TNC225R

THERMAL NIGHT-VISION COMPACT 225 LRF

THERMAL NIGHTVISION MULTI-SPECTRUM SCOPE

CONTENTS

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SAFETY INSTRUCTIONS

◉ INFRARED (IR) Illuminator is very powerful. Do not look directly into the light to avoid damage to your eyes.

◉ Switch off the IR Illuminator when not in use. Continuous use of IR light will generate excessive heat. Avoid pointing it towards flammable objects.

◉ Do not point the device at strong light sources such as the sun, open flames, etc, as this may cause damage to thermal sensor.

◉ Device operating temperature -4F-122F (-20~50℃).

◉ Please contact us if there are malfunctions, Please do not attempt to disassemble the scope.

DESCRIPTION

TNC225R is a Thermal Nightvision multiple spectrum digital scope that can be used 24/7 in all-weather conditions. Digital Nightvision combined with a thermal sensor enables faster target detection with the benefit of a high quality digital image for identification.

PACKAGE CONTENT

● TNC225R Scope

● Eye Cup

● Mount Accessories (M5 screws, mount, allen wrench, lens cleaning cloth)
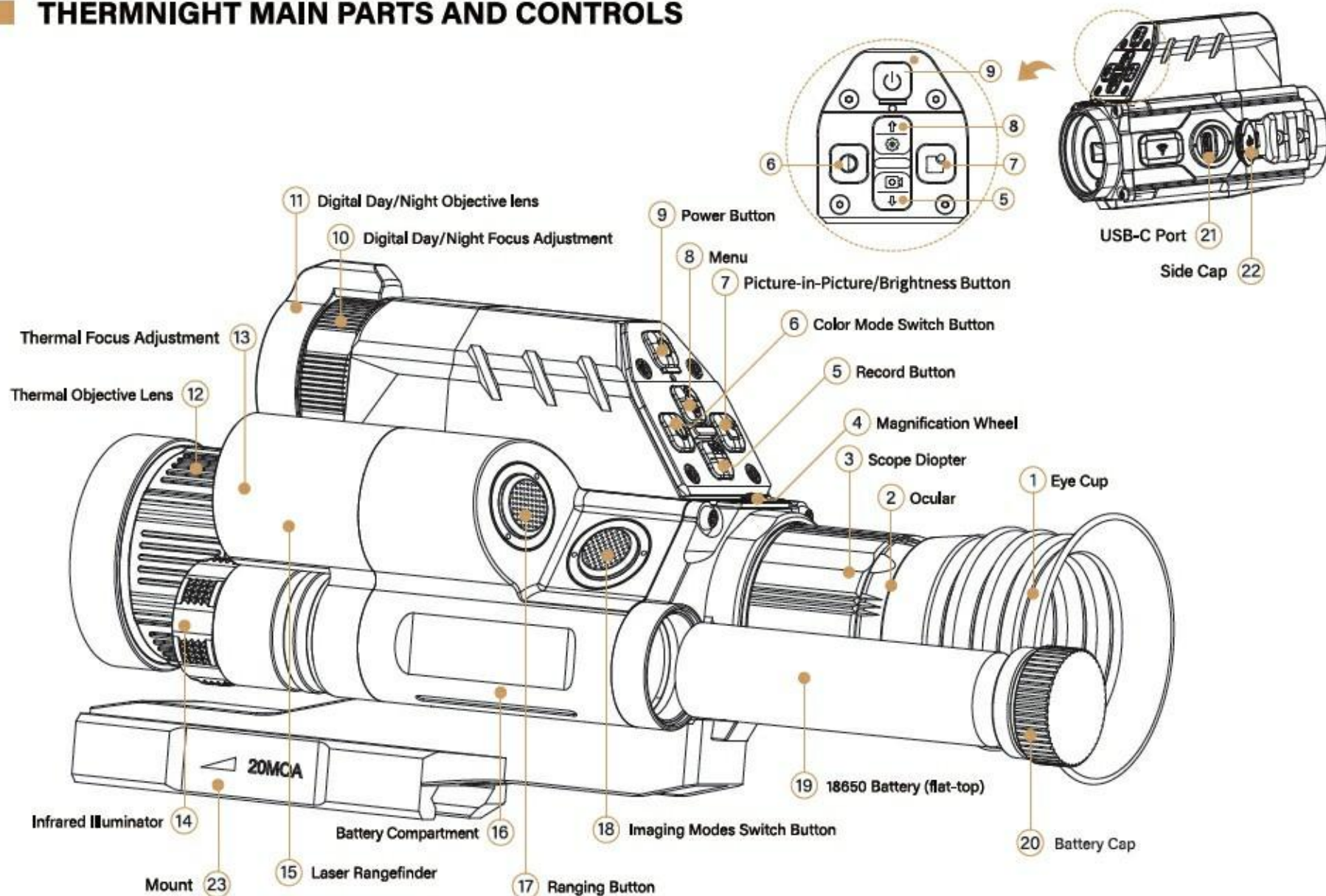
● USB Cable

● User Manual

SPECIFICATIONS

Model	TNC225R

Physical Specifications

Net Weight	632g
Dimensions	170 * 79 * 77mm
Storage	Built-in Storage, 32GB
WIFI/APP	Support
Bluetooth	support
Laser Rangefinder Maximum Detection Range	5 - 1200m
Operating Temperature	-20~50°C
Ingress Protection	IP67
Impact Resistance	800Gs

Display Specifications

Type	Micro-OLED
Display Resolution	1024x768pixels
Frame Rate	50FPS

Power Specifications

Battery Type	18650 Battery (flat top type)
Operating Time	5h
External Power Supply	5V – Type C USB

Digital Channel

Sensor Specifications	Resolution	1920x1080pixels
	Frame Rate	60FPS
	Video Record Resolution	1024x768pixels
Optical Specifications	Focal Length of Objective Lens	52mm
	Base Magnification	5x
	Digital Zoom	1x, 1.5x, 2x, 2.5x, 3x, 3.5x, 4x
	Eye Relief	45mm
	Diopter Adjustment	±5D
	IR Wavelength	850/940nm
	IR Illuminator Power	3W
	Sight Range	400m

Thermal Channel

Sensor Specifications	Resolution	256x192pixels
	Sensor	Uncooled Infrared Sensor
	Frame Rate	50FPS
	Pixel Size	12x12um
	NETD	≤25mk @25°C
	Focal Length of Objective Lens	25mm
	Base Magnification	3x
	Digital Zoom	1X, 2X, 3X, 4X

FEATURES

- Three imaging modes: Day/Night mode, Thermal mode, and PIP with Day/Night & Thermal combined mode.

- Video recording resolution: 1024*768 at 30 fps.

- Ultra HD image quality, Micro-OLED 1024*768 display at 30 fps.

- Full screen recording including on screen display, reticle, LRF read out etc.

- One shot zero.

- Picture-in-Picture.

- Reticle Zeroing in Picture-In-Picture mode.

- Laser rangefinder connects to Ballistics APP for ballistic solution.

- Digital channel image & thermal channel image alignment.

- Removable IR illuminator.

- 3-Axis Gyroscope.

THERMNIGHT MAIN PARTS AND CONTROLS

- 11 Digital Day/Night Objective lens
- 10 Digital Day/Night Focus Adjustment
- 9 Power Button
- 8 Menu
- 7 Picture-in-Picture/Brightness Button
- 6 Color Mode Switch Button
- 5 Record Button
- 4 Magnification Wheel
- 3 Scope Diopter
- 2 Ocular
- 1 Eye Cup

- 13 Thermal Focus Adjustment
- 12 Thermal Objective Lens

- 21 USB-C Port
- 22 Side Cap

- 19 18650 Battery (flat-top)
- 18 Imaging Modes Switch Button
- 17 Ranging Button
- 16 Battery Compartment
- 15 Laser Rangefinder
- 14 Infrared Illuminator
- 23 Mount
- 20 Battery Cap

20MOA

POWER SUPPLY

This device is powered by an external 18650 battery (flat-top) with up to 5 hours of operation time (when the IR Illuminator is turned off). The TNC225R can be out using a USB power supply. The USB-C port does not charge the 18650 battery. Remove the 18650 battery if using USB power.

Note: The TNC225R cannot charge the 18650 battery.
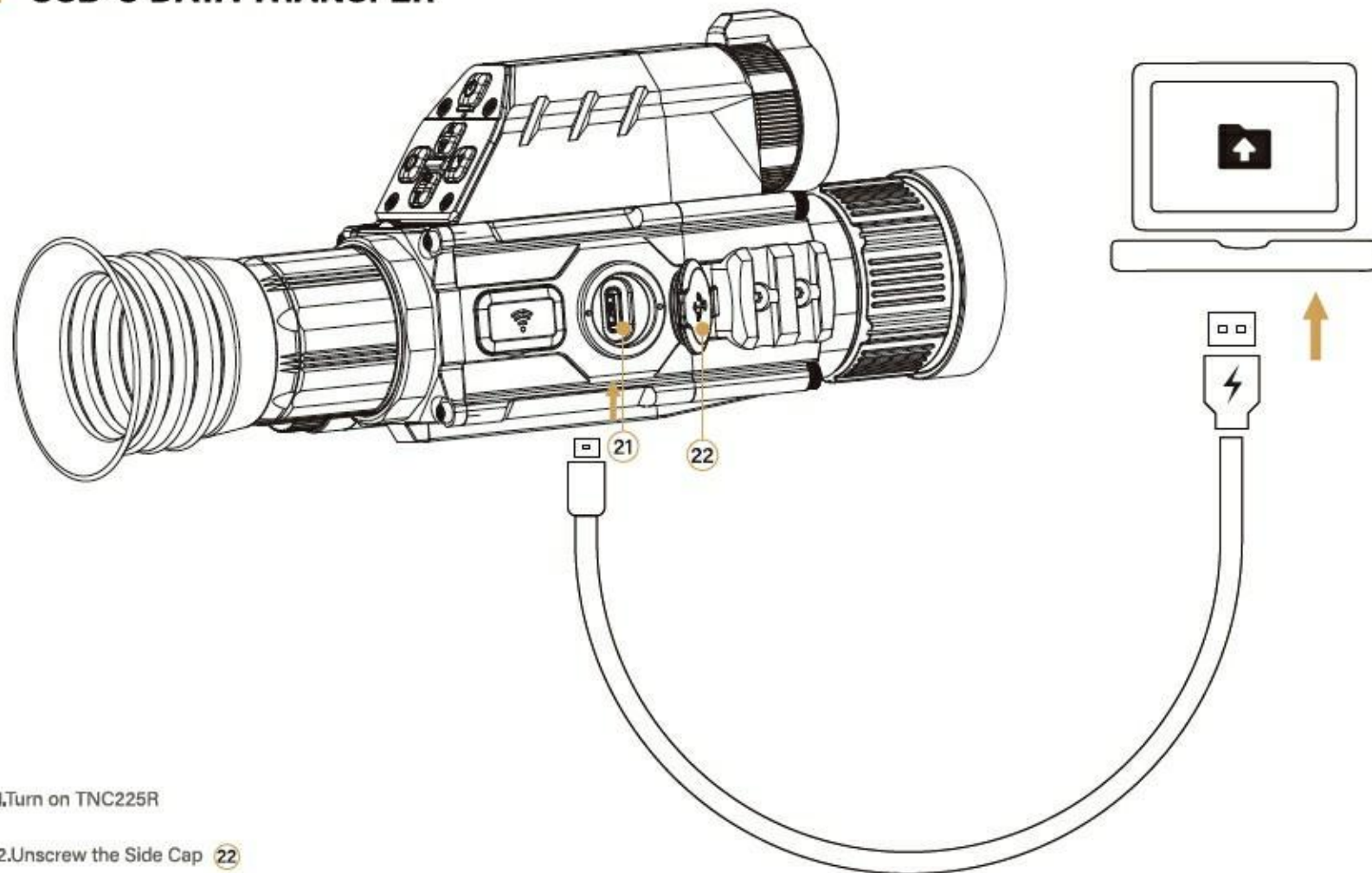
Installing the 18650 Battery
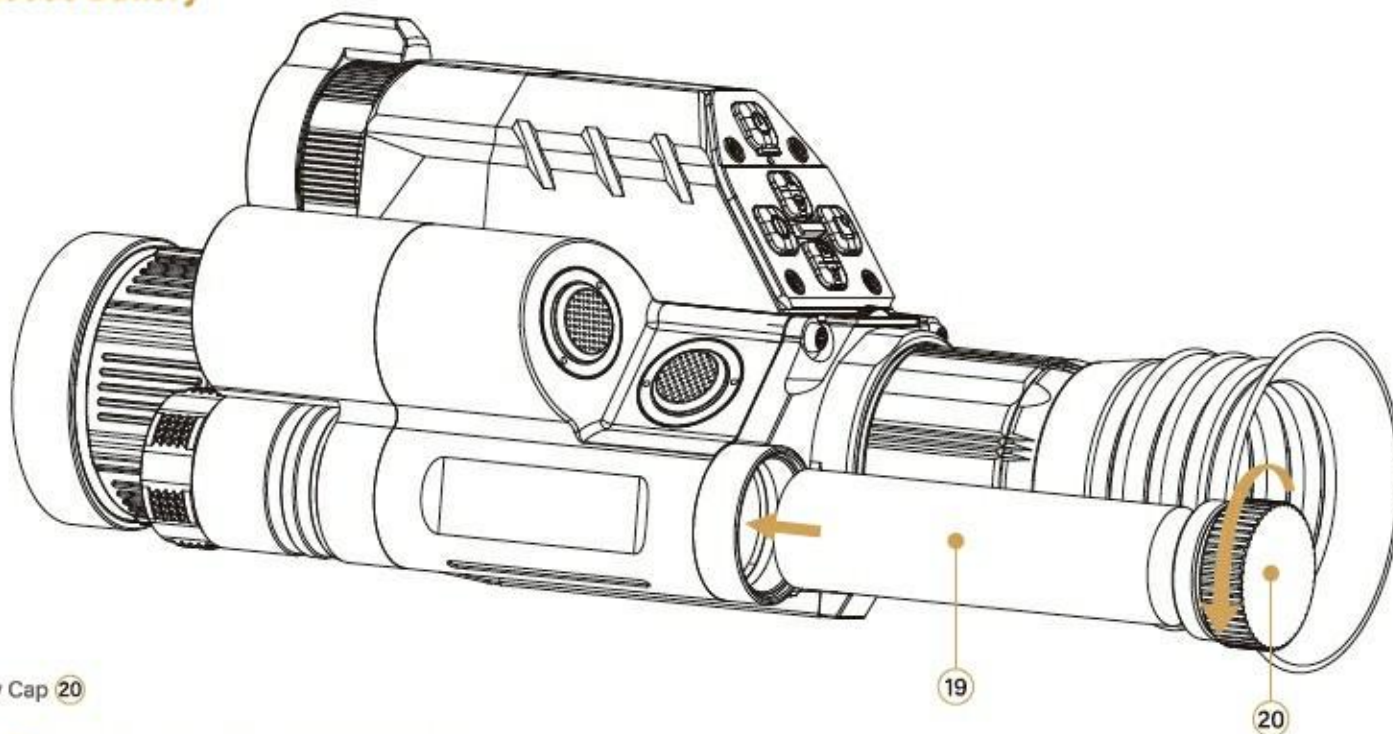
Unscrew the Battery Cap ⑳

Insert 18650 battery ⑲ into battery compartment, postive side first

Screw the Battery Cap tight ⑳ till the end of thread

USB-C DATA TRANSFER

1.Turn on TNC225R

2.Unscrew the Side Cap (22)

3.Plug USB-C cable into TNC225R USB-C port. (21) The TNC225R will conect to your computer like a USB drive. You can browse and download video recordings to your computer as well as transfer files from your computer to the TNC225R.

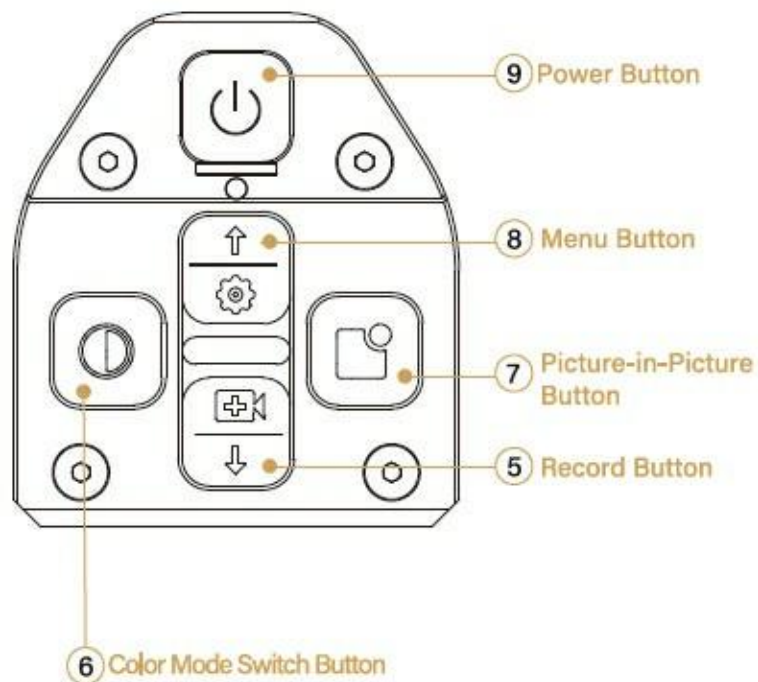Note: When connected with laptop/PC, find the DNT drive to check the video clips under its directory.

■ REMOVEABLE INFRARED ILLUMINATOR (IR TORCH)

Adjustment of beam size

Install / Remove IR Torch
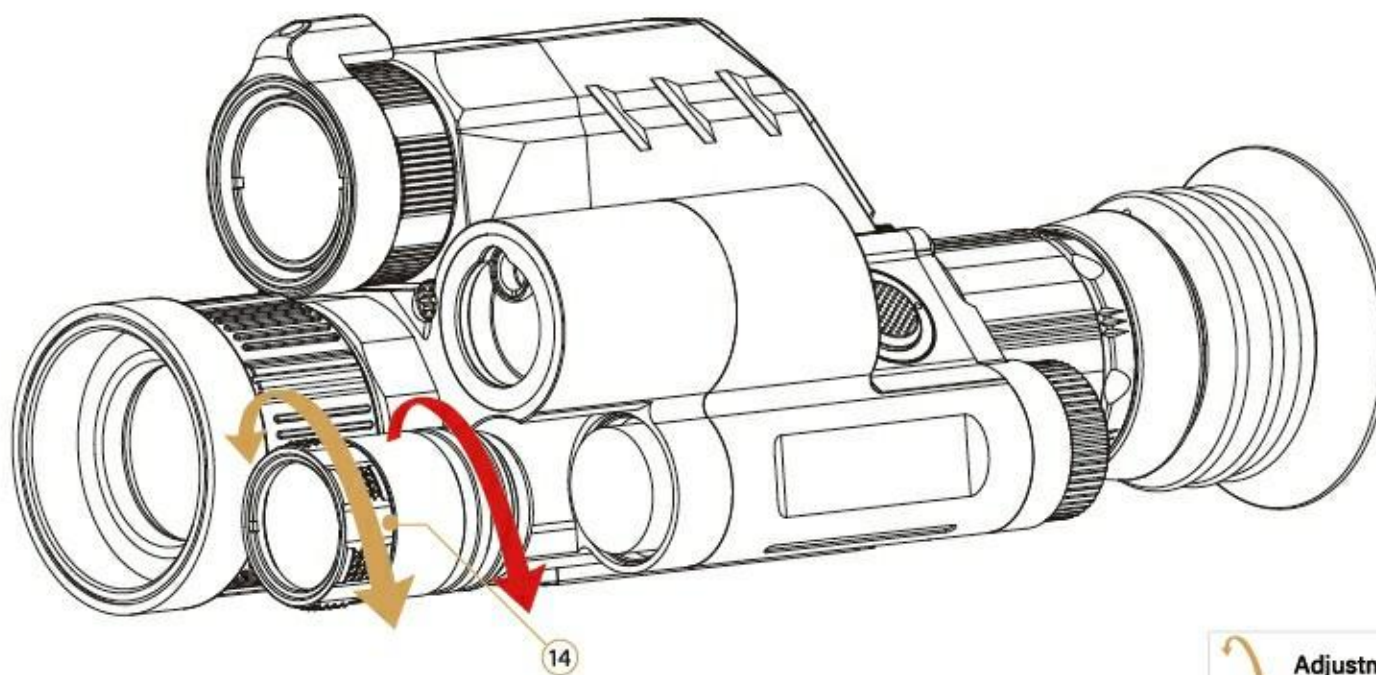
Rotate the IR Illuminator counter clockwise to remove from TNC225R body. Rotate clockwise to re-install IR Illumiantor. IR head will move in and out to adjust beam size and intensity of focus.

Note: The scope is compatible with the 850nm or 940mm wavelength IR Illuminator (14)

CONTROLS DESCRIPTION

(9) Power Button
(8) Menu Button
(7) Picture-in-Picture Button
(5) Record Button
(6) Color Mode Switch Button

Button	Status	Short press	Long press
⏻ (9)	Off	–	On
	On	Standby	Off
	Standby	Wake-up	–
	Reticle Zeroing	Freeze/Continue	–
⚙ (8)	On	Reticle Color Switch	Enter the Menu Interface
	Menu	Move cursor up	–
	Zeroing	Reticle X/Y value adjust once	Reticle X/Y value adjust continuous
◐ (6)	Thermal mode	Switch the Thermal Channel	NUC (Non–Uniformity–Correction)
	Day Mode	–	Black/White Mode
	Night Mode	IR Brightness Adjust	Color Mode
	Menu Interface	Back to the previous screen	–
	Zeroing Interface	Move cursor to the left	Exit without saving
▣ (7)	On	Screen Brightness Adjust	Picture-in-Picture On/Off
	Menu	Confirm	–
	Zeroing	Move cursor to the right	Save and Exit
▣ (5)	On	Start RAV Recording (manual mode)	Start/End Recording
	Menu	Move cursor down	–
	Reticle Zeroing	Single increment adjustment	Continuous adjustment

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CONTROLS DESCRIPTION

④ Magnification Wheel

⑱ IR Mode Switch Button

⑰ Ranging Button
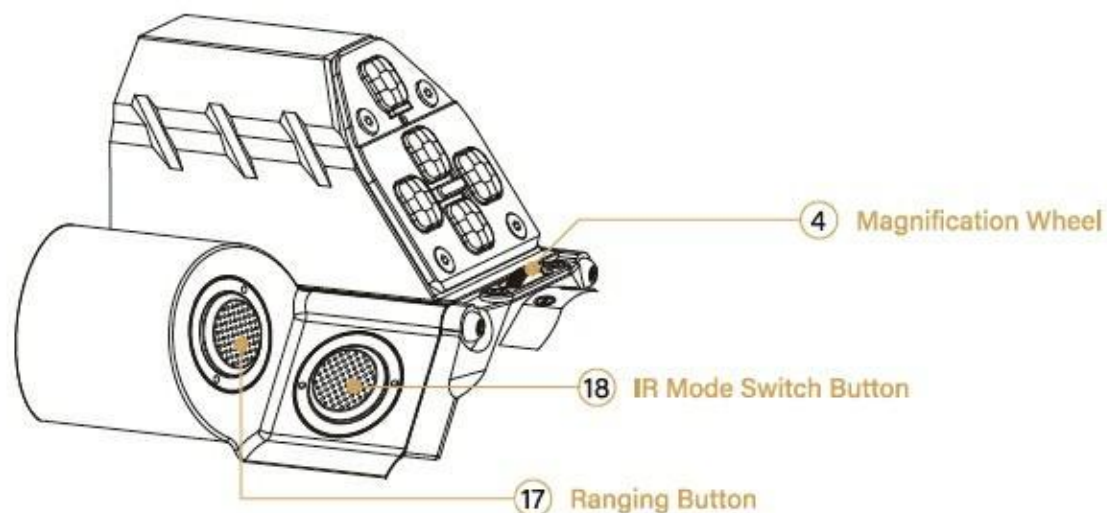
Button	Status	Short press	Long press	Rotation
④	On	–	–	Spin to the right increase the magnification/ the left decrease the magnification
	Reticle Zeroing Interface	–	–	Spin to the right increase the magnification/ the left decrease the magnification
⑰	Not connected to App	Show/Hide ranging icon and distances	Turn off ranging	--
	Zeroing InterfacConnected to APP Bluetoothe	Ranging and Ballistic Calculation	Turn off ranging	--
⑱	On	Switch Nightvision /Thermal Channel	–	--
	Picture-In-Picture Mode Enabled	Switch small and large window channels display	–	--

# ON SCREEN DISPLAY

00:00:00
200M
0.0
0.0
12:10:38

4.0X
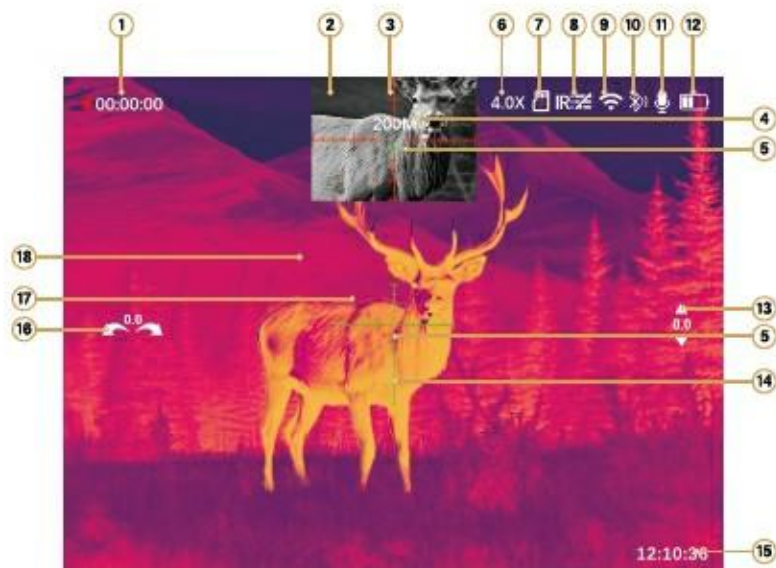
① Recording indicator: The recording timer indicates that the device is currently recording. The displayed number on the timer represents the duration of the recorded video.

② Picture In Picture window (Nightvision or Thermal)

③ Small window reticle

④ Range reading

⑤ Small window Ballistic Calculation Point of Aim

⑥ Current magnification (e.g. 4.0x)

⑦ Storage status (Shows up only at storage fail conditions)
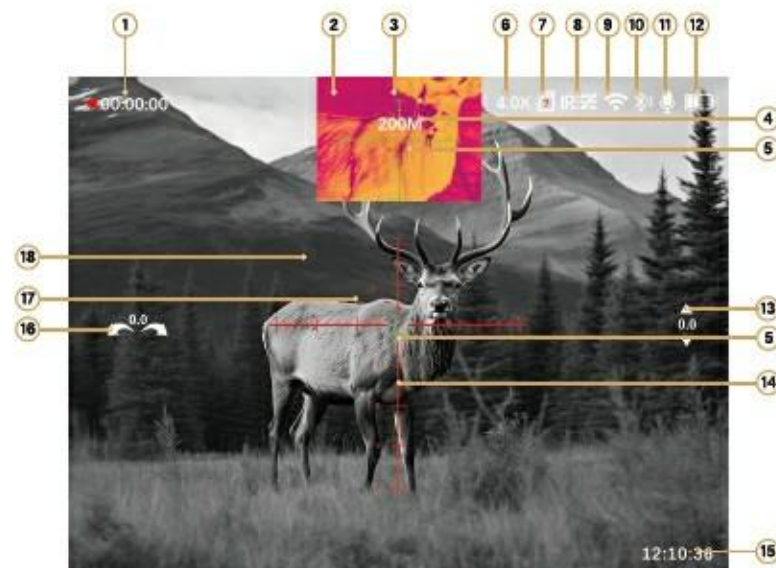
⑧ The IR icon indicates you are in Nightvision mode. The image will be black/white. The bars on the right indicate the IR Illuminator status and brightness.

IR	Black/White Mode; Illuminator off
IR	Black/White Mode; Brightness Level 1
IR	Black/White Mode; Brightness Level 2
IR	Black/White Mode; Brightness Level 3

INTERFACE DESCRIPTION
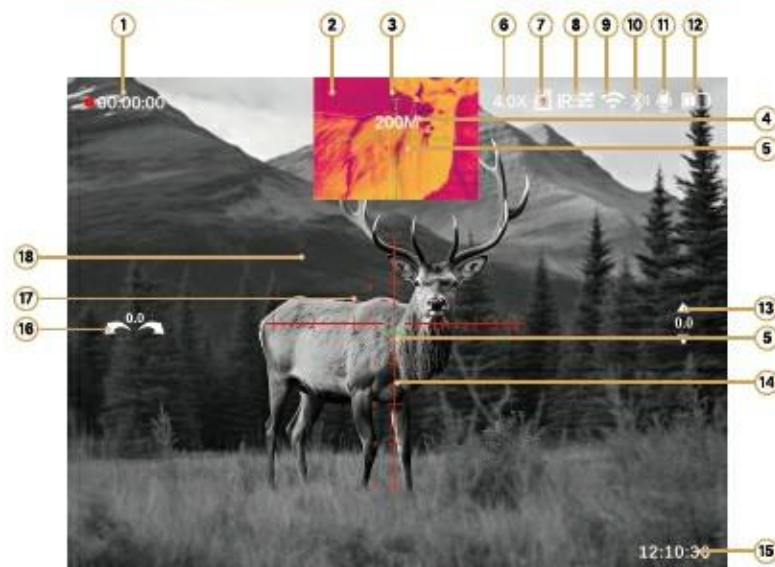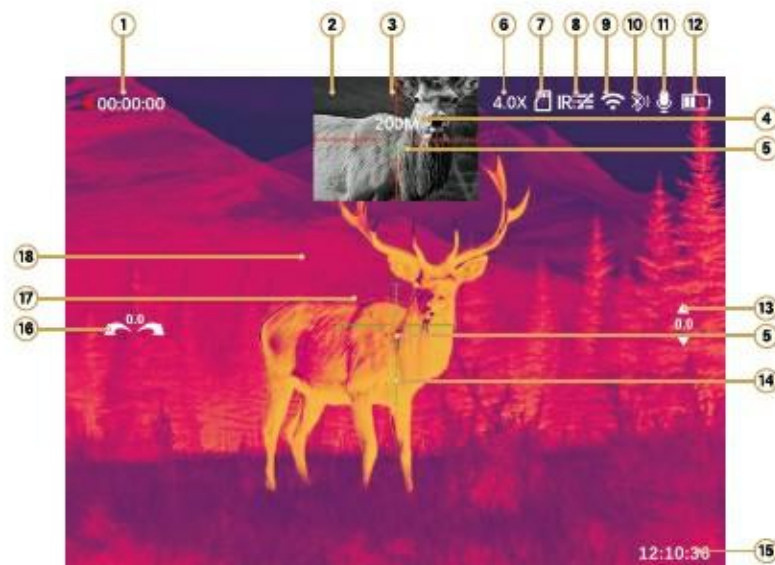
⑨ WiFi (📶 WiFi on, 📵 WiFi off)

⑩ Bluetooth (ᚎ Bluetooth on, ᚎ Bluetooth off, ᚎ Bluetooth connected)

⑪ Microphone, Indicates whether sounds to be included when recording

(🎤 Microphone on, 🎤 Microphone off)

⑫ Battery status

Icon	Status	Battery Status
▯	1 bar	10% ~ 20%
▮▯	2 bars	20% ~ 50%
▮▮▯	3 bars	50% ~ 80%
▮▮▮▮	4 bars	80% ~ 100%
⊷▯	charging	connected to USB power supply

⑬ Inclinometer

⑭ Reticle

⑮ Current time

⑯ Level indicator

⑰ Ranging reticle

⑱ Primary display in Digital Night Mode with Picture-In-Picture secondary display (5) in Thermal.

MENU LIST

Long press **Menu Button** (8) for 2 seconds to enter Menu List; There are 12 selections in total. Short press **Menu Button** (8) to move up, short press **Record Button** (5) to move down, short press **Color Mode Switch Button** (6) to go back and exit. Short press **PIP/brightness Button** (7) to enter and confirm selection.
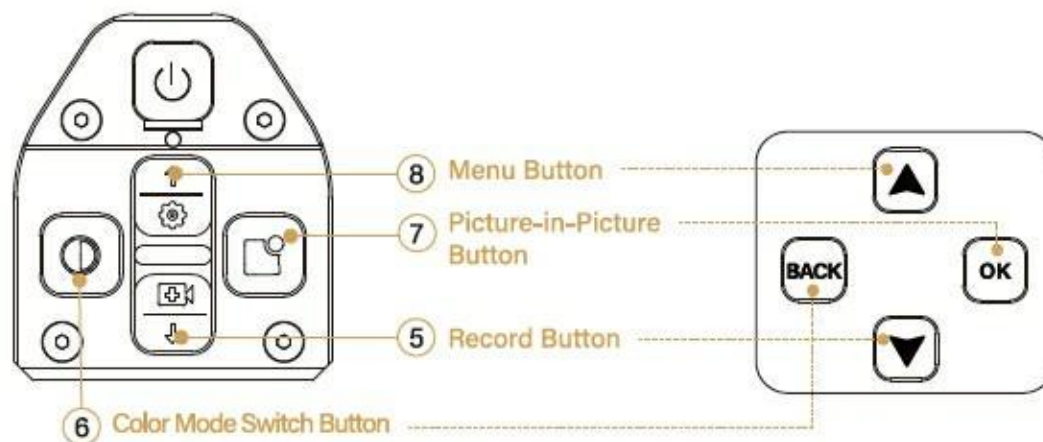

(main screen)

Long Press 2s

(menu)

(8) Menu Button

(7) Picture-in-Picture Button

(5) Record Button

(6) Color Mode Switch Button

■ MENU LIST

Long press **Menu Button** ⑧ for 2 seconds to enter Menu List, and there are 12 selections as below chart.

| Icon	Description
	【Screen Brightness】 Adjust the screen brightness, 1 to 5.
	【Connections】 WiFi and Bluetooth settings.
	【Reticle Zeroing】 Reticle zeroing
	【Digital/Thermal Switch】 Set Thermal Channel, Digital Channel, or Dual Mode (PIP).
	【Ballistic Calculation】 Real-Time or Ballistic Table Calculation Aiming Method Settings: Holdover or Dial-In .
	【color Enhancement】 Set the digital channel screen as natural image and Pseudo-color enhancement image.
	【Thermal Imaging Mode】 Set the thermal imaging mode to Natural, Enhanced and High Brightness.
	【Thermal Imaging Image Configuration】 Set thermal image color mode, Image Contrast, Image Brightness, Image Sharpness, Thermal Hotspot Tracking, and Dead Pixel Correction.
	【Recoil Activated Recording】 Set the recoil activated recording function to auto or manual.
	【Audio NO/OFF】 Turn microphone on or off for audio recording embedded in video.
	【Function Setting】 Set the time of Auto Power Off, the time of Loop Recording, the position of the Picture-in-Picture Window, Gyroscope, and the selection of the Range Units.
	【System Setting】 Set the Screen Shifting, Time Stamp Switch in recording, Date and the Current Time, Language Setting, Format the TF card, restore the Factory Default Setting, Available Storage Query, Current Version.

MAIN FUNCTION DESCRIPTION

Zeroing The Reticle

Long press the **Menu Button** ⑧ for 2 seconds to enter Menu List, short press the **Record Button** ⑤ to move down to the **Reticle Setting Menu** press the **Color Mode Switch Button** ⑥ to enter the select Reticle setting interface.

- Short press the **Picture-in-Picture Button** ⑦ to move the cursor to the right, short press the **Color Mode Switch Button** ⑥ to move the cursor to the left;

- Short press **Menu Button** ⑧ to increase current value by 1, long press (without release) to continuously increase the current value short press **Record Button** ⑤ to decrease the current value by 1, long press (without release) to continuously decrease the current value.

- Long Press **Picture-in-Picture Button** ⑦ for 2 seconds to save and exit Reticle Zeroing; long press **Color Mode Switch Button** ⑥ for 2 seconds to exit without saving.

- Short press on **Power Button** ⑨ to freeze/unfreeze current image.
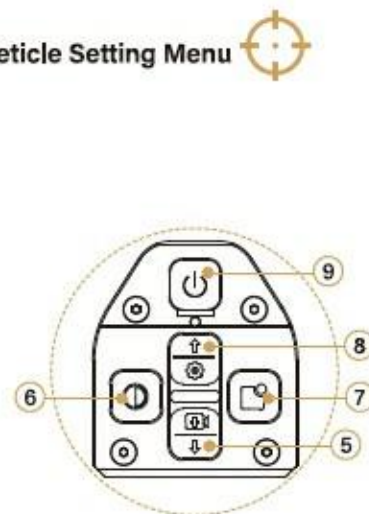
① 4.0x: the current objective magnification, adjustable with Magnification knob(4)

② Thermal Imaging: indicates the reticle zeroing of the thermal channel is currently in progress, thermal channel/digital channel available

③ A: current Ballistic profiles, up to 26 (A–Z) profiles for reticle setting

④ X=0: current horizontal position of reticle

⑤ Y=0: current vertical position of reticle

⑥ Color: Reticle color: white , green, red, yellow, or black

⑦ Styles: MILS, open dot crosshair, Duplex, German open T, + small cross

Thermal Channel Reticle Zeroing (Example)

Step 1: Aim at target at preferred zeroing distance. Adjust the **Thermal Objective lens** ⑫ so target is in focus. Align reticle on target. Shoot one round at target, the bullet will impact on or near the target. For example, impact point (T) as shown in Figure (1).

Step 2: Keeping your TNC225R steady and reticle aimed at your original aiming point, short press the **Power Button** ⑨. This will freeze the current image making it easier to zero the reticle.

Step 3: Use the **PIP/Brightness Button** ⑦ to move over and highlight X. Press **Menu Button** ⑧ to move reticle to the right. Press **Record Button** ⑤ to move reticle to the left. Move reticle to bullet impact if it is in the FOV of the frozen image.

Step 4: Press **PIP/Brightness Button** ⑦ to move and highlight Y. Pressing **Menu Button** ⑧ will move reticle up. Pressing **Record Button** ⑤ will move reticle down. Move reticle to point of impact.

Step 5: Long press **Color Mode Switch Button** ⑥ to exit without saving. Long press **PIP/Brightness Button** ⑦ to save and exit.

Figure (1)

Figure (2)

Digital Channel Reticle Zeroing (Example)

Step 1: Aim at target at preferred zeroing distance. Adjust the **Objective lens** ⑫ so target is in focus. Align reticle on target. Shoot one round at target, the bullet will impact on or near the target. For example, impact point (T) as shown in Figure (1).

Step 2: Keeping your TNC225R steady and reticle aimed at your original aiming point, short press the **Power Button** ⑨ . This will freeze the current image making it easier to zero the reticle.

Step 3: Use the **PIP/Brightness Button** ⑦ to move over and highlight X. Press **Menu Button** ⑥ to move reticle to the right. Press **Record Button** ⑤ to move reticle to the left. Move reticle to bullet impact if it is in the FOV of the frozen image.

Step 4: Press **PIP/Brightness Button** ⑦ to move and highlight Y. Pressing **Menu Button** ⑧ will move reticle up. Pressing **Record Button** ⑤ will move reticle down. Move reticle to point of impact.

Step 5: Long press **Color Mode Switch Button** ⑥ to exit without saving. Long press **PIP/Brightness Button** ⑦ to save and exit.

Figure (1)

Figure (2)

Dual Mode Reticle Zeroing (Example)

Turn on the Picture-in-Picture function:

Step 1: Aim at target at preferred zeroing distance. Adjust the **Objective lens** ⑫ so target is in focus. Align reticle on target. Shoot one round at target, the bullet will impact on or near the target. For example, impact point (T) as shown in Figure (1).

Step 2: Keeping your TNC225R steady and reticle aimed at your original aiming point, short press the **Power Button** ⑨ . This will freeze the current image making it easier to zero the reticle.

Step 3: Use the **PIP/Brightness Button** ⑦ to move over and highlight X. Press **Menu Button** ⑧ to move reticle to the right. Press **Record Button** ⑤ to move reticle to the left. Move reticle to bullet impact if it is in the FOV of the frozen image.

Step 4: Press **PIP/Brightness Button** ⑦ to move and highlight Y. Pressing **Menu button** ⑧ will move reticle up. Pressing **Record Button** ⑤ will move reticle down. Move reticle to point of impact.

Step 5: Long press **Color Mode Switch Button** ⑥ to exit without saving. Long press **PIP/Brightness Button** ⑦ to save and exit.

Note: Once you have zeroed both the digital and thermal channels at your preferred distance, targets closer or further than your zero distance will cause the aiming points of the digital and thermal to be different.

Figure (1)

Figure (2)

Screen Shifting

Long press **Menu Button** ⑧ for 2 seconds to enter the menu, move the cursor to **"System Setting"-"Screen Shifting"**, short press **Color Mode Switch Button** ⑥ to enter the image drift interface:

- Short press **Color Mode Switch Button** ⑥ or **Picture-in-Picture Button** ⑦ to move the digital-channel screen, when the digital target and thermal target are the same, long press for 2 seconds after **Picture-in-Picture Button** ⑦ to save the current setting.

(Before image drift)

(After image drift)

Picture-in-Picture Function

The small secondary window default size is 10% of the main screen. You can have the PIP window in the upper left, center, or upper right of the main screen. To change PIP position, enter the Menu: **Function Setting - Position of small window in Picture-in-Picture - Left / Center / Right.**

(Left)

(Center)

(Right)

Picture-in-Picture Function

● **Dual Mode**

While in Dual Mode, short press of the **Imaging Modes Switch Button** ⑱ will toggle the displays for the main screen and PIP window. See Figure (1), Main screen shows thermal channel while the PIP window is displaying night mode digital channel. Pressing the **Imaging Modes Switch Button** ⑱ will flip the displays Figure (2) so the main screen shows the digital night mode and the PIP window shows the thermal channel.

While in Dual Mode, spinning the **magnification wheel** ④ will only change the magnification of the main display. the PIP window will remain unchanged .

Note: In this mode, short press the Nightvision/Thermal **Imaging Modes Switch Button** ⑱ , you can switch from Figure (1) to Figure (2).
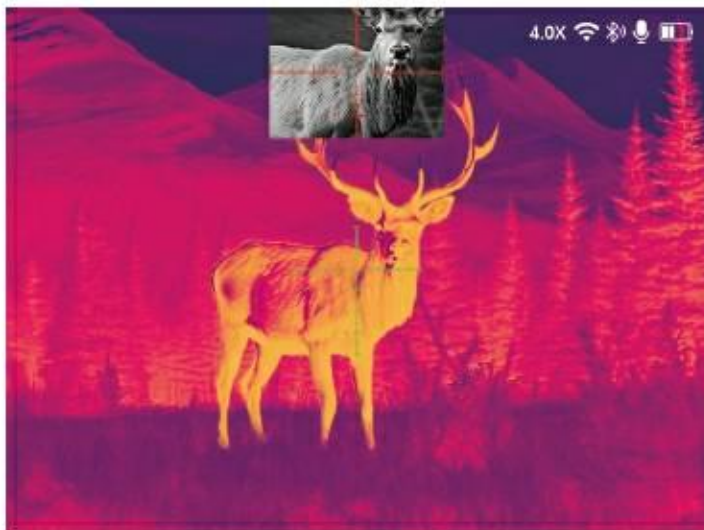

Figure (1)

Figure (2)

Picture-in-Picture Function

- **Nightvision Channel/Thermal Channel**

  In this mode, the small window magnification defaults to 2 times that of the large window.

Note: In this mode, short press the **Nightvision/Thermal Switch Button** (18) , you can switch from Figure (1) to Figure (2).

Figure (1)

Figure (2)

Range Finding

The LRF will only measure the distance, if you have the Ballistics Calculation set to OFF or the scope is not connected to the Ballistics App with Bluetooth.

- Short press the **Ranging Button** to turn on the distance measuring function. The Ranging Icon ⑰ shows up with current targeting distance range reading ④.
  (It will automatically and continuously measure the distance once the distance until you press the ranging button again to turn the LRF off.)

- another short press or long press the **Ranging Button** for 1.5 seconds to turn off the distance measurement function. The Ranging Icon ⑰ and distance range reading will disappear from the screen.

(First short press Ranging Button)

(Long press Ranging Button for 1.5 seconds)

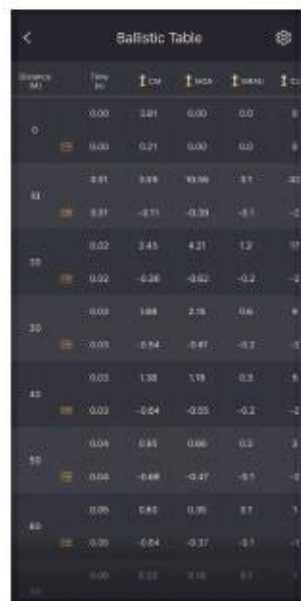## Ballistic Calculation-Real Time Calculation

- Go into Ballistic Calculation Menu and select "Real-Time Calculation". Make sure your phone's Bluetooth is on.

- Connect the TNC225R via Bluetooth to the App.

- Once connected leave the App open on the main page.

- Range your target by pressing the **Range Button** on the TNC225R. The App will calculate the ballistic drop for the distance provided by the LRF and send the information back to the TNC225R. If you have Hold Over set, there will be a small box showing you where to aim. If you chose Dial-In for your Aiming Method, the reticle will shift position for your new aiming point.

  Note: Your phone running the Ballistics App needs to be on and awake. If it sleeps, the App will stop calculating your ballistics.

Ballistic Calculation - Ballistic Table

- Enter the menu, press the Ballistic Calculation and select " Ballistic Table" make sure the Bluetooth is on and connected to the device (when there is a Ballistic Table on the device you don't need to turn on the Bluetooth to acquire profile from the APP).

- Click the Send icon ✈ to update the APP Ballistic Table to the device. After the profile is sent, the TNC225R will calculate the ballistics without needing to be connected to the App.

Note: Ballistic Calculation only works if you create a ballistic profile based on your gun and ammunition.

(BC Ballistic Table interface)   (Customized Ballistic Table interface)

Aiming Method-Holdover

Enter the menu, select "**Ballistic Calculation**" - "Aiming Method" - "Holdover".

- First short press the **Ranging Button** to activate the ranging function, the Ranging Icon (17) and distance (4) will display on the screen.
  - Aim the Ranging Icon at your target. The distance will be displayed at the top of the screen. Press the **Ranging Button** again to accept the distance so the Ballistic Calculator creates an aiming solution.
  - The Ranging Icon (17) will be replaced with the **Calculated Aiming Point**. Align the new **Calculated Aiming Point** at your target.
- Long press the **Ranging Button** for 1.5 seconds to turn off the Laser Range Finder.
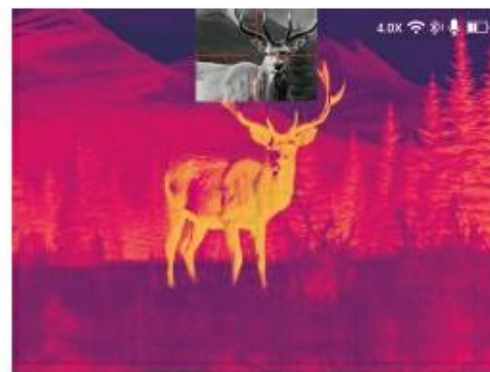

(First short press Ranging Button)

(Second short press Ranging Button)

(Third short press Ranging Button)

(Long press Ranging Button for 1.5 seconds)

Aiming Method-Dial in

Enter the menu, select "**Ballistic Calculation**" - "Aiming Method" - "Dial in".

● First short press the **Ranging Button** to activate the ranging function, the Ranging **Icon** ⑰ and distance reading ④ will display on the screen.

  – Aim the Ranging Icon at your target and the distance will be displayed at the top of the screen. Press the **Ranging Button** again to accept the distance and the reticle will move to your new **calculated aiming point.** Use this new reticle position as your new point of aim for your target at distance.

● Long press the **Ranging Button** to turn off the Laser Range Finder. The reticle will return to your zeroed position.
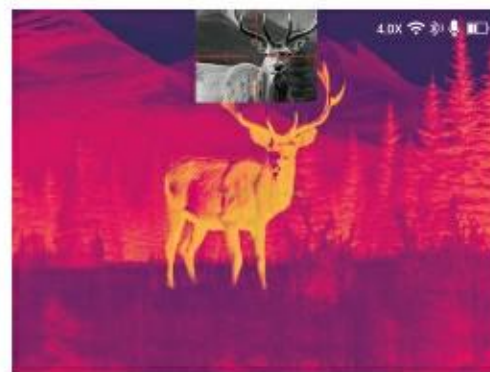
(First short press Ranging Button)

(Second short press Ranging Button)

(Third short press Ranging Button)

(Long press Ranging Button for 1.5 seconds)

Ballistic Calculation in Dual Mode

Ballistic Calculation in Dual Mode ensures that both thermal and digital points are the same as long as they are zeroed at the same target distance.

- Firstly, reticle zeroing both thermal and digital channels at preferred distance, as shown in Figure (1).
- Aim at your target, as shown in Figure (2).
- Perform Ballistic Calculation and the thermal and digital aim points are the same, as shown in figure (3).

Figure (1)

Figure (2)

Figure (3)

FCC Caution:

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

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

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