

BD500A1

OPTICAL WAVEGUIDE SIGHT / USER MANUAL



2026.10 | ERDI TECH LTD



1×

MAGNIFICATION

True 1× optical system



PARALLAX-FREE

IN-WINDOW PARALLAX

Unlimited eye relief



± 50 MOA

ADJUSTMENT RANGE

0.5 MOA per click



20 + 10

BRIGHTNESS LEVELS

Daylight and NV



≥ 1,500 h

CONTINUOUS RUNTIME

Single CR123A



IP67

WATERPROOF RATING

Zero forward emission

Both-eyes-open aiming through a parallax-free optical waveguide window with zero forward light emission.

Seven selectable reticles and 1,500 hours of operation at 22 °C from a single CR123A battery.

Full technical specifications are given in Section 4.

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About this manual. This manual describes the operation and maintenance of the BD500A1 optical waveguide sight. Read it completely before installing, zeroing or operating the sight, and keep it for future reference.
Figures are for reference only. Specifications apply to the standard BD500A1 and are subject to change without notice; the values in Section 4 were correct at the time of publication.

SAFETY INFORMATION

WARNING. Before installing, adjusting or servicing the sight, make sure the firearm is unloaded, the chamber is empty and the muzzle is pointed in a safe direction. Always wear eye protection when shooting.

CAUTION. The sight contains no user-serviceable parts. Do not disassemble, modify or repair it; unauthorized work voids the warranty.

NOTICE. Use only the supplied charger with the supplied rechargeable CR123A batteries. Never put a primary (non-rechargeable) CR123A battery in the charger.

Throughout this manual, **WARNING** indicates a hazard that can cause injury, **CAUTION** indicates a hazard that can damage the sight, and **NOTICE** gives information that helps you get the best result.

Revision history

Revision	Date	Description
v5	2026-10-18	Model designation corrected to BD500A1; specifications verified; optical principle, zeroing, inspection, care and troubleshooting sections added.
v4	2026-10-01	Previous edition.

1. Overview

The BD500A1 is a compact, parallax-free optical waveguide sight designed for rapid target acquisition with both eyes open. A laser diode and a collimating lens feed an internal waveguide lens that routes the reticle image to the shooter's eye. Because the reticle is never projected onto the outward-facing glass, no reticle light escapes toward the target: the sight has zero forward emission.

The sight provides seven selectable reticles, 20 daylight and 10 night-vision brightness levels with automatic brightness in daylight mode, motion-activated wake, and a runtime of 1,500 hours or more at 22 °C from a single CR123A battery. The AL7075-T6 aluminum housing is rated IP67 and 1,200 G, and the quick-detach mount gives a lower 1/3 iron-sight co-witness on MIL-STD-1913 Picatinny and STANAG 2324 rails.

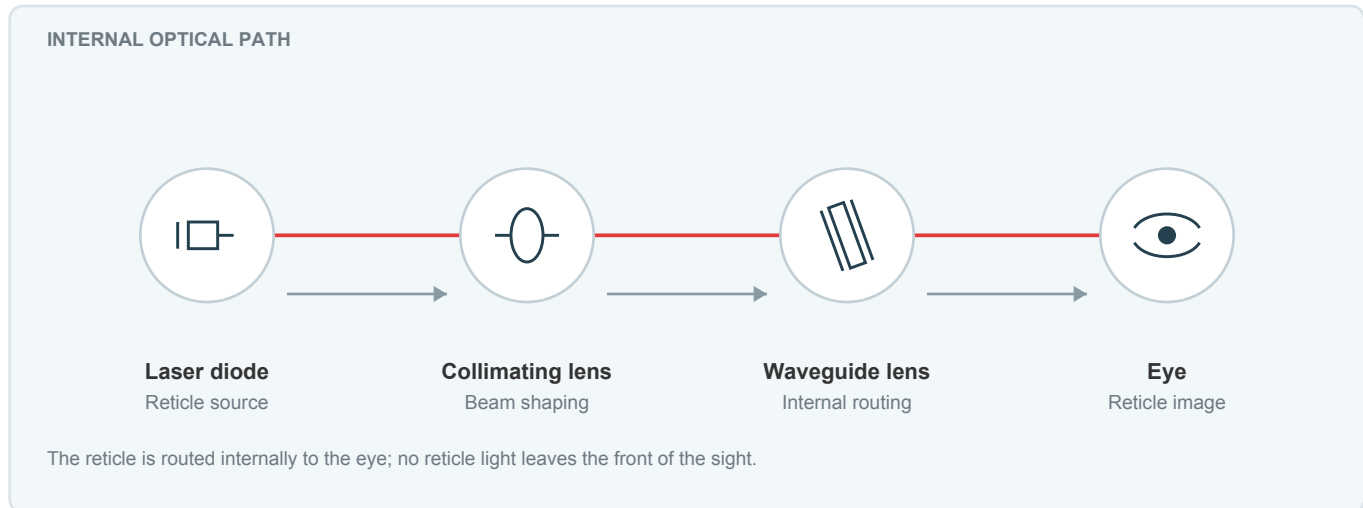
The BD500A1 is intended for close- to medium-range aiming on rifles, carbines, shotguns and other 1913-rail platforms. It is compatible with night-vision devices, thermal optics and magnifiers. It is an aiming aid only: it does not replace safe firearm handling and it does not magnify the target.



Figure 1 — BD500A1 optical waveguide sight

2. Optical Principle

A conventional red-dot sight projects an LED reticle onto a semi-reflective lens, so part of the light always leaves the front of the sight. A holographic sight reconstructs a laser hologram in front of the window. The BD500A1 uses a third approach: the reticle is generated inside the housing and routed to the eye through an optical waveguide.



The optical path runs from the laser diode through the collimating lens to the waveguide lens, which directs the reticle image to the eye. The waveguide keeps the reticle aligned with the eye across the whole window and produces a flat, high-contrast image. No light is projected forward from the objective, so the sight has no forward light signature.

- **Parallax-free.** The reticle stays on the point of aim as the eye moves within the window, and eye relief is unlimited.
- **Zero forward emission (“stealth view”).** There is no visible reticle glow in front of the sight, so the shooter's position is not given away.
- **High color fidelity.** The window does not tint the scene, so targets keep their natural colors.
- **Astigmatism-friendly.** The reticle stays clean and well defined where a projected red dot can appear as a starburst.

3. Product Features

- Advanced optical waveguide system with a zero forward light signature.
- Parallax-free with unlimited eye relief and comfortable both-eyes-open aiming.
- Seven selectable reticles, stored in the sight and retained after power-off.
- 20 daylight brightness levels with Auto brightness, plus 10 night-vision levels.
- Motion sensor wakes the reticle from standby in an instant.
- 1,500 hours or more of runtime at 22 °C from a single CR123A battery.
- Quick-detach lower 1/3 co-witness mount for MIL-STD-1913 and STANAG 2324 rails.
- AL7075-T6 aluminum housing, IP67 waterproof and rated for 1,200 G recoil.
- High color fidelity, astigmatism-friendly reticle, compact and lightweight (280 g).
- Compatible with night-vision devices, thermal optics and magnifiers.

4. Technical Specifications

Item	Parameter
Optical	
Magnification	1×
Window size	32 × 26 mm (1.26 × 1.0 in)
Parallax	Parallax-free
Eye relief	Unlimited
Reticle	Red; 7 selectable types
Forward emission	Zero
Power and electronics	
Battery	1 × CR123A (3.7 V, rechargeable)
Runtime	≥ 1,500 h at 22 °C*
Daylight brightness	20 levels (manual) + Auto
Night-vision brightness	10 levels (manual)
Motion wake	Yes — motion sensor, 10-minute standby
Low-battery alert	Reticle flashes every 2 s below 1 %
Auto power-off	After 8 h in standby
Mechanical	
Housing material	AL7075-T6 aluminum
Click value	0.5 MOA
Windage travel	± 50 MOA
Elevation travel	± 50 MOA
Mount	Quick-detach; lower 1/3 co-witness (1.65 in)
Rail standard	MIL-STD-1913 Picatinny / STANAG 2324
Physical	
Dimensions	85 × 50 × 65 mm (3.3 × 2.0 × 2.6 in)
Weight	280 g (9.9 oz)
Environmental	
Operating temperature	−30 °C to +60 °C (−22 °F to +140 °F)
Waterproof rating	IP67
Recoil rating	1,200 G
Recoil tested with	.338 Win Mag, .300 WM, 12 gauge

* Actual runtime depends on the brightness setting and ambient temperature. Specifications are subject to change without notice.

5. Package Contents

BD500A1 optical waveguide sight	× 1	Lens cloth	× 1
Rechargeable CR123A battery (3.7 V)	× 2	Brand sticker	× 1
Battery charger (two-channel)	× 1	Zeroing tool	× 1
User manual	× 1	Warranty card	× 1

The two supplied CR123A batteries are rechargeable and must be charged only with the supplied charger. Inspect the package on receipt and report any missing or damaged item to sales@erdicn.com.

6. Components and Controls

The main components are labeled in Figures 2 and 3. The sight is operated with the UP (+), DOWN (–) and NV buttons on the left side; their functions are summarized in the table below.

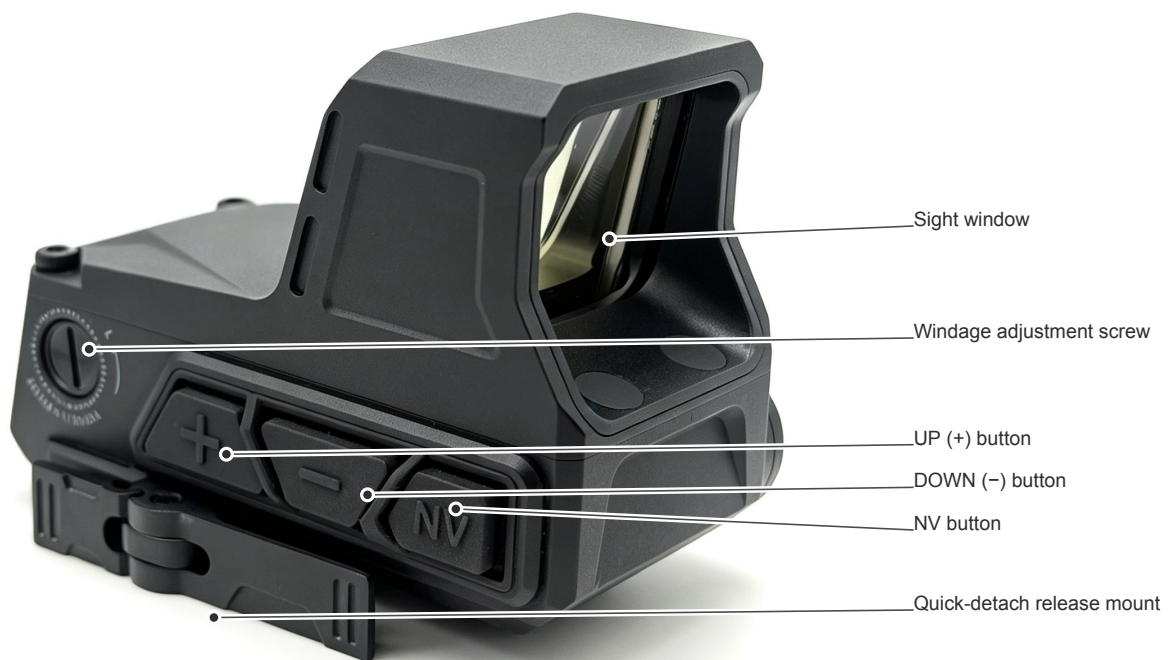


Figure 2 — Left side: sight window, buttons, quick-detach mount and windage adjustment screw

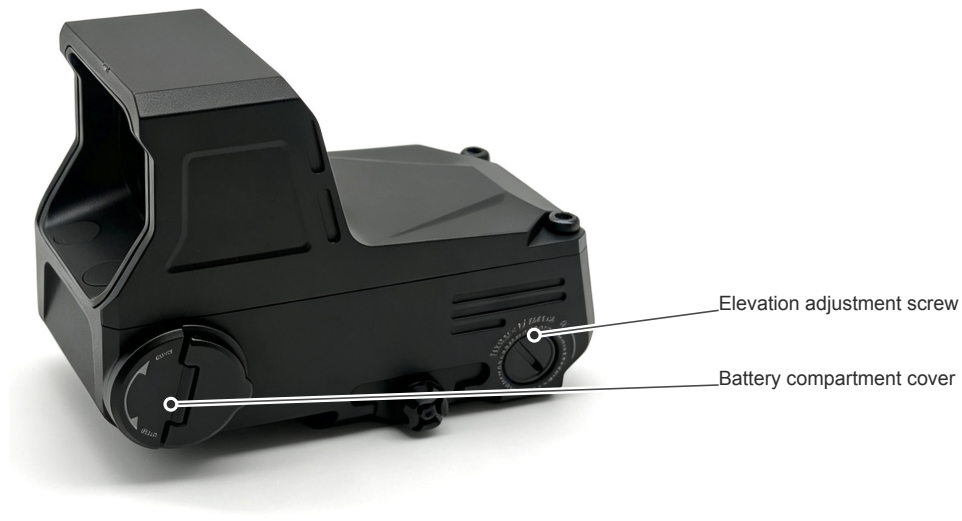


Figure 3 — Right side: battery-compartment cover and elevation adjustment screw

Component	Function
Sight window	Waveguide window; keep the glass clean and free of damage.
UP (+) button	Brightness up (short press); change reticle type (long press); power on.
DOWN (–) button	Brightness down (short press); power on.
NV button	Enter/exit NV mode (short press); Daylight Auto mode (long press); power on.
Quick-detach release mount	Locks the sight on a 1913 / STANAG 2324 rail.
Battery compartment cover	Waterproof cover; rotate to open and lock.
Windage adjustment screw	Moves the point of impact left or right (0.5 MOA per click).
Elevation adjustment screw	Moves the point of impact up or down (0.5 MOA per click).

The model name is marked on the sight body and the serial number on the bottom of the sight. Check that both markings are complete and legible, and that they match the warranty card, before use.

7. Buttons and Functions

The sight is operated with three buttons. The table below gives the function of each button for the two sight states.

Button	Sight status	Short press	Long press
UP (+)	On	Increase reticle brightness by one level	Change reticle type
UP (+)	Off	Power on the sight	—
DOWN (–)	On	Decrease reticle brightness by one level	—
DOWN (–)	Off	Power on the sight	—
NV	On	Enter / exit NV mode	Enter / exit Daylight Auto mode (3 flashes when entering, no flash when exiting)
NV	Off	Power on the sight	—

Button combinations:

Combination	Sight status	Function
UP + DOWN	On	Power off the sight
UP + NV	On	Motion wake: ON (reticle flashes 5×) / OFF (reticle flashes 3×)

The sight retains the last reticle type and brightness setting after power-off or standby.

7.1 Power On

Short press the UP, DOWN or NV button to power on the sight.

7.2 Power Off

Short press the UP and DOWN buttons simultaneously to power off the sight.

7.3 Standby and Motion Wake

When the sight is powered on and left stationary for 10 minutes it enters standby mode. If it remains stationary in standby for 8 hours it powers off automatically. The motion wake function is enabled by default: with the sight on, press the UP and NV buttons simultaneously to disable it (reticle flashes 3 times) or enable it (reticle flashes 5 times). When motion wake is enabled, any movement wakes the reticle immediately.

7.4 Brightness Modes

- **Daylight mode:** 20 levels. Short press UP or DOWN to raise or lower the brightness by one level. Auto brightness is available in this mode.
- **NV mode:** 10 levels. Short press NV to enter or exit NV mode. In NV mode the reticle brightness is automatically reduced to a night-vision-compatible level and the reticle is intended to be viewed through night-vision goggles.
- **Auto mode (daylight):** long press NV to enter (reticle flashes 3 times); the sight then sets the brightness to suit the ambient light. Long press NV again to exit (no flash). A short press of UP or DOWN in Auto mode adjusts the brightness manually and exits Auto mode.

7.5 Low-Battery Alert

When the battery level falls below 1 %, the reticle flashes every 2 seconds. Replace or recharge the battery as soon as possible.

8. Battery

The BD500A1 is powered by one CR123A (3.7 V, rechargeable) battery and provides a runtime of 1,500 hours or more at 22 °C. Before first use, insert a new or fully charged battery.

8.1 Installing the Battery

1. Lift the battery-cover handle and rotate it counterclockwise until the battery cover is removed.
2. Insert one CR123A battery into the battery compartment, observing the polarity marking (positive end inward).
3. Refit the battery-compartment cover in the correct orientation.
4. Rotate the cover handle clockwise to lock the cover, and check that it is fully seated.



Figure 4 — Battery-compartment cover

8.2 Charging the Batteries

The sight is supplied with two rechargeable CR123A (3.7 V) batteries and a two-channel charger.

- Insert the battery into the charger according to the polarity markings. Each channel is monitored independently, so one or two batteries can be charged at the same time.
- Connect the USB-C cable to the charger, and the standard USB end to one of the following: a 5 V / 2 A phone charger, a USB 3.0 port on a laptop or computer, or an external 5 V / 2 A power supply such as a USB power bank.
- Charging indicator: red while charging, green when fully charged, and flashing red for an error.
- Disconnect the charger as soon as charging is complete; do not overcharge.

8.3 Battery Precautions

WARNING

Use only the supplied charger to charge the supplied CR123A batteries. Using another charger may cause irreversible damage to the battery or to the sight and will void the warranty.

- Use only CR123A (3.7 V, rechargeable) batteries to power the sight.
- Do not use a battery charger that has been modified or damaged.
- If the sight will not be used for a long period, remove the battery and store it in a dry place.
- The battery compartment has reverse-polarity protection; always observe the polarity markings.
- Do not expose the battery to high temperatures or flames, and do not immerse it in water.
- Do not leave batteries unattended while charging.
- Remove the battery from the charger promptly after charging; total charging time must not exceed 24 hours.
- Keep batteries out of the reach of children and pets.
- Do not disassemble, modify, strike or drop batteries.
- Do not connect the battery to any device that draws more current than the permitted level.

8.4 Battery Care

- Avoid storing fully charged or fully discharged batteries for long periods; partially charge the battery before extended storage.
- Do not charge a very cold battery. Let it warm to room temperature for about 45 minutes before charging.
- Charge the battery at 0 °C to 45 °C (32 °F to 113 °F); charging outside this range may shorten service life.
- Recommended battery operating temperature: -30 °C to +60 °C (-22 °F to +140 °F).
- Battery capacity drops at sub-zero temperatures. This is normal and does not indicate a defect.

9. Installation and Adjustment

The BD500A1 mounts on a MIL-STD-1913 Picatinny or STANAG 2324 rail and provides a lower 1/3 iron-sight co-witness (1.65 in). For accurate aiming, install it at a comfortable position on the rail and zero it as described in this section.

9.1 Mounting

1. Open the quick-detach lever by rotating it outward 90°.
2. Place the sight on the rail at the required position so that the mount is seated flush against the rail.
3. Close the lever, then try to move the sight to confirm that it is locked.
4. If the sight is not flush or the lever cannot be closed, open the lever and adjust the nut on the opposite side by hand. Recheck the lock-up and repeat until the required tension is reached.

9.2 Co-witness and Eye Position

The mount places the optical axis at lower 1/3 co-witness height (1.65 in), so standard iron sights remain visible in the lower part of the window. Because the sight is parallax-free, eye relief is unlimited: place the sight at the distance that gives the most comfortable both-eyes-open view.

9.3 Zeroing

Always confirm the zero on your firearm before use. The following procedure uses a 25 yd target as an example.

1. Make sure the firearm is unloaded and the chamber is empty, and point the muzzle in a safe direction.
2. Set up a target at the desired distance (for example 25 yd).
3. Mount the sight as described in 9.1, power it on and select the reticle and brightness.
4. Aim at the center of the target, fire at least 3 shots, and note where the group lands (point of impact, POI).
5. If the POI does not match the reticle, keep the same aiming point and adjust the windage and elevation screws as described below.
6. Fire another 3-shot group and check the POI again. Repeat until the POI matches the reticle.

Adjustment	Turn	Point of impact moves
Elevation	Counterclockwise	Up
Elevation	Clockwise	Down
Windage	Counterclockwise	Left
Windage	Clockwise	Right

CAUTION

Each click is 0.5 MOA. The maximum adjustment range is ±50 MOA from the center. Use the supplied zeroing tool. If an adjustment screw stops turning, the limit has been reached: do not force it, as this may damage the sight.



Figure 5 — Adjustment direction and click value

10. Reticle Settings

The sight offers seven reticle types. Press and hold the UP button to cycle through reticles 1 to 7. The selected reticle is stored in the sight and retained after power-off.

			
2.5 MOA dot	65 MOA circle	Crosshair	2.5 MOA dot + 65 MOA circle
			
2.5 MOA dot + crosshair	65 MOA circle + crosshair	2.5 MOA dot + 65 MOA circle + crosshair	

Figure 6 — The seven reticle types

Reticle	Typical use
2.5 MOA dot	Precision at distance with minimum coverage of the target.
65 MOA circle	Fast close-range acquisition and moving targets.
Crosshair	Precise hold with clear vertical and horizontal reference.
2.5 MOA dot + 65 MOA circle	All-round use: fast ring with a precise center dot.
2.5 MOA dot + crosshair	Precise aim with an unobstructed center.
65 MOA circle + crosshair	Close-range speed with a fine aiming cross.
2.5 MOA dot + 65 MOA circle + crosshair	Maximum versatility across distances.

For reference, 1 MOA subtends approximately 1 inch at 100 yards (2.9 cm at 100 m).

11. Technical Inspection

Perform the following checks before each use.

Check	What to look for	If not correct
Appearance	No cracks or damage to the housing; all screws present	Stop using the sight and contact support
Window	Glass free of cracks, oil, stains and other contamination	Clean the window (Section 12); replace if cracked
Installation	Sight securely mounted; no signs of loosening	Re-tighten the quick-detach lever (9.1)
Battery	Battery charged; no foreign objects in the compartment	Charge or replace the battery; clean the compartment
Function	Sight powers on; buttons respond; reticle changes as expected	Charge or replace the battery; contact support if the fault persists
Image	Sight picture clear and free of interference	Clean the lens; contact support if the fault persists

12. Cleaning and General Care

Carry out maintenance at least twice a year.

- Wipe the external surfaces with a clean, soft, dry cotton cloth to remove dust and dirt.
- Clean the battery contacts and the battery compartment with a non-greasy organic solvent.
- Check the glass surfaces of the eyepiece and objective. Remove dust and sand with a non-contact method first, then use a specialist lens wipe and solvent for the optical surfaces.
- Do not use chemical solvents or thinners on the housing; use a clean, soft, dry cloth.
- Store the sight in a dry, well-ventilated place. Remove the battery if the sight will not be used for a long period.
- Do not expose the sight to temperatures below $-30\text{ }^{\circ}\text{C}$ or above $+60\text{ }^{\circ}\text{C}$ for extended periods.

Cleaning the optical surfaces

1. Blow off loose dust and sand with an air blower; do not wipe dry glass.
2. Wipe the glass with a clean lens cloth, in one direction, using light pressure.
3. For stubborn marks, use a specialist lens wipe with a small amount of optical solvent, then wipe dry with a clean lens cloth.

CAUTION

Do not disassemble or modify the sight. Unauthorized disassembly, modification or repair is prohibited and voids the warranty.

Maintenance schedule

Frequency	Task
Before each use	Complete the technical inspection in Section 11.
After each use	Wipe the external surfaces; clean the window if necessary.
Every 6 months	Clean the battery contacts and compartment; check the mount tension.
Extended storage	Remove the battery; store the sight in a dry, well-ventilated place.

13. Troubleshooting

The table below lists possible problems and their solutions. If a fault persists or cannot be corrected, contact sales@erdicn.com; do not attempt to repair the sight yourself.

Problem	Possible cause	Solution
The sight cannot be powered on	Battery discharged	Charge or replace the battery
	Battery installed incorrectly	Install the battery correctly (positive end inward)
The reticle is too dark or invisible	Sight is off or in standby	Power on the sight, or move it to wake it
	Reticle brightness too low	Increase the reticle brightness
	Sight is in NV mode	Exit NV mode
Reticle position shifts after shooting	Sight is loose	Check the mount and re-tighten the quick-detach lever
	Zero affected by environmental conditions	Re-zero the sight
The reticle is fuzzy	Reticle brightness too high	Lower the reticle brightness
	Eye focused on the sight housing	Focus on the target; the sight is parallax-free
	Astigmatism	Wear corrective lenses for nearsightedness or astigmatism
The image is fuzzy	Contamination on the objective lens	Clean the objective lens

14. Warranty and Support

ERDI TECH LTD warrants the BD500A1 against defects in materials and workmanship under normal use and maintenance for the period stated on the warranty card supplied with the product. Keep the product packaging and the warranty card for any claim.

The warranty does not cover normal wear and tear; damage caused by accident, misuse, improper storage or unauthorized disassembly, modification or repair; damage caused by using a non-approved charger or battery; or transport damage.

For product support, spare parts and warranty service, contact sales@erdicn.com and quote the model (BD500A1) and the serial number marked on the bottom of the sight.

Legal notice. The BD500A1 is a firearm accessory. It is the user's responsibility to comply with all applicable laws and regulations governing the purchase, possession, transport and use of firearm accessories in the user's country and state.

Battery disposal. Do not dispose of the battery with household waste. Follow local regulations for the recycling or disposal of lithium batteries.



BD500A1

OPTICAL WAVEGUIDE SIGHT

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