

EchoFlex™

Handheld Articulating Videoscope System

— USER MANUAL · V1.0



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BEFORE YOU BEGIN

Read this manual completely before using the system, and keep it on hand for future reference.

NOTICES IN THIS MANUAL



CAUTION

Marks an instruction you must follow to avoid damage to the system or a delay in service.



NOTE

Adds detail that helps you get a better result.

01

Introduction

The EchoFlex is a handheld articulating videoscope system for remote visual inspection in confined spaces. The system has its own touchscreen, control keys, battery, and storage, and it accepts interchangeable probes, so a single controller can be set up for many different inspection tasks.

About the system

A joystick steers the tip of the probe while live video is shown on the 5.5-inch touchscreen. Dedicated keys capture photos and video to the SD card, and the on-screen menu gives access to image tools, playback, and system settings.

This manual covers assembly, operation, the on-screen display, and care of the system. Read it completely before first use and keep it with the system for reference.

Zibra Corporation has supplied borescopes, fiberscopes, and videoscopes to industry since 1984. For help selecting probes for your application, or for service, use the contact details on the back cover.



Key features

Interchangeable probes

One controller accepts EchoFlex articulating videoscope probes from 1.8 mm to 8.4 mm in diameter, in a range of lengths.

Joystick articulation

The joystick steers the probe tip in two or four directions, depending on the probe model. A damping mode supports precise one-handed control.

Tip-mounted imaging and light

Each probe carries a CMOS image sensor and LED illumination at the distal tip. White light and UV models are available.

Dual view

Dual-view probes, available from 2.8 mm in diameter, show more than one camera view on the screen at the same time.

HD touchscreen and keys

A 5.5-inch 1920 × 1080 touchscreen works alongside physical keys for recording, playback, zoom, and lighting.

Storage and outputs

16 GB of internal storage and a 64 GB SD card (expandable to 256 GB). HDMI sends live video to a monitor, and USB-C handles charging and file transfer.

Typical applications

Aerospace

Automotive

Power generation

Orbital welding and tube inspection

Machining

02

What's in the Case

The EchoFlex ships in a foam-lined carrying case. Check the contents against your order when the system arrives, and return each component to its cutout after every use.

Each system ships with two batteries, one installed in the controller handle and one spare. Store the controller, probe, and accessories in the carrying case whenever the system is not in use.



CASE LAYOUT

- 1 Controller**
Handheld unit with the touchscreen and control keys.
- 2 Videoscope probe**
Probe module with its insertion tube.
- 3 Spare battery**
The second battery. The first is installed in the controller handle.
- 4 Base**
Stand that latches to the controller handle.
- 5 HDMI cable**
Connects the controller to an external monitor.
- 6 Charger and USB cable**
Battery charger, the USB cable for charging and file transfer, and the optional shoulder strap.

**NOTE**

Case contents vary with the probes and accessories ordered. Contact Zibra if anything on your order is missing.

03

System Components

The system is made up of four main components. They fit together as shown in Section 05, and the probe can be changed to suit the job.



1 Controller

The handheld unit. It holds the 5.5-inch touchscreen, the control keys, the SD card slot, and the HDMI and USB-C ports.

2 Videoscope probe

The interchangeable probe. It installs from the rear of the controller and includes the insertion tube and the articulating tip. Its joystick sits at the center of the keys once the probe is installed.

3 Battery

A rechargeable lithium-ion battery that slides into the bottom of the handle. It has its own charging port, and two are supplied with each system.

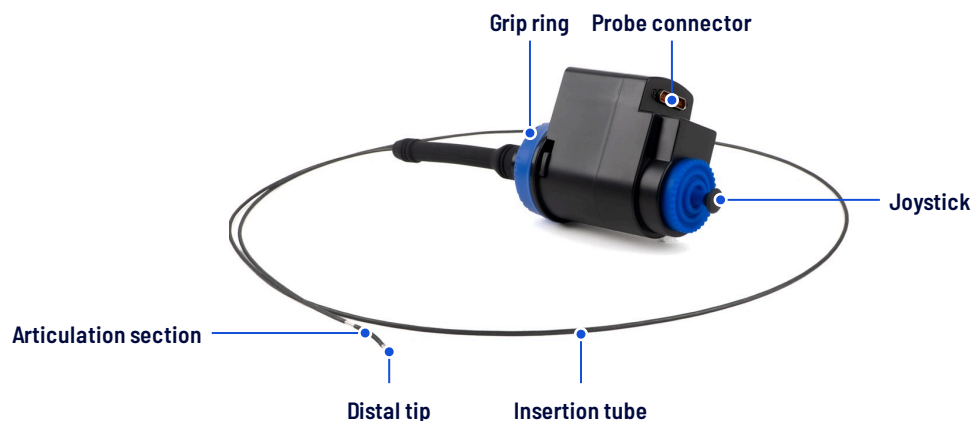
4 Base

A detachable base that latches to the handle. With the base attached, the controller stands upright on a work surface.

The videoscope probe

Insertion tube. The part of the probe that enters the inspection area. Feed it gently and never force it.

Articulation section. The section behind the distal tip, which carries the camera and LEDs. It bends in two or four directions, depending on the probe model, under joystick control.



NOTE

Probes smaller than 3.9 mm in diameter are rated IP64. Probes 3.9 mm and larger are rated IP67. Verify the rating of your specific probe model before any submersion.

04 Controls and Connections

With a probe installed, the joystick sits at the center of the front panel with the inspection keys grouped around it. The card slot and ports are on the sides of the controller.

FRONT



REAR



The Photo key is on the rear of the controller. The battery charging port is on the underside of the battery.

Key functions

KEY	ACTION	RESULT
Power / Menu	Press and hold for 3 seconds	Turns the system on or off.
	Short press	Opens the settings menu, or returns to the previous screen.
Joystick	Move	Steers the articulating tip of the probe.
	Press down	Holds the tip in its articulated position. Press down again to release it.
Photo key	Press	Captures a still image. The key is on the rear of the controller.
Recording key	Press	Starts recording video from live view. Press again to stop and save.
Playback key	Press	Switches between live view and your saved photos and videos.
Zoom key	Press	Steps through the digital zoom levels.
Light adjustment key	Press	Steps through five brightness levels for the probe LEDs.
Auxiliary light key	Press	Turns the auxiliary light on the rear of the controller on or off.

Connections

PORT	LOCATION	USE
SD card slot	Side of the controller	Holds the SD card that stores your photos and videos.
USB-C port	Side of the controller	Charging and data transfer. Connect to a PC with the supplied USB cable to view and manage the files on the SD card.
HDMI port	Side of the controller	Sends live video to an external monitor through the supplied HDMI cable.
Battery charging port	Underside of the battery	Recharges the battery with the supplied charger and USB cable.



NOTE

The touchscreen and the keys work together. Anything you can do with the Photo, Recording, and Playback keys can also be done from the on-screen menu described in Section 07.

05

Assembly

Follow these steps in order, and keep the power off until the probe is installed.



- 1 Install the battery**
Slide the battery up into the bottom of the handle until it seats.



- 2 Seat the base**
Align the protruding tab on the base with the groove and snap it into place.



- 3 Lock the base**
Press the blue latch and push up to fasten the base.



- 4 Insert the probe**
Insert the probe into the rear of the controller.



- 5 Tighten the grip ring**
Turn the rubber grip ring clockwise to tighten the probe in place.



- 6 Check the assembly**
The assembled system stands on its base, ready to power on.



- 7 Attach the strap**
To carry the system, attach the optional shoulder strap at the point shown.

**CAUTION**

Always install or change the probe with the power **off**. The system does not support hot-swapping, and changing a probe while it is powered on can cause a malfunction or a startup error.

06

Operation

A typical inspection has four stages: power on, inspect, capture, and shut down.

**CAUTION**

Connect the probe before you power on. The system does not support hot-swapping. Replacing a probe while the unit is on can cause a system malfunction or a startup error.

STAGE 1

Power on

- 1 Confirm that a fully charged battery and an SD card are installed.
- 2 Press and hold the **Power / Menu** key for 3 seconds. The system starts in live view.

STAGE 2

Inspect

- 1 **Set the lighting.** Press the **Light adjustment** key to turn on the probe LEDs. If you need more light around the work area, switch on the auxiliary light on the rear of the controller.
- 2 **Check the probe.** Before insertion, confirm that the insertion tube is free of kinks and that the tip is in the straight, neutral position.
- 3 **Navigate.** Feed the probe gently toward the target. Use the joystick to steer the tip and point the camera at the area of interest. To hold the tip in position, press down on the joystick, and press down again to release it.
- 4 **Refine the image.** Adjust the LED brightness and the digital zoom until the image is as clear as possible.

STAGE 3

Capture

- 1 With the target in view, press the **Photo** key to save a still image.
- 2 Press the **Recording** key to start a video, and press it again to stop. Files save directly to the SD card.

STAGE 4

Shut down and store

- 1 **Straighten the tip.** If the tip is being held in position, press down on the joystick to release it. Return the articulation section to the straight position before you withdraw the probe.
- 2 **Withdraw and power off.** Draw the insertion tube out carefully, then press and hold the **Power / Menu** key for 3 seconds to turn the system off.
- 3 **Store.** Return the controller, probe, and accessories to the carrying case.

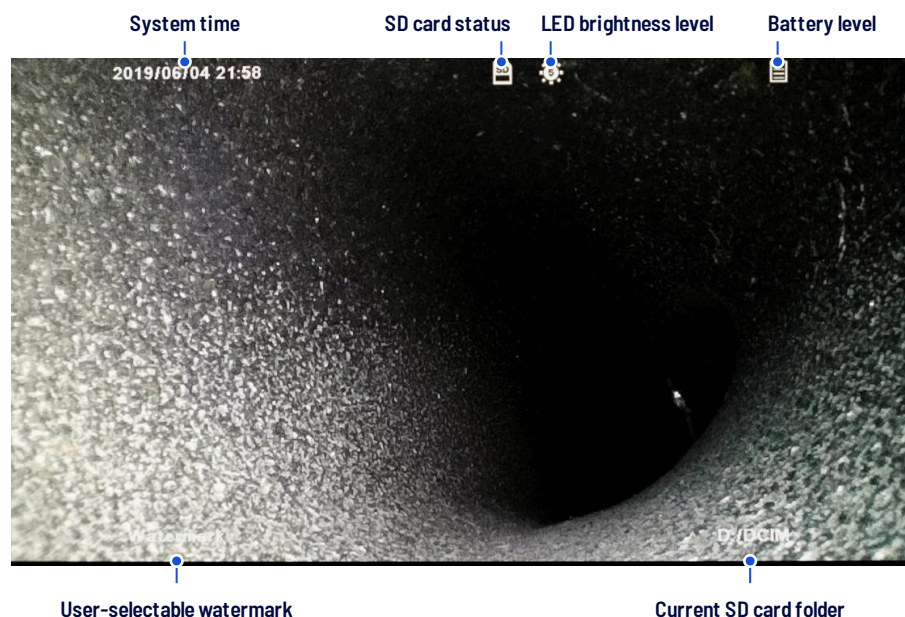
**CAUTION**

Never force the insertion tube when it is coiled, or when the tip is bent at a sharp angle. Forcing it can damage the internal components of the probe.

07

On-Screen Display

The touchscreen shows live video as soon as the system starts. Status information sits at the edges of the image, and a tap brings up the function menu.



Live view

On startup the display opens a full-screen live video feed. The status bar across the top shows the system time, the SD card status, the LED brightness level, and the remaining battery life.

The user-selectable watermark appears at the lower left, and the SD card folder currently in use appears at the lower right.

Function menu

Tap anywhere on the screen to show the function menu. Five image tools appear down the left side, and capture, playback, measurement, and settings appear down the right. Each function is described on the following pages.

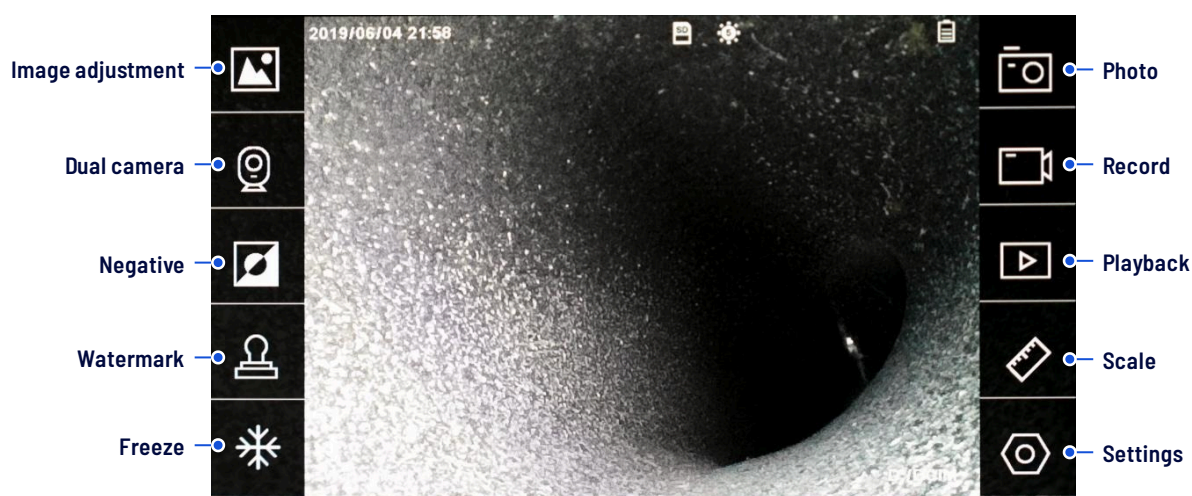
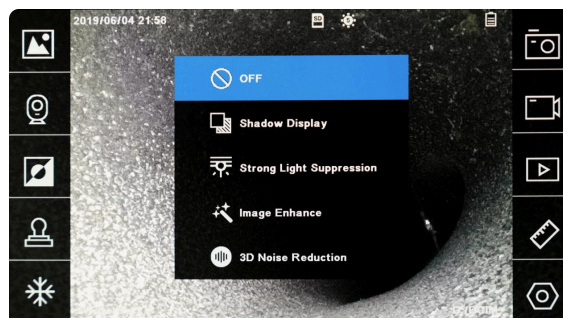


Image tools



Image adjustment

Opens a pop-up list of image display modes. Choose **Shadow Display**, **Strong Light Suppression**, **Image Enhance**, or **3D Noise Reduction**, or choose **Off** to return to the standard image.



Dual camera

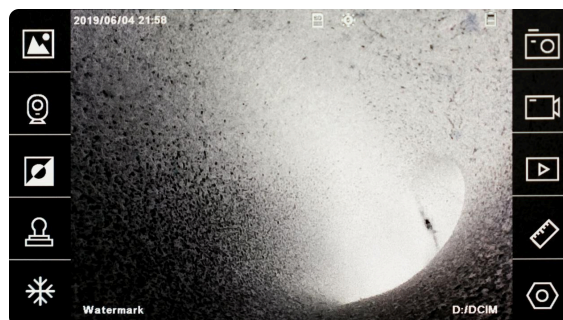
Shows more than one camera view on the screen at the same time when a binocular or dual-view probe is connected.

This function is not available with every probe model.



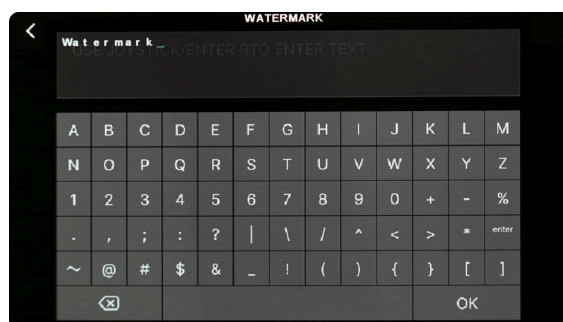
Negative

Inverts the image, so that light areas appear dark and dark areas appear light. Tap once to turn the negative view on, and tap again to turn it off.



Watermark

Opens the watermark settings, where you enter the watermark text. Type with the on-screen keyboard, then tap **OK** to confirm.



Freeze

Holds the current image on the screen while the camera keeps moving. Tap again to release the freeze and return to the live image.

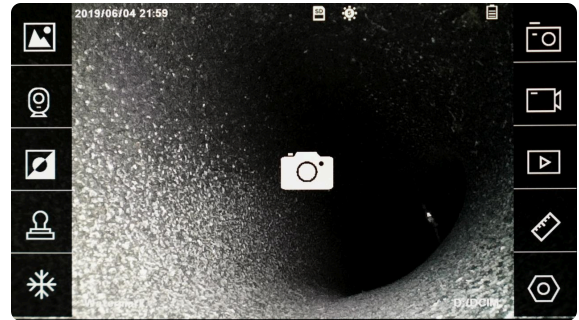
While the image is frozen, these functions are unavailable: rotation, negative, mirroring, photo capture, recording, split-screen display, white balance, screen proportion, scale measurement, and annotation. They return when you release the freeze.

Capture and measurement



Photo

Tap the icon, or press the **Photo** key, to take a picture. A camera symbol appears in the center of the screen to confirm that the image was captured.



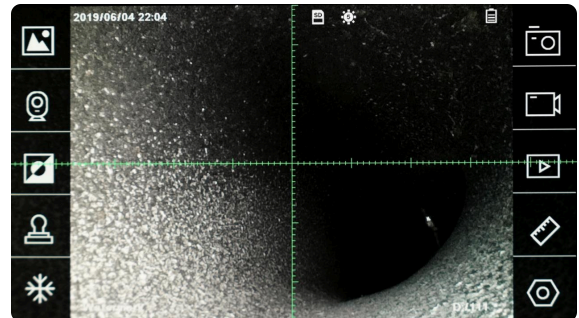
Record

Tap the icon, or press the **Recording** key, to start recording. The elapsed time is shown at the top of the screen while recording is in progress. Tap the icon or press the key again to stop.



Scale

Turns on a crosshair scale over the live image for comparative measurement.



Settings

Opens the settings menu. See Section 08 for a description of every setting.



NOTE

If Auto Save is switched off in the settings menu, you choose whether to save each photo or video to the card.

Playback and file management



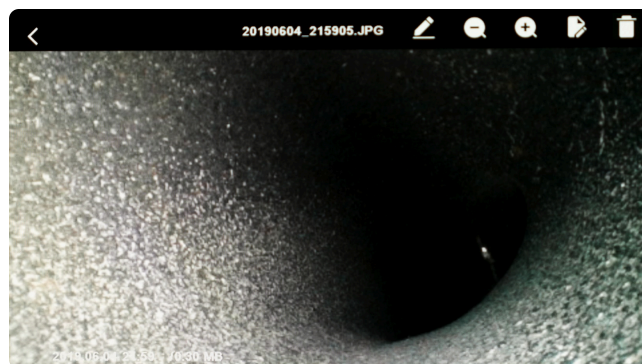
Playback

Tap the icon, or press the **Playback** key, to open the file browser. Photos and videos are shown as thumbnails, and the folder in use is named at the lower right. Tap any thumbnail to open it.



Playing a video

Tap a video thumbnail to open the player. Tap a blank area of the screen to pause.



Viewing a photo

Tap a photo thumbnail to open it. Use the icons at the upper right to zoom, rename, or delete the file.

File and folder tools



Zoom out or in on the open photo.



Rename the open file or the selected folder.



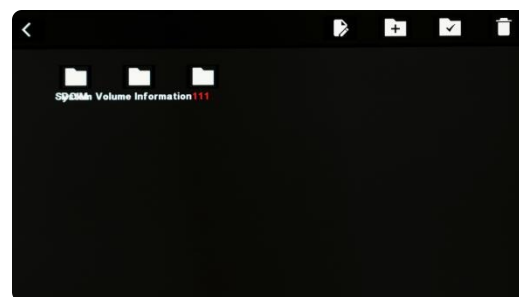
Create a new folder. The icon is at the upper right of the file browser. Three empty folders are provided by default, and you can keep tapping to add more.



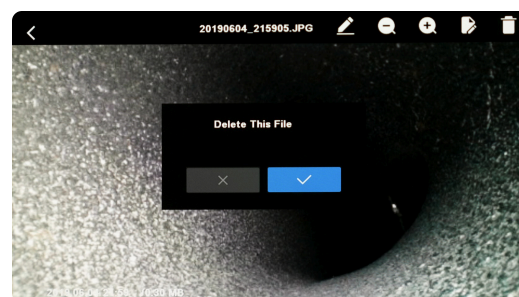
Set the selected folder as the save location. Its name turns red, and new photos and videos are saved there automatically.



Delete the open file or the selected folder. A prompt asks you to confirm.



FOLDER VIEW

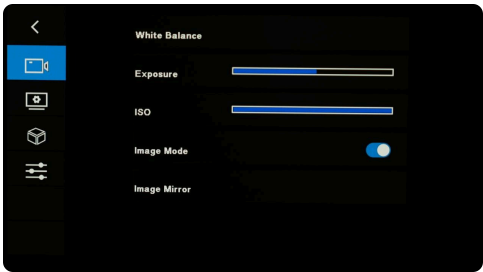


DELETE CONFIRMATION

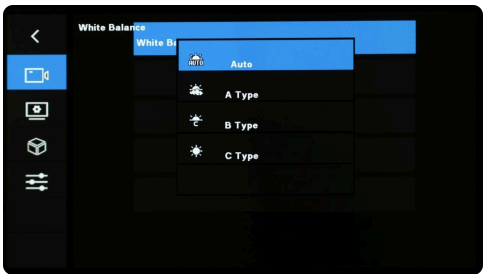
08 Settings

Tap the Settings icon in the function menu, or short-press the **Power / Menu** key, to open the settings menu. Four tabs down the left side group the settings by type.

Video settings



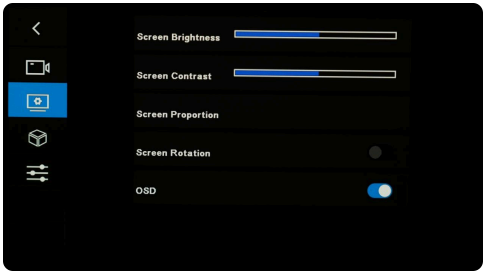
VIDEO SETTINGS TAB



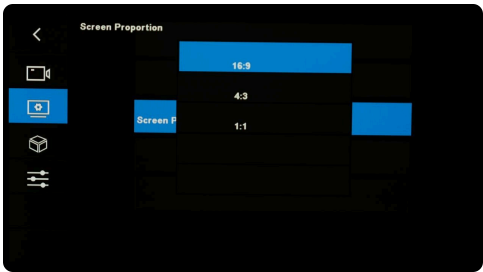
WHITE BALANCE OPTIONS

White Balance	Matches the image color to the lighting on the subject. Choose Auto, A Type, B Type, or C Type.
Exposure	Drag the slider to adjust exposure compensation.
ISO	Drag the slider to adjust the gain.
Image Mirror	Mirrors the image horizontally or vertically. Choose Mirror, Flip, or Off.

Screen settings



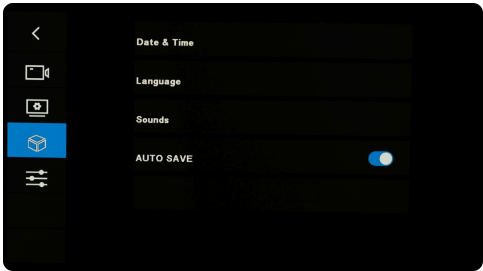
SCREEN SETTINGS TAB



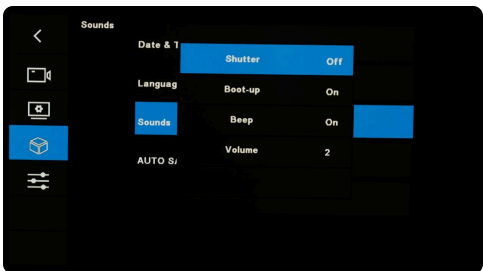
SCREEN PROPORTION OPTIONS

Screen Brightness	Drag the slider to adjust the brightness of the display.
Screen Contrast	Drag the slider to adjust the contrast of the display.
Screen Proportion	Sets the aspect ratio of the image. Choose 16:9, 4:3, or 1:1.
Screen Rotation	Rotates the display by 180°.
OSD	Shows or hides on-screen information such as the battery level, the time, and the watermark.

Application settings



APPLICATION SETTINGS TAB



SOUND OPTIONS

Date & Time

Sets the year, month, day, hour, minute, and second.

Language

Selects the display language.

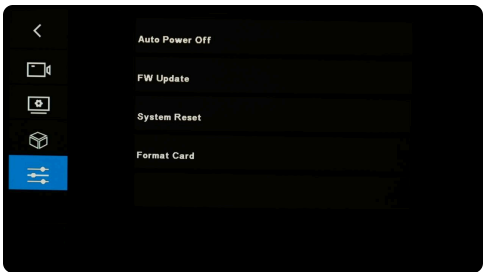
Sounds

Turns the shutter, boot-up, and beep sounds on or off, and sets the volume.

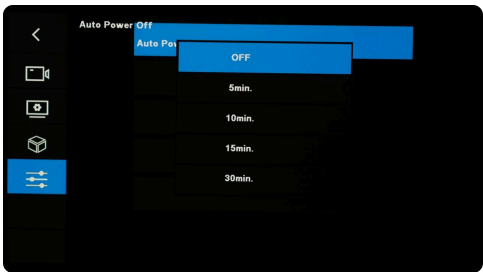
Auto Save

When on, photos and videos save to the card automatically. When off, the system asks whether to save each one.

System settings



SYSTEM SETTINGS TAB



AUTO POWER OFF OPTIONS

Auto Power Off

Sets the auto shutdown time. Choose Off, 5, 10, 15, or 30 minutes.

FW Update

Opens a prompt to choose whether to update the system firmware.

System Reset

Opens a prompt to restore the factory default settings.

Format Card

Opens a prompt to format the SD card in the controller.



CAUTION

Formatting erases every file on the SD card. Copy any photos and videos you need to a computer before you format the card.

09

Specifications

CONTROLLER

Display	5.5-inch color LCD touchscreen, 1920 × 1080
Housing	Injection-molded ABS
Operation	Physical keys and touchscreen
Articulation control	Joystick. Compatible with manual and motor-driven probes.
Interfaces	SD card slot, HDMI, USB-C
Storage	16 GB internal. 64 GB SD card included, expandable to 256 GB.
Image format	JPG, at 1280 × 720 or 1920 × 1080
Video format	MOV, at 1280 × 720 or 1920 × 1080
Image controls	Brightness, hue, saturation, contrast, white balance, exposure, gain
System settings	Date and time, language, auto power off, sound, zoom, SD card update
Languages	14, including English, Chinese, German, French, Japanese, Spanish, and Russian
Operating temperature	-10 °C to 50 °C (14 °F to 122 °F)
Protection level	IP64

PROBES

Design	Interchangeable
Diameters	1.8 mm to 8.4 mm
Lengths	Various, by probe model
Articulation	2-way or 4-way, by probe model
Illumination	LED at the distal tip. White light and UV models.
Image sensor	CMOS
Dual view	Available from 2.8 mm diameter
Protection level	IP64 under 3.9 mm diameter. IP67 at 3.9 mm and larger.

BATTERY

Type	Lithium-ion, 3.7 V / 9000 mAh
Supplied	Two per system
Charging time	Approximately 4 hours
Operating time	More than 3 hours

All terms, product features, and specifications are subject to change without notice.

10 Troubleshooting

SYMPTOM	WHAT TO CHECK
The tip does not bend normally	Check whether the insertion tube is knotted or tightly coiled. Straighten it before use.
No image	Check that the battery is charged and seated correctly, and that the probe is properly installed. Remove and reinstall the battery, then turn the system on again.
The image is blurry	The lens at the probe tip may be dirty. Turn the system off, wipe the tip of the lens clean, then restart and check the image.

11 Care and Safety

Follow these guidelines to protect your EchoFlex system and prevent accidental damage.

Insertion tube

Inspect the insertion tube before every use. Never operate the system with the tube knotted or tightly coiled, because this can break the internal articulation wires.

Cleaning

Do not submerge or wash the controller. Clean the screen and the probe with a soft, dry cloth before returning them to the carrying case.

Temperature

Use the system only between -10 °C and 50 °C (14 °F and 122 °F).

Interference and dust

Avoid using the system in strong magnetic fields or in excessively dusty environments.

Withdrawal

Always straighten the tip before removing the probe from an inspection site. Do not pull the insertion tube out forcefully or abruptly.

Handling and storage

Protect the system from drops, impacts, and heavy pressure. If it will be stored for an extended period, remove the battery to prevent leakage or corrosion.

Liquids

Keep the controller out of the rain. Probes are rated IP64 or IP67 by diameter (see Section 09), and no probe should be left submerged for extended periods.

Repairs

Do not attempt to disassemble the system. All maintenance must be performed by factory-authorized technicians.



NOTE

For the clearest photos and video, hold the probe tip steady and set the lighting before you capture.

12 Warranty and Service

WARRANTY STATEMENT

Zibra Corporation certifies that our factory products and accessories will be free of defects in materials and workmanship for one year from the date of first retail purchase. Video, lighting and some accessory products are covered by and subjected to the terms of the manufacturer's warranty.

Coverage

Controller	1-year limited warranty
Videoscope probes	1-year limited warranty. No warranty coverage on usage-related damage or failure.

Terms of service

Activation. The warranty begins on the date of purchase shown on the invoice. Defects verified to be caused by materials or manufacturing, under normal use, are repaired free of charge.

Shipping. Transportation costs to and from the repair facility are the responsibility of the purchaser.

Ownership. Any parts, circuit boards, or components replaced under warranty become the property of the manufacturer.

Exclusions

The following are not covered by the limited warranty and are subject to standard repair fees.

Misuse and accidents. Damage caused by improper storage, unauthorized modification, abuse, accidental drops, or incorrect installation.

Wear and tear. Normal degradation of consumables, and damage caused by operating outside the specified environmental limits.

Delayed reporting. Failure to report a defect in a timely manner, so that the repair request falls outside the warranty period.

Repair turnaround

Standard repairs are typically completed within 30 days of receipt, excluding shipping time. If specialized parts are required and the repair will take longer, a customer service representative will contact you with an updated timeline.



CAUTION

An RMA number is required. Contact Zibra to obtain one before shipping any equipment for evaluation.

All terms, product features, and specifications are subject to change without notice.



Service and Support

Contact Zibra Corporation with any questions about your EchoFlex system, probe options, or service. Please obtain an RMA number from us before shipping any equipment for evaluation.

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