



ARKEN OPTICS



**ZULUS HD 5 - 20X LRF**

**DIGITAL DAY / NIGHT  
SCOPE**

# CONTENTS

**ZULUS HD 5-20X LRF** DIGITAL DAY/NIGHT SCOPE

# ZULUS HD 5-20X LRF

DIGITAL DAY/NIGHT SCOPE

## Safety Instructions

Read and follow all instructions

Read all warnings!

Do not attempt to disassemble the device by yourself, all services must be provided by the manufacturer

## CAUTION

- ⦿ INFRAR-ED (IR) illuminator may cause harm to human eyes, DO NOT look directly at it.
- ⦿ Switch off the IR illuminator when not in use. Continuous use of IR light will generate excessive heat. Avoid pointing it towards flammable objects.
- ⦿ Operating temperature is between -4F-122F ( -20~50°C).

## Description

ZHD520R, a 24/7 all-weather conditioned digital scope, with its excellent day and night time image quality, is specifically designed for outdoor hunting. Built-in high-precision laser rangefinder and leading ballistics algorithm make it easy to aim at the target quickly and accurately.

## Package Content

- ZHD520R Scope
- Rail Accessories (M6 / M4 screws, mount, spanner, lens cleaning cloth)
- Eyepiece Protector
- USB Cable
- User Manual

## ■ Specifications

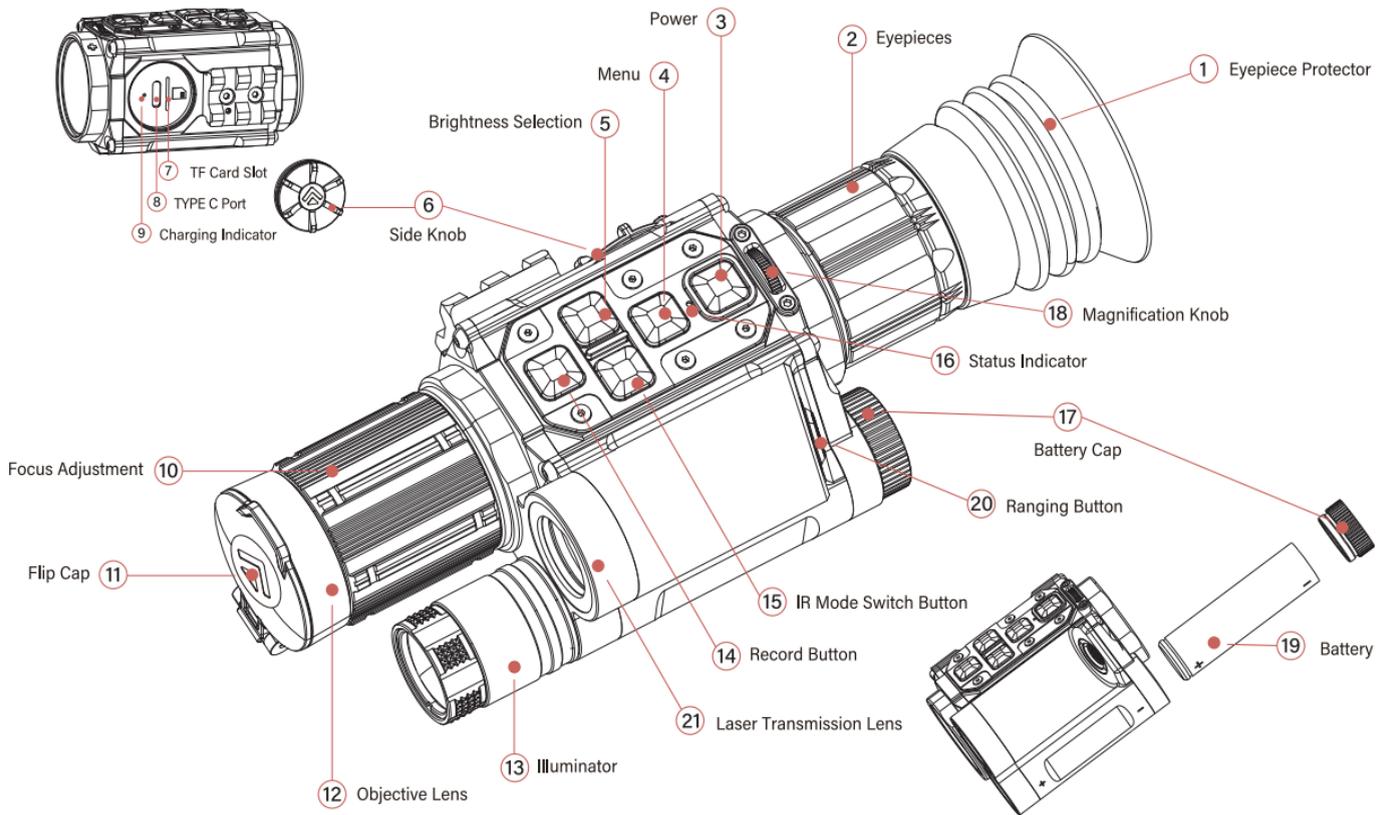
| Model ZULUS HD 5-20X LRF      |                          |
|-------------------------------|--------------------------|
| <b>Sensor Specifications</b>  |                          |
| Resolution                    | 1920 x 1080 pixels       |
| Frame Rate                    | 60Hz                     |
| Video Record Resolution       | 1920 x 1080 pixels       |
| <b>Optical Specifications</b> |                          |
| Digital Magnification         | 5 ~ 20x                  |
| Eye Relief                    | 45mm                     |
| Diopter Adjustment            | ± 5D                     |
| Detection Range               | 400M                     |
| <b>Display Specifications</b> |                          |
| Type                          | Micro - OLED             |
| Display Resolution            | 1920 x 1080 pixels       |
| Frame Rate                    | 60Hz                     |
| <b>Battery Power Supply</b>   |                          |
| Battery Type                  | 18650 Battery (flat-top) |
| Operating Time                | 8h                       |
| External Power Supply         | 5V - Type C USB          |

| Model ZULUS HD 5-20X LRF                                     |   |
|--|---|
| <b>Physical Specifications</b>                               |   |
| Net Weight   | 483g                                      |
| Gross Weight <sub>(w/battery,mount,eyepiece protector)</sub> | 584g                                      |
| Dimensions   | 201 *79 * 53mm                            |
| Micro TF Card  | 32 ~128 ( U1/C10 ) GB                     |
| Ingress Protection   | IP67                                      |
| WIFI / APP   | Support (Arken Optics) / Arken Ballistics |
| IR Wavelength  | 850/940nm                                 |
| Infrared Power   | 5W  |
| Working Temperature  | -20~50°C                                  |
| Bluetooth Function   | Support                                   |
| Max Range  | 1000M                                     |

## ■ Features

- High Resolution Imaging
- Video Recording In 1920 x 1080 60 Hz
- Micro-OLED HD Display, 60 Hz
- Instantaneous Zeroing
- 3-Axis Gyroscope
- Picture-in-Picture Function
- Full-Color Under Low Light Conditions
- Anti-Backlight Overexposure Compensation
- Wi-Fi to App Direct Connection
- Wireless Firmware Updating Via App
- One Touch Zeroing Via App
- Precise Ranging and Leading Ballistic Calculation
- Customized Ballistic Table

## Controls

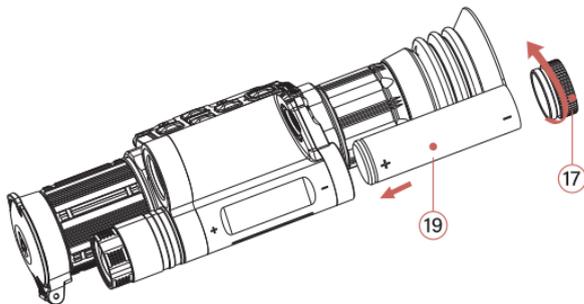


## ■ Power Supply

This device is powered by an external 18650 battery with up to 8 hours of operation time (when the IR mode switched off). When battery is low, it can either be charged independently or by connecting the device to TYPE C port. Please note that it is recommended to fully charge the 18650 battery before initial use.

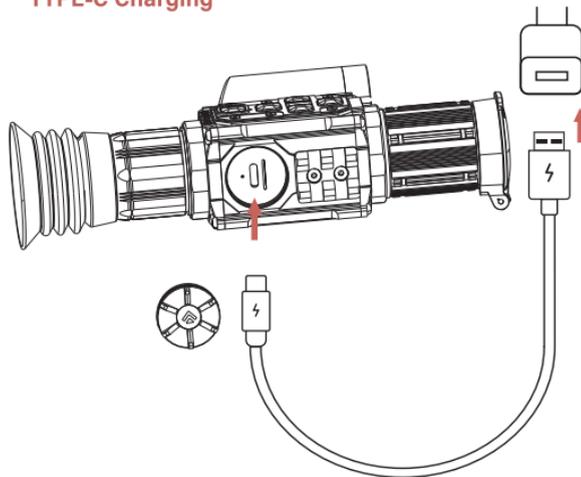
Note: Please purchase genuine 18650 battery from regular channels. Any problems arising from inferior 18650 battery purchased by the user shall be borne by the user himself.

### Installing the 18650 Battery (flat-top)



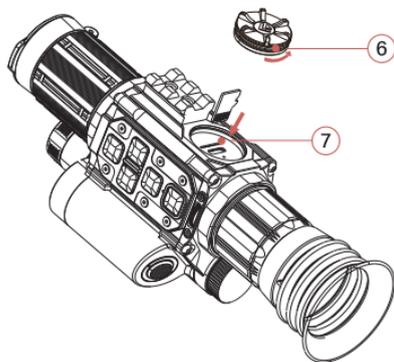
1. Open the Battery Cap (17) and pull it off.
2. Insert 18650 Battery (19) into slot in the orientation indicated "+".
3. Apply pressure to Battery Cap (17) against battery "-" and turn it until fully tightened.

### TYPE-C Charging



Note: To use TYPE-C cable for charging, a power adapter (5V2A) is needed.

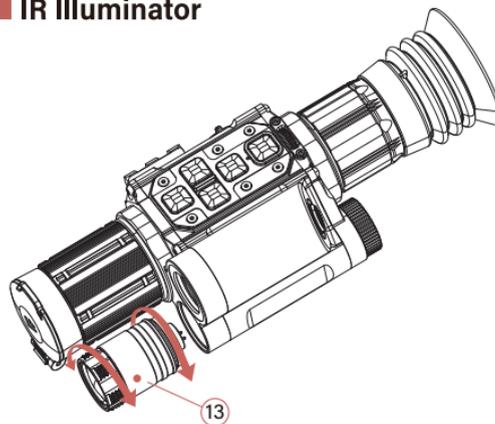
## TF Card Slot



Open the Side Knob (6) insert TF card into the slot (7)

Note: TF card insert to certain direction.

## IR Illuminator



Rotate the IR Illuminator (13) to adjust brightness. Optimal focus enables maximum detection range.

Note: IR Illuminator (13) is replaceable for 850nm or 940nm.

## Indicator

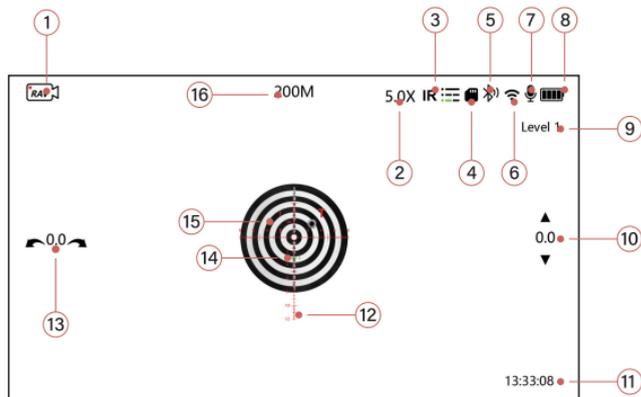
| Indicator    | Color | On       | Flash                           |
|--------------|-------|----------|---------------------------------|
| Charging (9) | ●     | Charging | --                              |
| Status (16)  | ●     | Working  | --                              |
|              | ●     | Standby  | Updating: Yellow light flashing |

## Control Description

| Button  | Status                   | Short Press             | Long Press        | Rotation |
|---|--------------------------|-------------------------|-------------------|----------|
| <b>Power Button ③</b><br>          | Off                      | --                      | On                | --       |
|   | View Interface           | Standby                 | Off               | --       |
|   | Standby                  | Wake-up                 | --                | --       |
|   | Zeroing Interface        | Freeze/Continue         | --                | --       |
| <b>Menu Button ④</b><br>           | View Interface           | Reticle Color Switch    | Menu Interface    | --       |
|   | Primary Menu Interface   | View Interface          | --                | --       |
|   | Secondary Menu Interface | Primary Menu Interface  | --                | --       |
| <b>IR Mode Switch Button ⑮</b><br> | View Interface           | --                      | Color Mode Switch | --       |
|   | Black/White Mode         | IR Brightness Adjust    | Color Mode        | --       |
|   | Menu Interface           | Move Cursor to the Left | --                | --       |
|   | Zeroing Interface        | Move Cursor to the Left | Save and Exit     | --       |
|   | Time Setting Interface   | Move Cursor to the Left | Save and Exit     | --       |

| Button   | Status                        | Short Press                           | Long Press                          | Rotation   |
|--|-------------------------------|---------------------------------------|-------------------------------------|--|
| <b>Brightness Button ⑤</b><br>  | View Interface                | Display Brightness Adjustment         | Wi-Fi On/Off                        | --   |
|  | Menu Interface                | Move Cursor to the Right              | --                                  | --   |
|  | Zeroing Interface             | Move Cursor to the Right              | Exit Current Setting                | --   |
|  | Time Setting Interface        | Move Cursor to the Right              | Exit Current Setting                | --   |
| <b>Record Button ⑭</b><br>      | View Interface                | Start Recording /Pause /Resume        | Start/End Recording                 | --   |
|  | Menu Interface                | Confirm the Selection                 | --                                  | --   |
|  | Reticle Zeroing Interface     | Reticle X/Y Value Adjust Once         | Reticle X/Y Value Continuous Adjust | --   |
| <b>Magnification Knob ⑱</b><br> | View Interface                | --                                    | --                                  | To Right Increase the Magnification / To Left Decrease the Magnification |
|  | Reticle Zeroing Interface     | --                                    | --                                  | To Right Increase the Magnification / To Left Decrease the Magnification |
| <b>Ranging Button ⑳</b><br>     | Fail to Connect App Bluetooth | Show/Hide Ranging Icons and Distances | Turn Off Ranging                    | --   |
|  | Connected to App Bluetooth    | Ranging and Ballistic Calculation     | Turn Off Ranging                    | --   |

## Interface Description



- 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 Current Magnification ( eg. 5.0x ).
- ③ The displayed icon indicates if the device is in black and white mode; otherwise it is in color mode.

|         |   |
|---------|---|
| IR:     | Black and white mode; Illuminator off                           |
| IR:     | Brightness Level 1  |
| IR:     | Brightness Level 2  |
| IR:     | Brightness Level 3  |
| IR:     | Brightness Level 4  |
| IR:     | Brightness Level 5  |
| IR AUTO | Black and white mode; Brightness will be adjusted automatically |

- ④ TF card ( Card icon appears when it's inserted. The recording won't work without the TF card).
- ⑤ Bluetooth ( Bluetooth on, Bluetooth off, Bluetooth Connected).
- ⑥ WiFi ( Wi-Fi On, Wi-Fi Off ).
- ⑦ Microphone, Indicates whether sounds to be included when recording.  
 Microphone On Microphone Off.
- ⑧ Battery Status

| Icon | Status   | Battery Status           |
|------|----------|--------------------------|
|      | 1 bar    | 10% ~ 20%                |
|      | 2 bars   | 20% ~ 50%                |
|      | 3 bars   | 50% ~ 80%                |
|      | 4 bars   | 80% ~ 100%               |
|      | Charging | Connect Type C to charge |

- ⑨ Level 1: Current Display Brightness (Level 1-6 with Increasing Brightness).
- ⑩ Gyroscope Vertical Drift.
- ⑪ Current Time.
- ⑫ Reticle.
- ⑬ Gyroscope Horizontal Drift.
- ⑭ Point of Impact.
- ⑮ Ranging Icon.
- ⑯ Ranging Distance.

## Menu List

Long press Menu ④ for 2 seconds to enter Menu list; There are 15 selections in total; Use IR Mode Switch Button ⑮ and Brightness Button ⑤ to navigate through menu options; Short press the Record Button ⑭ to confirm selection.

| Icon  | Description   |
|---|---|
|  | <b>[Recording]</b> Auto Video Recording after Shooting  |
|  | <b>[PiP]</b> PiP Window on View Interface   |
|  | <b>[Wi-Fi]</b> Wi-Fi On/Off   |
|  | <b>[Reticle Zeroing]</b> Reticle Zeroing  |
|  | <b>[Color Boost Mode]</b> Select Mode: Color Boost/<br>Natural Color  |
|  | <b>[Sound Record Control]</b> Control whether to include<br>sound in Recorded Video   |
|  | <b>[Loop Recording]</b> Set Video Duration : 1 Minute,<br>3 Minutes,5 Minutes or OFF (default 10 Minutes)                   |
|  | <b>[Gyro]</b> Gyroscope Calibration   |
|  | <b>[Auto Sleep]</b> In Auto Sleep Mode, The Device will<br>Automatically Power OFF after 10, 20 or 30 Minutes of Inactivity |

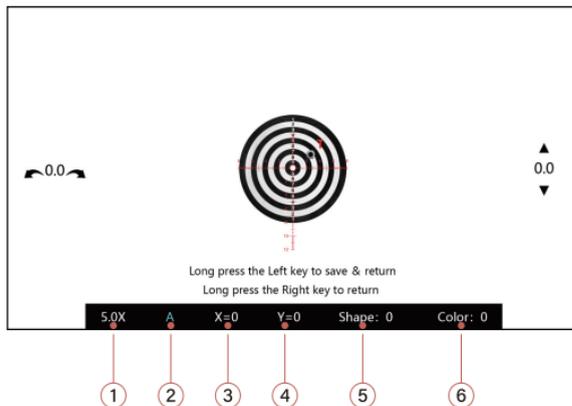
| Icon  | Description   |
|---|---|
|  | <b>[Ballistics Calculation]</b> Ballistics Calculation  |
|  | <b>[Ranging Unit]</b> Select the Unit of Distance   |
|  | <b>[Aiming Method]</b> Select "Dial-in" or "Holdover" to Target   |
|  | <b>[Bluetooth]</b> Turn On or Turn Off Bluetooth  |
|  | <b>[System Settings]</b> Whether Display the Time When<br>Recording; Current Version; Set the Current Time;<br>Date and Language; Format the TF Card and Restore the<br>Factory Default Settings.<br><br><small>(Note : Formatting the TF card will erase all files stored on the card)</small> |

## Main Function Description

### Reticle Zeroing

Long press the Menu Button (4) for 2 seconds to enter menu list.  Press the Brightness Button (5) to move cursor to Reticle Setting menu, then press Recording Button (14) to select Reticle Setting.

- Short press Brightness Button (5) to move cursor to the right; Short press the IR Mode Switch Button (15) to move cursor to the left;
- Short press Recording Button (14) to increase current value by 1; Long press (without release) to continuously increase the current value within the allowed range. Short press the Menu Button (4) to decrease current value by 1; Long press (without release) to continuously decrease the current value within the allowed range;
- Long press IR Mode Switch Button (15) for 2 seconds to save and exit Reticle Zeroing; Long press Brightness Button (5) to exit without saving;
- Short press Power Button (3) to freeze/reactivate current image.



- ① 5.0x: Current objective magnification; adjustable with Magnification Knob (18)
- ② A: Current ballistic profiles; up to 26 (A-Z) profiles for reticle settings
- ③ X=0: Current coordinate point of reticle in horizontal direction
- ④ Y=0: Current coordinate point of reticle in vertical direction
- ⑤ Shape: 4 reticle shapes
- ⑥ Color: 5 color options white(0), green(1), red(2), yellow(3), black(4)

## Reticle Zeroing

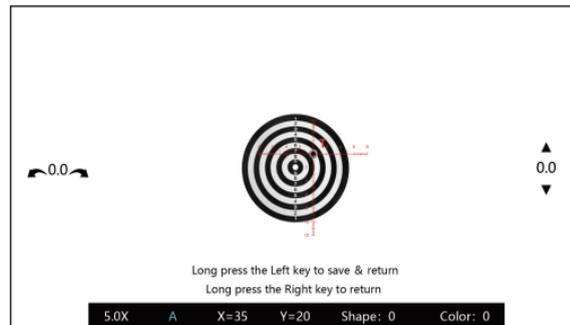
### Example

Place the target at 50 meters, turn Focusing Adjustment ⑩ to ensure the Objective Lens ⑫ provide a clear view of the target; Align the crosshairs with the target. The bullet hole will create an impact point (T). While keeping the current aiming point unchanged, short press the Power Button ③ to freeze current image. Move X and Y coordinates of the reticle to align cross hair center precisely with impact point (T).

Note: Once the reticle has been changed (either moved or changed Shape or color), the magnification cannot be adjusted.



(Before Zeroing)

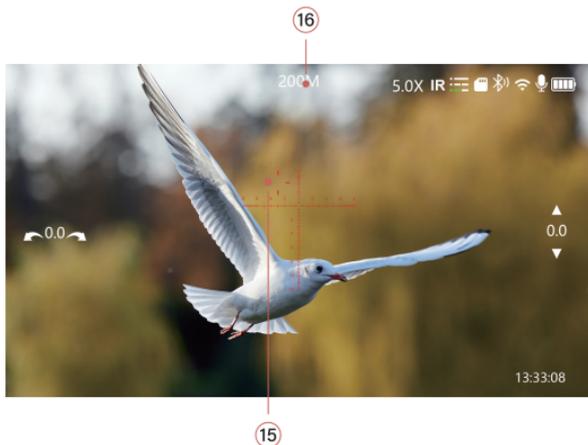


(After Zeroing)

## Distance Measurement Function

On the ballistic calculation menu, if you select "Off" or fail to connect the mobile phone App Bluetooth to the device Bluetooth, the device will only measure the distance:

- Short press the Ranging Button to turn on the distance measuring function. The Ranging Icon **15** and current targeting distance **16** will display on the screen (It will automatically and continuously measure the distance once the distance measurement function is turned on).
- Continue to short press or long press the Ranging Button for 1.5 seconds to turn off the distance measurement function. The Ranging Icon and current distance will not displayed on the screen.



(First short press Ranging Button)



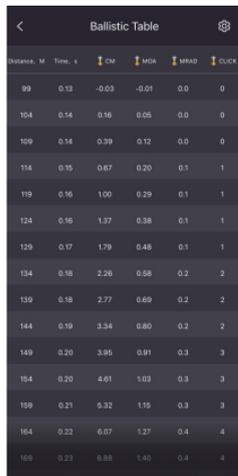
(Long press Ranging Button for 1.5 seconds)

## Ballistic Calculation - Real-time Calculation

- Enter the menu list, press the Ballistic Calculation, select the real-time ballistic calculation, and turn on the Bluetooth at the same time.
- Connect the device's Bluetooth via the Arken Ballistics App (the Bluetooth name of the device is ZHD520R and it can be viewed in the version interface)
- After determining the ranging target, short press the device ranging button to transmit the measured distance to the App, which performs the ballistic calculation and sends the result back to the device and displays on the screen.

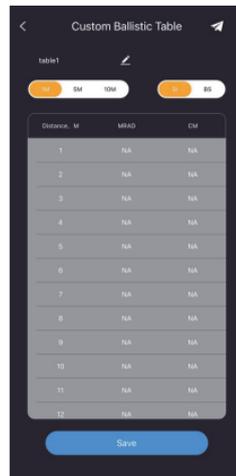
## Ballistic Calculation - Ballistic Table

- Enter the menu list, press the Ballistic Calculation and select "Ballistic Table Query", turn on the Bluetooth at the same time (when there is a ballistic table on the device, you don't need to turn on the Bluetooth any longer).
- Click the Send Icon  to update the App Ballistic Table to the device. The device will use the App transmitted data in the ballistic table to perform ballistic calculation and display the result on the screen.



| Distance, M | Time, s | CM    | MGA   | MRAD | CLICE |
|-------------|---------|-------|-------|------|-------|
| 99          | 0.13    | -0.03 | -0.01 | 0.0  | 0     |
| 104         | 0.14    | 0.16  | 0.05  | 0.0  | 0     |
| 109         | 0.14    | 0.39  | 0.12  | 0.0  | 0     |
| 114         | 0.15    | 0.67  | 0.20  | 0.1  | 1     |
| 119         | 0.16    | 1.00  | 0.29  | 0.1  | 1     |
| 124         | 0.16    | 1.37  | 0.38  | 0.1  | 1     |
| 129         | 0.17    | 1.79  | 0.48  | 0.1  | 1     |
| 134         | 0.18    | 2.26  | 0.58  | 0.2  | 2     |
| 139         | 0.18    | 2.77  | 0.69  | 0.2  | 2     |
| 144         | 0.19    | 3.34  | 0.80  | 0.2  | 2     |
| 149         | 0.20    | 3.95  | 0.91  | 0.3  | 3     |
| 154         | 0.20    | 4.61  | 1.03  | 0.3  | 3     |
| 159         | 0.21    | 5.32  | 1.16  | 0.3  | 3     |
| 164         | 0.22    | 6.07  | 1.27  | 0.4  | 4     |
| 169         | 0.23    | 6.86  | 1.40  | 0.4  | 4     |

(BC ballistic table interface)



| Distance, M | MRAD | CM |
|-------------|------|----|
| 1           | NA   | NA |
| 2           | NA   | NA |
| 3           | NA   | NA |
| 4           | NA   | NA |
| 5           | NA   | NA |
| 6           | NA   | NA |
| 7           | NA   | NA |
| 8           | NA   | NA |
| 9           | NA   | NA |
| 10          | NA   | NA |
| 11          | NA   | NA |
| 12          | NA   | NA |

(Customized ballistic table interface)

## Aiming Method - Holdover

Enter Menu Options, Aiming Point Method: Select "Holdover".

- First short press the Ranging Button to activate the ranging function, the Ranging Icon (15) and distance (16) will display on the screen and the aiming point won't.
- Second short press the Ranging Button: after determining the target, short press on the Ranging Button, the Ranging Icon (15) disappears, the distance (16) is displayed, and the moving aiming point (14) is displayed (ie. the point of impact by ballistic calculation).
- Third short press the Ranging Button: Ranging Icon (15) and distance (16) are displayed, the aiming point disappears.
- Long press the Ranging Button for 1.5 seconds to return to the status when ranging was not activated: the Ranging Icon (15) and distance (16) disappear.



(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 Menu Options, Aiming Method: Select "Dial in"

- First short press the Ranging Button to activate the ranging function; the Ranging Icon **15** and distance **16** will display on the screen.
- Second short press the Ranging Button: Ranging Icon **15** disappears, distance **16** is displayed, and the Reticle automatically moves to the ballistic impact point.
- Third short press the Ranging Button: the Ranging Icon **15** and distance **16** are displayed and Reticle returns to its original position.
- Long press the Ranging Button for 1,5 seconds to return to the status when the Ranging was not activated: the Ranging Icon **15** and distance **16** disappear.



(First short press Ranging Button)



(Second short press Ranging Button)



(Third short press Ranging Button)



(Long press Ranging Button for 1.5 seconds)

## Image Quality Enhancement Function

Multiple image qualities: natural images and color-enhanced images.



(Natural Mode: This is what human eye sees in real life)



(Color Boost Mode: Image with enhanced color)

## ■ App Instruction-Arken Optics

Please search and download the " Arken Optics " App from the App store.

For Android phones, please go to [Google Play Store](#).

For iOS phones, please go to [Apple Store](#).

Search for " Arken Optics " to download the App.

### App Connection and Use

**【Step 1】** After turning on the device, long press the Brightness Button (5) for 2 seconds to turn on Wi-Fi, the account (starting with ZHD520R) and password (12345678) can be seen on the display.

**【Step 2】** Go to Wi-Fi setting on the phone to connect the device.

**【Step 3】** Open "Arken Optics" App and Enjoy!(User instruction is included in the App).

## ■ App Instruction-Arken Ballistics

If trying to use the ballistics calculation function, you need to download the [Arken Ballistics APP](#).

For [Android](#) phones, please go to [Google Play Store](#).

For [iOS](#) phones, please go to [Apple Store](#).

Search for " [Arken Ballistics](#) " to download the App.

### App Connection and Use

**【Step 1】** Turn on Bluetooth on the phone, Bluetooth on the device and Ranging Button.

**【Step 2】** Click the Bluetooth Icon  in the App interface, it will jump to the Bluetooth connection interface when first connecting, and then enter the device name to connect.

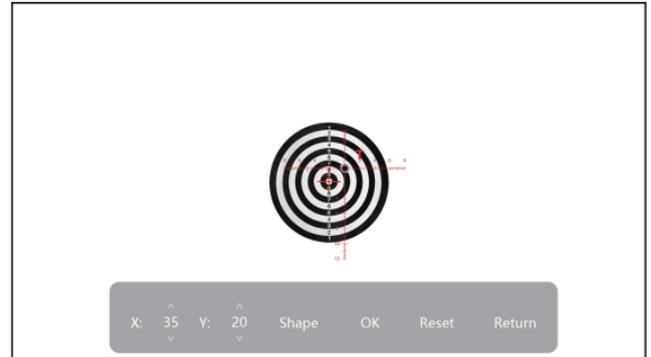
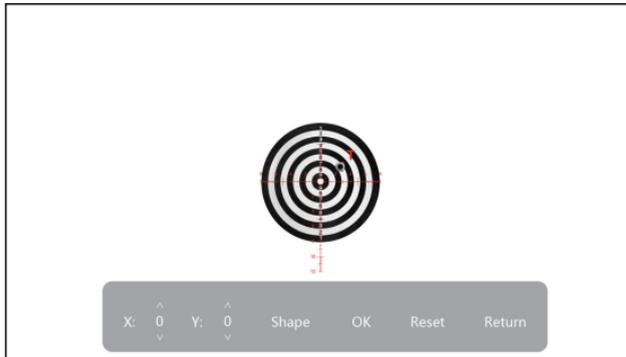
After successful connecting, the last Bluetooth device will be connected by default.

## Firmware Update

Using the "Firmware Update" feature on the App to perform online OTA/Wireless Updates.

## Reticle Zeroing on App

Tap the Icon  on App. When in landscape mode, short press Power Button  to freeze current image; Swiftly move your finger from the reticle center to point of impact on the phone; Precise adjustment of X and Y coordinates can be done by tapping the up and down arrow on the App. Once the reticle center and the point of impact is perfectly aligned, click "OK" to complete the current Zeroing.



## ■ FCC WARNING

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.



[WWW.ARKENOPTICSUSA.COM](http://WWW.ARKENOPTICSUSA.COM)

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