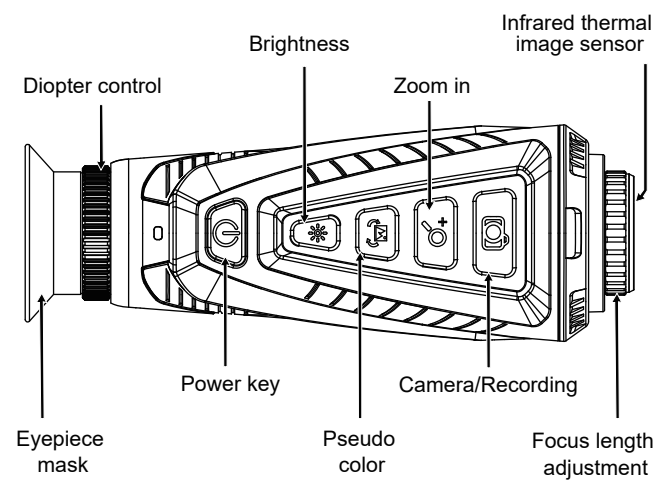
Performance Index

Infrared detector					
Detector Type	VOx vanadium oxide				
Resolution ratio	256×192				
Pixel size	12μm				
Working band	8~14μm				
NETD	<50mK @25℃, F#1.0, 25Hz				
Frame rate	50Hz				
Infrared objective					
Focus Mode	Manual				
F-factor	1.0				
Focal length	7mm	10mm	15mm	19mm	25mm
Viewing angle	26.3°×19.6°	16.1°×12.0°	11.1°×8.3°	14.5°×10.5°	10.7°×8.0°
Detection range					
Character	330m	472m	708m	897m	1180m
Wild boar	291m	417m	625m	792m	1042m
Vehicle	875m	1250m	1875m	2375m	3125m
Recognition distance					
Character	83m	118m	177m	224m	295m
Wild boar	73m	104m	156m	198m	260m
Vehicle	219m	312m	469m	593m	781m

Eyepiece	
Exit pupil distance	23mm
Diopter adjustment	-6D~4D
Focus range	5m-∞
Monitor	
Display screen type	OLED
Resolution ratio	1024×768
Display size	0.39 inches
System function	
Language	Simplified Chinese, Traditional Chinese, English
Electron zoom	1×/2×/4×
Pseudo color	White Hot, Black Hot, Red iron, Rainbow, Iron Red, Glimmer
Camera/video recording	Support
Picture in Picture	Support
WIFI	Support
Hot point track	Support
Storage	
Built-in storage	Built in 16G EMMC (system takes up some space, actual size is approximately 13.8G)
Pictures/Videos	JPG/MP4

Interface					
USB interface	TYPE-C export images, videos, and battery charging function, CVBS output				
Power supply					
Lion rechargeable	Built in 18650/2000mAh, non detachable				
Supply voltage	5V (USB)				
Duration time	≥6 hours				
Working/Storage Environment					
Working temperature	-20℃ ~ 60℃				
Storage temperature	-30℃ ~ 70℃				
Protection grade	IP65				
Size/Weight					
Overall dimensions	187*67*67mm				
Weight with battery (Lens)	435g (7mm)	440g (10mm)	450g (15mm)	460g (19mm)	470g (25mm)

Introduction to Product Structure



Before use, open the safety cover first) Type-C interface

Focus length adjustment: adjust the focus to make the image clearer.

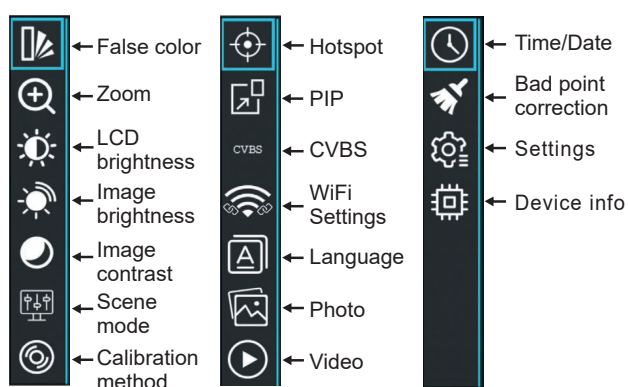
Type-C interface: used for charging batteries and connecting computers to view device photos and video files.

Diopter adjustment: adjust the visual acuity to suit you.

Key Description

Key/status		Press	Hold down
 Power key	Main interface	It can be configure as screen off or freeze frame of picture through the menu.	A shutdown prompt box pops up for shutdown operation
	Menu interface	——	——
 Brightness key	Main interface	Brightness adjustment	Refresh shutter
	Menu interface	Down	——
 Pseudo color key	Main interface	Pseudo color switching	Menu
	Menu interface	Enter	Return
 Zoom in key	Main interface	Zoom in (1x/2x/4x)	Turn on/off PIP
	Menu interface	Up	——
 Camera key	Main interface	Camera	Turn on/off recording
	Menu interface	——	——

Menu Description



PIP: Set on or off for the picture in picture function.

Scene mode: Standard, City, Jungle, or Custom modes can be selected. In the custom mode, setting can be made for image detail intensity (0~3) and denoising intensity (0~3) according to the value.

LCD brightness: : The display brightness can be adjusted to 1-10 levels.

Image brightness: The image brightness can be adjusted by 1-10 levels.

Image contrast: The contrast of the image can be adjusted to 1-10 levels.

Calibration method: The image correction method can be set to manual correction, automatic correction, and scene correction.

False color: White hot, black hot, red iron, rainbow, iron red, glimmer.

CVBS: Set the on or off of external screen CVBS.

Display description of the external screen:

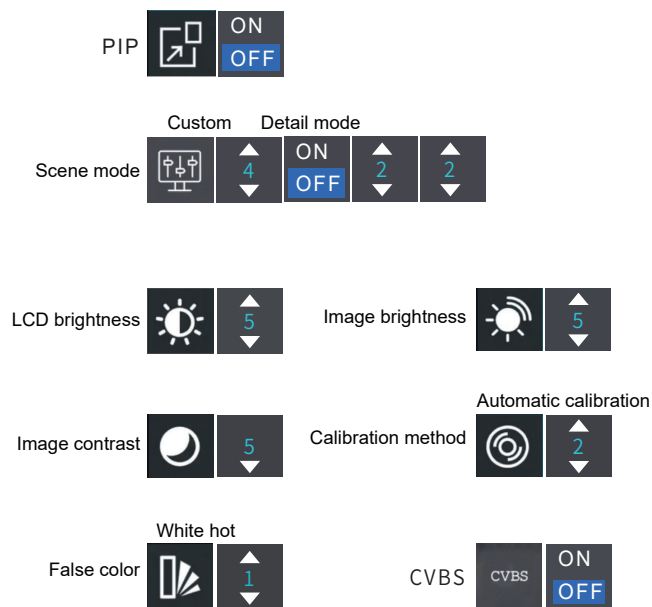
1. When connecting the external screen to the USB interface, you need to enter the menu to manually open CVBS, switch the machine video to the external screen display, and at the same time, turn off the internal screen video. External screen display is only video and does not support UI menu display;
2. Fake colors only support white heat and black heat.

Operation method:

- Hold down the pseudo color key to enter the menu;
- Press the zoom in key or brightness key (up or down) to select the desired setting item, and press the pseudo color key to enter the setting;
- When setting a value, press the brightness key (decrease) or zoom in key (increase). After the setting is completed, press the pseudo color key to return.

When entering the scene mode and selecting the custom mode, press the pseudo color key again to pop up the detail mode settings. Press the pseudo color key to select the detail mode, detail intensity, or denoising intensity. After selecting it, press the brightness key (decrease)

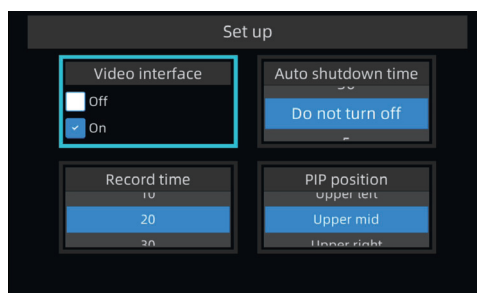
or zoom in key(increase) to set the numerical value. After setting is completed, hold down the pseudo color key to exit (when the detail mode is selected as off, it is edge mode setting), as shown in the following figure.



Settings: Set the power button short press function, recording interface, automatic shutdown time, recording duration, and picture in picture position.

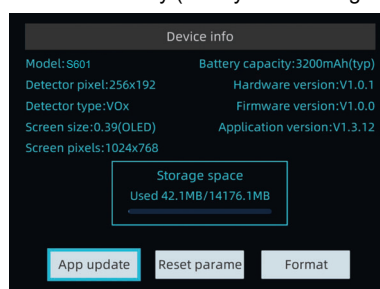
- Short press the power button: It can be configured as screen off or freeze frame of picture through the menu.
- Video interface: Set whether to bring UI display information when recording;
- Automatic shutdown time: May set no shutdown, 5 minutes, 10 minutes, 20 minutes, 30 minutes.
- Recording duration: Set the duration of each video file, including 5 minutes, 10 minutes, 20 minutes and 30 minutes;
- Position of picture in picture: Set the position of picture in picture in the center, which can be set as upper right, upper mid, upper left, lower right, lower mid and lower left.

Operation method: Press the pseudo color key to select the recording interface, automatic shutdown time, recording duration or picture in picture position, and then press the brightness key or zoom in key to set it. After setting is completed, Long press the pseudo color key to exit the setting, as shown in the following figure.



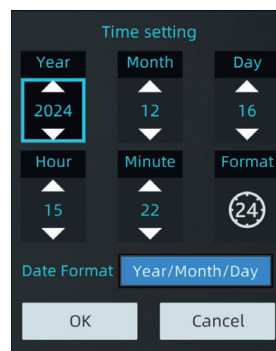
Device info: View the device model, hardware version, firmware version, application version, serial number, You can also update applications, reset parameters, and carry out format for the device as shown in the figure below.

- Application update: Update software.
- Reset parameters: restore the factory settings.
- Format: Clear disk memory (mainly stored images, videos).



Time/Date: Set the date (year, month, day) and time (hour, minute), time format (12-hour, 24-hour), and date format (year/month/day, day/month/year, month/day/year).

Operation method: Press the pseudo color key to select year, month, day, hour, minute, and then press the brightness key (reduce) or zoom in key (increase) to set it. Press the brightness key to convert the time and date formats. After setting, long press the pseudo color key to exit the time setting, as shown in the following figure.



Language: The language of the device can be set to Simplified Chinese, Traditional Chinese, English. After selecting the language, press the pseudo color to confirm and exit, as shown in the following figure.



Bad point correction: Manual bad point correction. After entering the bad point correction, press the pseudo color key or brightness key (Left or right), press the camera key or zoom in key (up or down) to adjust the cursor position, press the power key to confirm the removal of bad points, and hold down the power key to exit bad point correction.

Hotspot: Press the pseudo color key to set hotspot tracking, and press the zoom in key or brightness key (up or down) to select on or off.

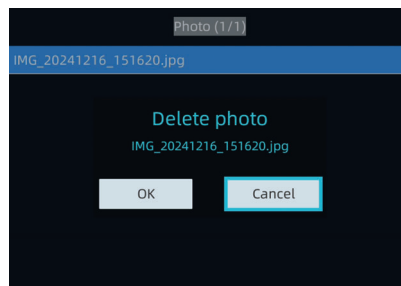
Photos and Videos

View photos: Select photos from the menu, open the photo list, and press the pseudo color key to view the photos. When viewing a photo, press the zoom in key to view the previous photo, and press the brightness key to view the next photo.

Photo deletion: In the photo list, pressing the camera key will prompt you to delete the photo. Press the brightness key or zoom in key to select "OK", and then press the pseudo color key to delete the image, as shown in the following figure.

View Video: Select Video from the menu, open the video list, and press the pseudo color key to view the video.

Delete video: In the video list, press the camera key to pop up a prompt to delete the video. Press the brightness key or zoom in key to select "OK", and then press the pseudo color key to delete the video.

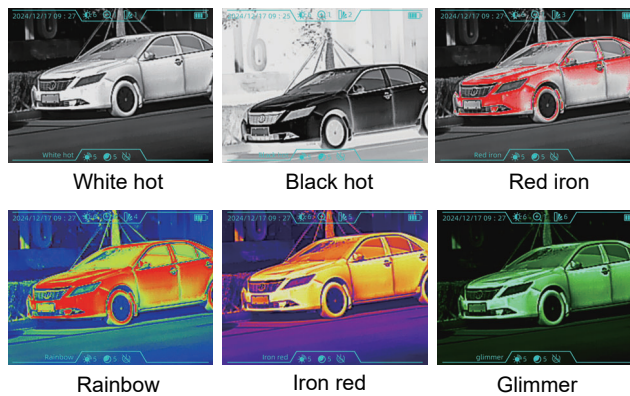


Introduction to the False Color

The color palette is divided into six types: white hot, black hot, red iron, rainbow, iron red, glimmer.

The false color can be used to change the pseudo color display of infrared images on the display screen. Some color palettes are more suitable for specific applications and can be set as needed. These color palettes work best with high thermal contrast, providing additional color contrast between high and low temperatures. Choosing an appropriate palette can better display the details of the target object.

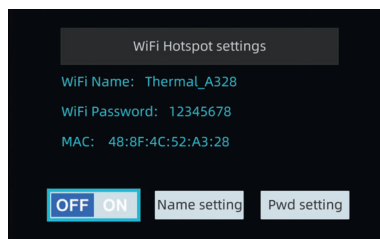
The following is a picture taken with the same object but different palettes selected:



WiFi Hotspot Settings

Find WiFi hotspot in the menu and hold down the pseudo color key to enter WiFi settings.

WiFi name, WiFi password, and MAC address can be found, and the name and password can also be adjusted as shown in the following figure.

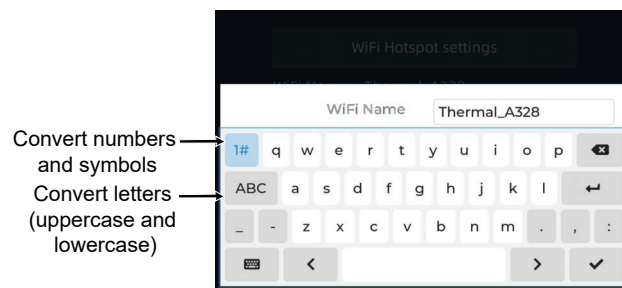


Operation method: After entering WiFi hotspot settings, press the zoom in key or brightness key (left or right) to select WiFi on/off, name settings, and password settings.

WiFi on/off setting: Press the pseudo color key to set on or off.

WiFi name and password settings: Press the pseudo color key to enter, press the pseudo color key or brightness key (left or right), press camera key or zoom in key (up or down) to select letters.

Select and press the power key to confirm. After the setting is completed, select "\n" and press the power key to confirm and exit the name settings, as shown in the following figure.



Connecting WIFI Hotspot

Using this Thermal Imaging Telescope, need to download and install the Thermal Imaging Telescope "Thermal imaging telescope" APP to achieve infrared observation through this APP. Attention should be paid to the normal use of the APP: 1. Ensure that the phone has OTG function; 2. Ensure that the OTG function is turned on.



Scan QR code to download the App

Connect the device hotspot after the device is powered on.
The default connection hotspot name for this device is Thermal_XXXX (XXXX is the last four digits of the device MAC), password: 12345678.
Open the APP software to enter the interface, the interface is displayed as follows:



“” Gallery, view pictures and videos.

When entering the picture list/video list, check the picture/video and click “” at the top right to delete or share the picture/video.

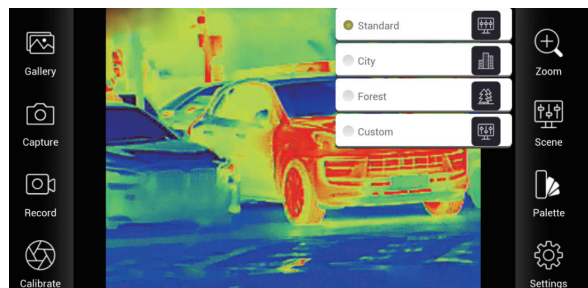
“” Snap the image.

“” Record, click this icon to record video, click again to end recording.

“” Refresh, refresh block.

“” Zoom, Can be enlarged 1x, 2x, 4X.

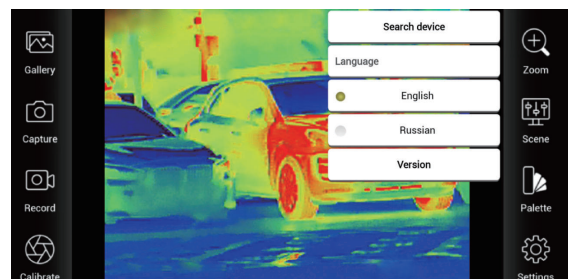
Click the “” icon to replace the scene. It can be set to standard, city, forest, custom, As shown below.



Click the “” palette icon, which can be set to white hot, black hot, red iron, rainbow, iron red, glimmer six color palettes.



Click “” to set icons, search device, devices list, switch between Russian and English languages, view the version information, As shown below.



Search device: Search the current device and automatically connect.

Equipment list: Enter the device list, click search, and when you search for multiple devices, select the device you need to connect in the list.

Version information: View version information.

Note: When the default hotspot is used for the first time, connect the default hotspot.

FCC Caution :

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.

Any 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.

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

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