

# **Recon 3**

## **Multi Use Thermal Optic Monocular & Day Scope Clip-On**

**Model: TC500**

**User Manual**



**FUSION THERMAL**  
INFRARED ELECTRO OPTICS

**Fusion Thermal, LLC**  
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## 1. Description

The Fusion Thermal Recon 3 is a multi use thermal optic that is supplied with two different kinds of eyepieces, one which allows the unit to be used as a hand-held monocular, and a second which allows the unit to be used as an attachment in front of a traditional day scope, a role commonly referred to as a Clip-On. Thermal imagers are different from traditional night vision devices as they may be used day or night and will work effectively so long as there is a temperature differential between a viewed subject and its surrounding environment. It does not need any external light source to function, is not influenced by strong light exposure, works well in adverse weather conditions such as rain, fog, and smoke and is of great help in locating people and animals hidden by reasonable amounts of obstacles such as foliage. The Recon 3 has a wide range application including day/night predator, nuisance animal hunting, wildlife detection and observation, wounded game tracking, personal and property security, water navigation, search and rescue operations, and terrain orientation.



Fig. 1-1 Recon 3 Thermal Imager

## 2. Components and Controls



Fig. 2.1 Function Introduction

### 2.1 Components

No.	Name	Function description
①	Lens Cap	Lens protection device.
②	Objective Lens	Premium Germanium lens for the ultimate in thermal performance.
③	Target Focus Ring	Adjustable focus ring to bring your viewed subject into sharp focus.
④	Battery Compartment Cover	Open and close to install two CR123 batteries. Twist and pull to open. Push until you hear a click to shut and lock.
⑤	Eyepiece Locking Ring (Monocular Mode Only)	Locking ring used to attach and/or remove handheld viewing eyepiece.
⑥	Eyepiece Focus Ring (Monocular Mode Only)	Adjustable focus ring to bring your internal display screen into sharp focus.
⑦	Eye Shade	Enhances viewing comfort and blocks external light.

⑧	Clip-On Eyepiece (Clip-On Mode Only)	Clip-on eyepiece used to place the unit in clip-on mode and ready the unit for use in front of your day scope.
⑨	Clamping Ring (Clip-On Mode Only)	Used to lock the adapter ring between the thermal unit and the day scope.
⑩	Locking Ring (Clip-On Mode Only)	Locks the clip-on eyepiece on the thermal device.
⑪	Type-C Interface	Used for data communication and external power supply
⑫	Power Button	Power on/Power off/Standby/Up/Left
⑬	Menu(M) Button	Entering menu/Parameter switch
⑭	Correction(C) Button	Shutter Correction & Background Correction /Down/Right

## 2.2 Controls

Operation in normal display mode			Operation in menu mode/calibration interface		
	Short Press	Long Press		Short Press	Long Press
<b>Power (12)</b> Button	Standby/ Wake-Up	Power on / Power off	<b>Power (12)</b> Button	Adjust parameter /Scroll up options	—
<b>M (13)</b> Button	Enter the shortcut menu	Enter the advanced menu	<b>M (13)</b> Button	Function switch/Parameter selection ★	Save and exit menu
<b>C (14)</b> Button	Shutter correction	Background correction	<b>C (14)</b> Button	Adjust parameter/Scroll down options	—
<b>M (13)</b> Button + <b>C (14)</b> Button	—	<b>Clip-On:</b> Enter Point-of- Impact Fine Tuning interface.	<b>Power (12)</b> Button	Up/Left shift	Up/Left quick shift
			<b>M (13)</b> Button	X/Y shift	Save and exit
			<b>C (14)</b> Button	Down/Right shift	Down/Right quick shift
		<b>Monocular:</b>	<b>Power (12)</b>	Increase the	Quickly

		Enter stadiametric rangefinder interface	Button	distance between measurement bars	increase
			<b>M (13)</b> Button	—	Exit
			<b>C (14)</b> Button	Reduce the distance measurement bars	Quickly reduce
★ Under the shortcut menu, short press to switch functions; Under the advanced menu, short press to switch the parameter options.					

### 3. Menu/Status Bar Icons

	Screen brightness adjustment, four levels 
	Image Color Mode: B (Black hot), W (White hot), R (Red hot), C (Pseudo Color)
	Monocular Digital Zoom: × 1 Optical, × 2 Digital, × 4 Digital
	Ultraclear mode
	Bluetooth option/ Bluetooth on
	Bluetooth connected
	Video out option
	Video out on
	Battery type selection
	Blind pixel correction option
	Factory reset
	Battery capacity indicator
	Type-C power supply
	Orientation shift

## 4.Specifications

Model	Recon 3
Detector Parameters	
Detector Type	VOx Uncooled
Resolution	384*288
Pixel Size	17um
NETD	≤50mk
Frame Rate	50Hz
Optics Parameters	
Objective Lens	42 mm
Field of View	8.9° ×6.7°
3-Step Magnification	Monocular: 3X Optical, 6X Digital, and 12X Digital
Diopter Adjustment	-5D~+5D
Detection Range (Target size: 5.6' x 3.9')	Detection : 2300 Yards (2 pixels) Recognition : 800 Yards (6 pixels)
Display	
Type	OLED
Resolution	1080×960
Electrical Parameters	
Battery	CR123× 2
Power Consumption	<1500mW
Max. Battery Life	> 4hr
External Interface	
USB Interface	Type-C
Video Output	PAL (RCA Port)
External Power	Type-C
Functions	
Digital Compass	√
Motion Sensor	√
Remote Control	Bluetooth
Stadiametric Rangefinder	(Monocular Mode Only)
Replaceable Parts	M18 Attachment Eyepiece

Physic Parameters	
IP Rating	IP67
Weight (without batteries)	<14.8 oz.
Dimension	6.0“ x 2.4“x2.3“
Adapter Ring	M52×0.75

## 5. System Features

- Quick conversion between clip-on mode and monocular mode;
- Quick mounting and removal of clip-on to day scope;
- Detection range up to 2300 yards, recognition up to 800 yards;
- 1080×960 high resolution OLED display;
- Bluetooth remote control;
- Four image modes – white hot, black hot, red hot, pseudo color;
- Three Magnificaiton Levels (Monocular Mode): 3X Optical, 6X Digital, 12X Digital;
- Type-C interface power supply and data transmission;
- Build-in Bluetooth, compass, motion sensor;
- IP67 protection level;
- Compact size;
- Light weight and high impact resistance;

## 6. Operation System

### 6.1 Power on / Power off

In shutdown mode, long press Power (12) button for 3s to start up Recon 3 and the startup image appears on the display screen at the same time. After 6s, the device is started.

Long press **Power (12)** button for about 5s to shut down the device. A countdown will appear in the viewer. Releasing prior to countdown completion stops shutdown.

### 6.2 Standby Mode

This unit features a standby (power saving) mode. Quick press the **Power (12)** button to enter and exit standby mode.

To preserve battery life unit will shutdown after 30 minutes without any action when in standby mode.

### 6.3 Status bar

There is a status bar located at the bottom of the viewer screen. It displays information on important settings and operations, including: Image Color Mode, Screen Brightness Level, Gun Profile, Bluetooth, Ultraclear Mode, Video Out, Battery Status. Note: Not all icons will appear at all times. Icons appear only if applicable and operational relevant.

### 6.4 Shortcut Menu

In the normal display mode, quick press **M (13)** button to access the shortcut menu. There are three functions to the Shortcut Menu: Screen Brightness Adjustment, Image Color Mode Selection, Electronic Zoom (Monocular Mode Only) . Use **Power (12)** button and the **C (14)** button to adjust the parameters of each function. Shortcut menu interface is as shown in fig. 6-1. Exit the Shortcut menu by cycling thru the menu options.

- **Screen Brightness:** 1~4 lightness level;
- **Image mode:** W (White hot), B (Black hot), R (Red hot), C (pseudo color);
- **E-zoom (monocular mode only):** × 1=3X Optical, × 2=6X Digital, × 4=12X Digital.



Fig. 6-1 Shortcut Menu

## 6.5 Advanced Menu

Long press the **M (13)** button for 3s to enter the advanced menu interface (fig. 6-2). From top to bottom the function options are Ultraclear mode, Bluetooth, Video Out, Battery Type, Gun Profile, Blind Pixel Correction, and Factory Reset, referring to table 6-1 for details.

### Operations:

- Under the advanced menu, short press **M (13)** button to adjust the parameters of present option or enter the secondary menu.
- **Power (12)** button is used to shift -up| or -left|, **C (14)** button is used to shift -down| or -right|;
- Long pressing **M (13)** button for 3s to exit advanced menu interface.



Fig. 6-2 Advanced menu interface

Table 6-1 Recon 3 advanced menu function description

Icon	Name	Function	Description	Status
	Ultraclear Mode	ON/OFF	Boost thermal sensitivity to the max when using in poor visibility conditions: cloudy, rainy, foggy, etc. <u>Not needed or recommended for normal use.</u>	Displays on the status bar.

	Bluetooth	ON/OFF	Used to link with Bluetooth remote control, included.	Displays on the status bar.
	Video Output	ON/OFF	Transfer the analog video in pal through the Type-C data cable.	Displays on the status bar
	Battery Type	3V/3.7V	3.7v is selected for rechargeable batteries, and 3V is for normal dry batteries.	—
	Blind pixel correction	Calibrate the blind pixels on the image	Refer to 6.6	Blind pixel calibration interface (fig. 6-3)
	Factory reset	Restore factory state	Y: Confirm, N: Cancel Then long press M button to save and exit.	—

## 6.6 Blind Pixel Repair Feature

Unfortunately as thermal owners one of the things we've got to expect is an issue know as blind pixilation. You will know your experiencing it when a white or black dot suddenly shows up on your screen and won't go away even after you NUC the unit. These annoying little dots are normal and are to be expected at some point. Fortunately they are also easy to fix with our built in repair feature.

- Under the advanced menu, select the blind element calibration option and press **M (5)** button to enter the blind pixel correction interface (fig.6-3). A cross cursor will appear in the center of the screen.
- Move the cursor up-down or left-right to select the blind pixel through the **Power (4)** button and **C (6)** button. And press **M (5)** button to switch the orientation of X-axis (left-right) and Y-axis (up-down);
- After selecting the blind pixel, press **Power (4)** and **C (6)** button at the same time to correct the blind pixel;
- Repeat the above operations to fix any additional blind pixels, and the number of corrected blind pixels are shown on the status bar at the bottom of the screen;
- After the correction is completed, long press **M (5)** button to exit the blind pixel repair feature.



Fig. 6-3 Blind Pixel Correction Interface

## 6.7 Compass Calibration

- Long press **M (13)** button to enter advanced menu;
- Under the advanced menu, rotate the unit  $360^\circ$  3 times around the optical axis to enter the compass calibration interface, rotate in the direction as shown in fig. 6-4.



Fig. 6-4 Rotate Direction

- If done correctly a three-axis coordinate system (shown as fig. 6-5) will appear in the center of the screen. Set the unit down on a solid flat surface and point it to magnetic north. Leave the unit alone and allow the ten plane calibration process to operate. The unit will automatically complete the compass calibration process and exit after 30s.

- During the calibration process, short press **Power (12)** button to exit the compass calibration interface at any time.



Fig. 6-5 Compass Calibration Interface

### 6.8 Point-of-Impact Fine Tuning (Clip-On Mode Only)

The viewing screen of your thermal unit was perfectly centered at the factory during production. It is likely that you will experience little to no point-of-impact shift when used in front of your day scope. However, given the limitless scenarios of use it is impossible for any thermal unit to claim that no point-of-impact shift will ever occur. If while using as a clip-on you experience a change in your point-of-impact significant enough to warrant a correction the Recon 3 allows you to reposition the thermal viewing screen so as to align it with your day scope crosshairs. A built-in software feature makes the process easy and the unit will allow you to memorize up to four different screen repositions, represented by G1 (Gun 1), G2, G3 and G4.

#### Operation:

- In normal display mode, press the **M (13)** button and **C (14)** button for 3s at the same time to enter the screen reposition calibration interface.
- Press the **M (13)** button to switch between the orientation of X-axis (left-right) and Y-axis (up-down) as needed;
- Short press **Power (12)** button or **C (14)** button to change the position of

screen a little at a time, a long press will move it faster.

- After completing your screen repositioning, long press **M (13)** button to save and exit.

If you want to memorize your screen repositioning first select one of the four Gun Profiles: G1, G2, G3, G4. before beginning and saving your repositioning work. When you want to use a particular gun/scope combination that required a screen reposition simply make sure the proper Gun Profile is selected before use.

## 6.9 Stadiametric Rangefinder (Monocular Mode Only)

Stadiametric rangefinder is only for monocular mode which allows the user to estimate approximate distance to an object of known size.



Fig. 6-7 Stadiametric Rangefinder Interface

- In normal display mode, press the **M (13)** button and **C (14)** button for 3s at the same time to enter the stadiametric rangefinder interface (fig. 6-7).
- You will see on the display: two measurement bars, icons of three reference objects and respective distances for the three objects.
- There are three pre-set reference objects:
  - **Hare** - height 8"
  - **Hog** - height 2.6'

- **Deer** - height 5.5‘
  - Aim at the target, and then adjust the distance between the measurement bars by pressing **Power (12)** button or **C (14)** button until the target matches entirely between the two bars. **Power (12)** button is used to increase the distance and **C (14)** button to reduce the distance.
  - The distance to the object is automatically recalculated while moving the measurement bars and displayed on the left of the three reference objects.
  - Exit rangefinder mode with a long press of the **M (13)** button.

## 6.10 Bluetooth remote control connecting

6.10.1 Turn on the Bluetooth of the device and the icon will show at the bottom of the screen (refer item 6.5 for details)

6.10.2 Press and hold the power button for 15 to 30s until the bluetooth icon on the screen

turn to . Release the power button after the connection is done. The remote control is ready to use.

6.10.3 After connecting to the device, if the signal is disconnected in between, the bluetooth remote control will continue to search for connection within 1 minute.

## 7. Preventative Maintenance

### 7.1 Battery Installation

- The battery power icon is displayed on the status bar () and there are four levels of power;
- When the icon is appeared on the status bar, please change the battery in time so as not to affect the use;
- It is necessary to power off before replacing the batteries;
- Turn the **battery compartment knob** counterclockwise until it stops and lift to remove it.
- Install two CR123 batteries according to polarity instructions on the label inside the battery compartment as shown in fig. 7-1.
- Replace the battery cover and press it until it clicks - make sure the cover is closed on both sides.

**Note:**

- **Please do not use batteries of different types or batteries with various charge levels.**
- After installation, please set the battery type in the advanced menu for the first starting up--choosing 3.7V for rechargeable battery and 3V for ordinary battery (according to the instructions of the section 6.5), otherwise the battery level indication will be inaccurate and may be interrupted during operation.



Fig. 7-1 Schematic diagram of battery installation

## 7.2 Product Cleaning and Maintenance

- Clean the Recon 3 external body with a soft dry cloth or cloth damp with clean water. Never submerge the device in any liquid or rinse off with running water.
- Clean optical glass surfaces with air duster, or cleaning cloths specifically designed for this purpose. Do not rub the lens with any device that might scratch the surface.

## 8. General Trouble Shooting

**Table 8.1** General trouble shooting

Trouble description	Probable reason	Trouble shooting
Blurred Images	Subject or viewing screen out of focus;	Adjust the Target Focus Ring or Eyepiece Focus Ring.
	No image correction for a long time.	Perform Shutter or Background Correction
Blurred vision	Eye relief doesn't match;	Adjust the Eye relief until the image becomes clear.
No analog video output	Analog video doesn't open;	Open analog video output.
	Data cable doesn't support data transmission.	Replace data cable.
Fail to start up	Wrong battery polarity installation or depleted batteries.	Check the battery installation direction, replace batteries.
	Insufficient external supply voltage.	Check the voltage of external power supply.
The attachment's eyepiece is stuck during installation.	Eye relief mounting limit block isn't placed parallel to the guide slot and the position is dislocation.	Loosen the eyepiece, push it back to square, and then rotate the mounting.

※ ★Please contact with our company relevant personnel as soon as possible if there are some abnormalities that cannot be ruled out. Private demolition is strictly prohibited.

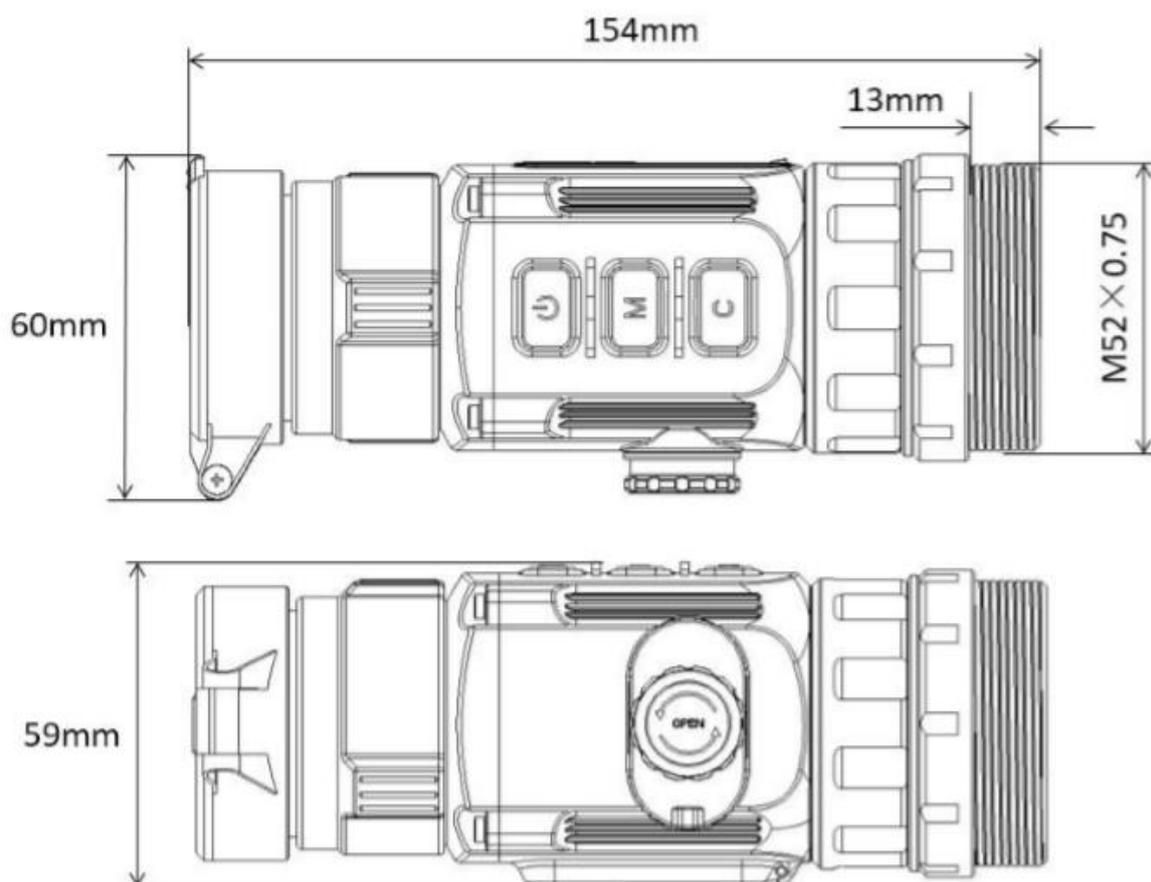
## 9. Appendix

### 9.1 User Interface Description

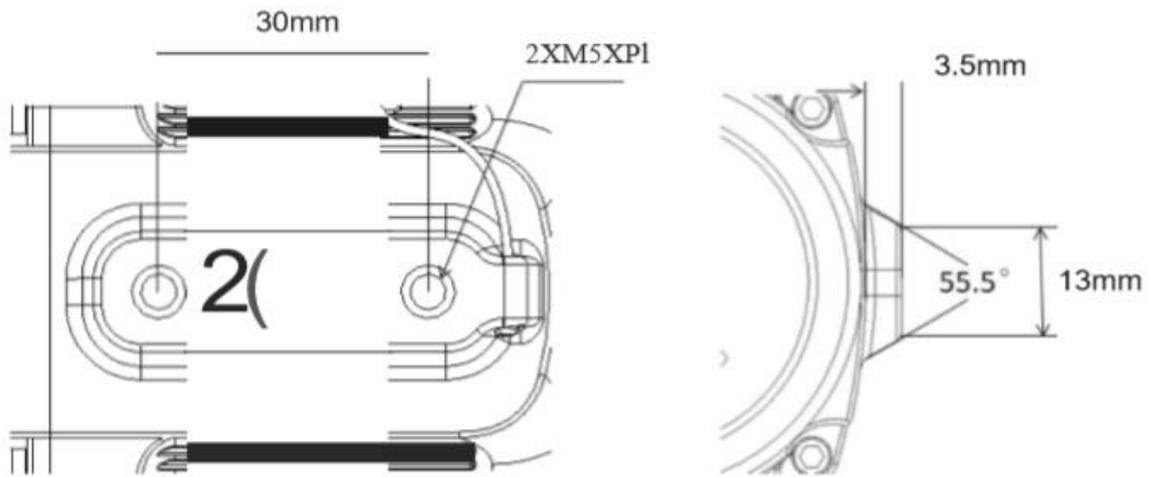
- Custom interface and data cable are adopted to support type-c power supply, serial port and PAL video;
- Support type-c and battery power supply, support over-voltage and under-voltage reverse connection protection.

### 9.2 Product Dimensions

#### 9.2.1 Boundary Dimension



### 9.2.2 Bottom Mounting Hole Size



**FUSION THERMAL, LLC PRODUCT REGISTRATION CARD**

**PRODUCT INFORMATION**

Product Name \_\_\_\_\_ Purchase From \_\_\_\_\_

Purchase Date \_\_\_\_\_ Product Serial # \_\_\_\_\_

**CUSTOMER INFORMATION**

Name \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ Country \_\_\_\_\_ Zip \_\_\_\_\_

Day Phone # \_\_\_\_\_ Home Phone # \_\_\_\_\_

E-mail address \_\_\_\_\_

.....  
Customer Signature Required

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