

Bushnell®

EQUINOX™ X650



DIGITAL NIGHT VISION

OWNER'S GUIDE



PARTS AND CONTROLS GUIDE

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| A. Battery Compartment Cover | K. Zoom In |
| B. USB Port/Video Out/Micro-SD Card | L. Zoom Out |
| C. Eyepiece w/Diopter | M. Mode Button |
| D. Objective Lens | N. On/Off, Play, Record & Capture Button |
| E. Lens Cap/Filter | |
| F. Main Focus Ring | |
| G. Infrared (IR) Illuminator | |
| H. Tripod Adapter | |
| I. Picatinny Accessory Rail | |
| J. Display Focus Ring | |



Three AA Batteries Included

**USB Power Connection
Video Out Port
Micro SD Card Slot**



ABOUT BUSHNELL® EQUINOX X650™ DIGITAL NIGHT VISION

Congratulations on the purchase of your Bushnell® Equinox X650™ Digital Night Vision. Comprised of high quality electronics and optics, the Bushnell Equinox X650 is a hand-held digital night vision viewing system that utilizes an infrared sensitive CMOS sensor, providing edge-to-edge resolution and outstanding image quality. The Equinox X650 Digital Night Vision monocular is versatile enough for many applications including hunting, camping, boating/fishing, caving, paint ball, stargazing, rescue/recovery, security surveillance, law enforcement, and video recording in continuously changing light conditions – from dawn to absolute darkness. Not only can you view your subject at night, you can also record its image as a still photo or video clip, and store it on micro SD card.

HOW DIGITAL NIGHT VISION WORKS

Bushnell Digital Night Vision products collect existing light through the objective lens. The image is then processed through a digital CMOS sensor module and transferred to the micro liquid crystal display (LCD). Images viewed on the LCD are magnified 3.0, 4.5 or 6 times (depending on model). Equinox X650 Digital Night Vision models are equipped with a built-in powerful IR (infrared) illuminator that enables clear viewing in low ambient light conditions or even total darkness.

BATTERY AND SD CARD INSTALLATION

1. Install Fresh Batteries

- Remove the Battery Compartment Cover (**A**) by pushing the tab and slide down the cover. Insert 3 AA size batteries (alkaline or lithium), noting the polarity as marked inside the Battery Compartment.

2. Install Micro SD Card

- Open the rubber flap (**B**) covering the USB Port and Card Slot, and insert a Micro SD card (up to 64 GB, class 10 or greater for best results with video files) into the Card Slot (*metal contacts facing down*). The Equinox X650 has no internal memory and will not capture photos and/or videos unless a card is inserted.
- If you will only be using Equinox X650 for “live” viewing and do not wish to use it for photos/videos, the unit will function normally without a card.

BASIC OPERATION



1. Turn Power On

- Press and hold the Power Button (**N**) for 2 seconds to turn the unit on (the LCD display can be seen in the eyepiece).
- To turn the Equinox X650 off, press and hold the Power Button.

2. Check Lens Cap (remove for night and indoor operation)

- When using the Equinox X650 for daylight operation outdoors, it may be necessary to keep the Lens Cap (**E**) in place so it covers the Objective Lens (**D**). A filter is provided in the center of the Lens Cap which will permit only a minimal amount of light to enter the lens, strike the digital sensor and become amplified. As the Equinox X650 uses a digital sensor rather than a gas filled tube (traditional “analog” night vision), it is unlikely that you will damage any internal components in sunlight, but the image may be too bright to view or record unless the cap remains in place. The cap may be removed when using the Equinox X650 in normally lit interior areas.
- When operating the Equinox X650 at night or in low light conditions, remove the Lens Cap (**E**) from the Objective Lens (**D**). An attached strap prevents accidental loss of the Lens Cap when the lens is uncovered.

3. Adjust Eyepiece (diopter) and Main Focus Ring

- While viewing through the Eyepiece (**C**), rotate the Display Focus Ring (**J**) in either direction until the text and icons on the LCD display screen appears sharp to your eye. This is an adjustable diopter feature, used only to assure that the display will appear in focus to any user (eyeglass users may need to wear their glasses for best results).
- Next, while viewing an object at a distance of 5 feet or greater, rotate the large rubber Main Focus Ring (**F**) around the Objective Lens until the subject appears in focus.
- Always use the Main Focus Ring if your subject appears blurry, only turning the Eyepiece if the characters and icons of the display itself appear blurry.

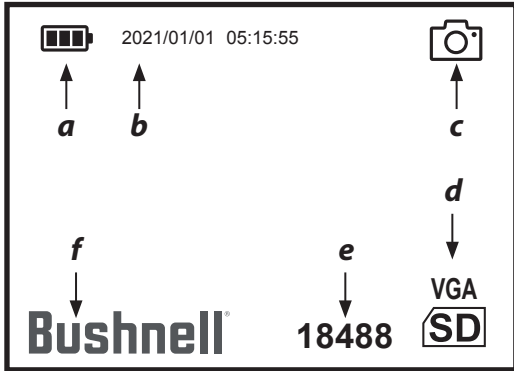
4. (Optional) Adjust Digital Zoom

A digital zoom feature is provided. While viewing normally, press the Zoom In button (**K**) to zoom in 0.5x increments, up to 5x (5 times normal) as indicated at the lower right corner of the display. Hold the button down to zoom in continuously. To zoom back out, press the Zoom Out button (**L**).

5. The Equinox X650 is equipped with a sensor to detect lighting conditions. The unit will automatically adjust sensor and IR illuminator settings.

DISPLAY ICONS AND INDICATORS (“HUD”)

After powering on the Equinox X650, multiple icons and text will be visible at the top and bottom of the display as viewed through the eyepiece. These overlaid icons and text are referred to as the “HUD” (heads up display). Pressing Select will enter the Settings Menu, which is described in the next section. First, here’s a look at the HUD overlay on the display, with a description of the function of each icon and phrase:

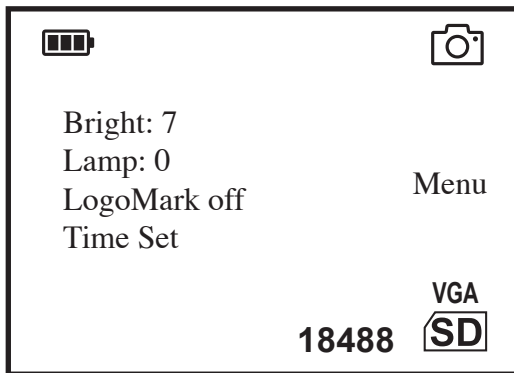


NORMAL VIEWING/PHOTO MODE DISPLAY

DISPLAY ICONS

	Icon	Function
a	Battery Level	Full solid=full power, 2/3 solid=two thirds power left, 1/3 solid=one third power left, Flashing=empty (replace)
b	Date/Time	Current time as set (12 or 24 hr format, can be hidden via Camera Setup menu)
c	Photo/Video/Play Back	Indicates photograph, video or play back with different icons
d	Mirco-SD Card	Solid=card installed, Flashing=no card
e	Photo Count/Video Time	Amount of pictures on SD Card. Elapsed time when recording, remaining time available for videos when stopped
f	Watermark	Visible=watermark on, Hidden=watermark off (per Camera Setup menu)

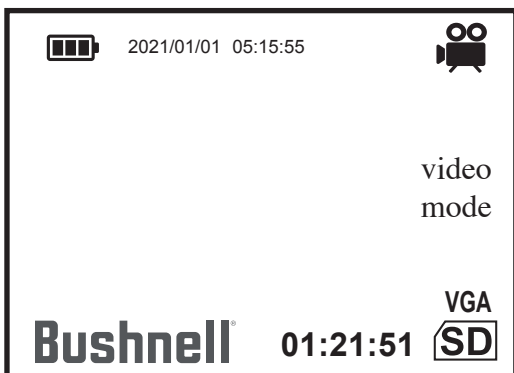
In Photo Mode, press the Power Button (N) to take a photo. In Video Mode, press the Power Button to start shooting a video. Press Record again to stop recording video. *Shortcut: press the Mode Button (M) to switch between Photo and Video Recording Modes.*



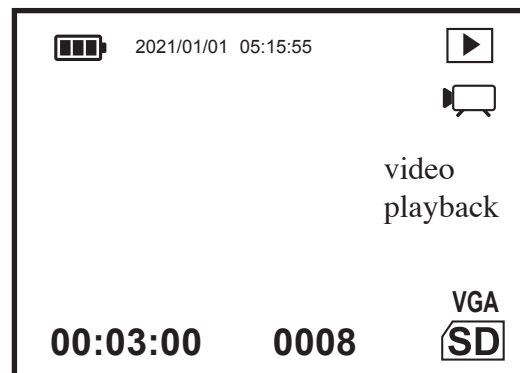
MENU DISPLAY



PHOTO PLAYBACK DISPLAY



VIDEO RECORDING MODE DISPLAY



VIDEO PLAYBACK MODE DISPLAY

NAVIGATING THE MENUS WITH THE KEYPAD AND SELECT BUTTONS

While viewing normally with the Equinox X650, pressing the Power Button (**N**) will activate the display icons (“HUD”), allowing you to check battery level, recording mode, day/night and IR illuminator settings, etc. After about 5 seconds, the display will return to the normal view, with no visible icons. The Settings Menu will allow you to optimize the Equinox X650 for the way you plan to use it, and to your personal preferences by selecting an option and then changing its setting.

To select the menu option you want and change its setting:

1. Press and hold the Mode button (**M**) to bring up the Menu Display. Press the Mode Button to navigate through the options: Bright, Lamp, LogoMark, Time Set. When the cursor is on the menu item you wish to adjust, press the Zoom Out Button (**L**). *Both the main and sub menus, as well as, the settings “wrap around”. This means that continuing to press Zoom Out after the last item will then move to the first item on the list. You can also press Zoom In (**K**) when the first item is highlighted to return to the last item.*
2. To adjust the Bright, Lamp and LogoMark settings, while the asterisk is on the setting you wish to change, press the Zoom In/Zoom Out Buttons (**K**) and (**L**) to adjust the settings to your preference. Brightness: 1-9, Lamp: 0-9, LogoMark: on/off.

Shortcut: from any menu screen, pressing the Record Button (N) will exit all menus and return you to the normal view with display icons.

Setting Date and Time:

In the Camera Setup Sub Menu, you should set the current date and time, so these will be correct as seen in the HUD display, as well as on the Timestamp for recorded videos (if you choose to enable it). The steps to set the date and time are as follows:

1. Press and hold the Power Button (**N**) to enter the Menu Display.
2. Press the Zoom Out (**L**) button to highlight “Time Set”.
3. The format is: Year/Month/Day Hour:Minute.
4. To set the year, press Zoom In/Zoom Out Buttons (**K**) and (**L**) to choose the correct year. Press the Power Button (**N**) to confirm the change and move to the next field. Continue to set the month, day. Repeat steps to set the minutes and seconds.
5. When finished setting the Date and Time, press the Power Button (**N**) button to go back to the main display.

RECORDING PHOTOS OR VIDEOS

Before using the image capture (recording) feature, a micro SD card must be installed (up to 64GB capacity, class 10 or higher speed recommended for video). If you are using a card which was previously used in another device, it is recommended that you format the card before recording with the Equinox X650. **As this will erase all files currently on your card, be sure you have backed up anything you wish to keep before formatting the card.**

You can capture a high resolution photo of what you are viewing through the Equinox X650 by simply pressing the Power Button (**N**). To record video clips (.mov format) instead of photos, press Mode Button (**M**) change the Recording Mode setting to “Video”.

REVIEWING AND DELETING PHOTOS OR VIDEOS

After photos and/or videos have been recorded by the Equinox X650, they can be viewed or played back from the micro SD card by pressing the Mode Button (M), highlighting “Gallery” and pressing the Select button. Use the Left/Right buttons to move through the stored photos/videos. Press Select to play a video, press again to pause, press Down to stop. Press Left/Right buttons to fast forward or rewind video during play.

To delete a photo, or a video (while viewing thumbnail image, not during play), press the Down button. A pop-up screen will ask you to confirm you want to delete the photo or video. Highlight “Yes” and press Select to delete the file from the card.


Photos and videos may also be reviewed by removing the micro SD card from the Equinox X650 (power it off first) and inserting it in a compatible card reader connected to your computer. You can also connect the Equinox to your computer (PC or Mac) with a USB cable and view the files stored on the card without removing it from the unit. Be sure to power on the Equinox X650 before plugging the other end of the USB cable into the computer. The connected Equinox X650 will be recognized and accessed by your computer the same way an external storage device (portable hard drive or flash drive) would be, as it conforms to the “USB Mass Storage” protocol.

Photo files use the standard JPEG format, video files use the .AVI format. “Eject” the Equinox properly when you are finished reviewing the files on the card before disconnecting it.

SETTINGS MENU REFERENCE

(default factory settings indicated in bold)

SUB MENU (CATEGORY)	OPTIONS/ITEMS	DESCRIPTION	SETTINGS
Night Vision	IR Illumination	Set infrared illuminator level or IR light	
Camera Setup	Recording Mode	Select photo or video image capture	Photo , Video
	Setup Date	Set current date for video timestamp	use Keypad+Select buttons
	Setup Time	Set local time for video timestamp	use Keypad+Select buttons
	Bushnell Watermark	Enable/disable watermark stamp on photos/videos	On , Off
Gallery	n/a	Review photos, playback videos, delete unwanted files.	
Display Settings	Day Brightness	Select viewing brightness for daytime	1 ~ 15 (8)
	Night Brightness	Select viewing brightness for night	1 ~ 15 (8)
	Display Time	Enable/disable displayed time	On , Off
Exit Settings	n/a	Exit all menus, return to normal viewing	Press Select button to exit

 **WARNING: DO NOT WALK, RUN, OR USE ANY FORM OF TRANSPORTATION (BICYCLE, MOTORCYCLE, AUTOMOBILE, ETC.) WHILE VIEWING THROUGH THE EQUINOX X650, AS THIS MAY PREVENT YOU FROM BEING FULLY AWARE OF YOUR SURROUNDINGS, INCLUDING ANY POTENTIAL OBSTACLES OR OTHER DANGERS IN YOUR PATH. USE ONLY WHILE STATIONARY, NEVER WHEN IN MOTION.**

CARE AND MAINTENANCE

Your Bushnell Equinox X650 was designed to provide many years of reliable service. To ensure that you get the most enjoyment out of your digital night vision device, follow these recommendations, guidelines and precautions:

- Keep the device away from any heating and air conditioning vents or other heating devices, direct sunlight, and moisture.
- Always store the unit in its carrying case in a dry well ventilated space in temperature above +15°C (60° F) and below +48°C (118° F). Do not store near heating devices. Do not store in direct sunlight or high humidity conditions (higher than 70 %).
- Clean the optical lens with camera lens cleaning supplies.
- Clean the exterior of the device with a soft clean cloth.
- Remove the batteries if the device will not be used for longer than a few weeks.
- Avoid dropping or otherwise shocking the unit. Although designed for rugged outdoor use, this device incorporates sophisticated digital circuitry which could be damaged in extreme cases of misuse.
- Do not open the body of the device or otherwise attempt to service this device.
- Never pour alcohol or any other liquids directly onto the lens surfaces.
- Do not clean lenses and unit surfaces with paper based products, such as newspaper, textbook paper, etc. as it can damage the coating.
- Do not attempt to remove the eyepiece as the LCD display could become damaged.
- Do not leave the device in direct sunlight or rain. The unit is water resistant, but is not designed for prolonged exposure to moisture and cannot be submerged in water.
- After the unit is operated in temperatures below zero, wait at least 3 hours at room temperature, to avoid condensation accumulating on the internal lens surfaces and the consequent fogging caused by extreme temperature differences.

TROUBLESHOOTING

Unit does not turn on

1. Reinstall the batteries, making sure of the correct polarity (+/- terminals) orientation (*refer to "Batteries Installed" photo on the Parts and Controls Guide page*).
2. Replace all batteries.
3. Clean the battery compartment, especially the contact points.

Image is blurry

1. Re-focus by adjusting the Main Focus Ring (**F**).
2. Adjust the diopter setting if necessary by rotating the Eyepiece (**J**) until the display icons appear sharp.
3. Check the condition of the objective lens surface and eyepiece and clean if necessary.
4. In low light conditions, make sure you are in Night mode and activate the IR Illumination.

Image disappears or its quality is reduced

Bright light sources (*e. g. street lights at night time*) may cause decreased visibility or reduced contrast.

- Turn the unit away from the light source; visibility will return momentarily.

Image at night is black and white

Viewed or recorded images at night appear black & white with no colors.

- This is normal, colors cannot be reproduced under dim conditions using IR illumination as the main source of light.

TECHNICAL SPECIFICATIONS

Specification	EX650
Magnification (optical)	5x
Max. Magnification (via digital zoom)	9x
Objective Size	32mm
Battery Type	4x AA, lithium, alkaline or NiMh
IR Illuminator Power/Wavelength	1W / 850nm
IR Illuminator Beam Width Angle	5 degrees
Max. Viewing Distance *	216 yds / 197 m
Field of View (degrees)	7.29
Field of View (ft@100yds)	23.2' x 17.4'
Dimensions (H x W x L)	69 x 85 x 190 mm
Weight	11.6 oz / 330 g
Tripod Mountable	Yes
Water Resistance Standard	IPX4

* In night mode, distance range is subjective and varies with subject viewed, ambient light intensity and other factors.



Products manufactured on or after June 2020 are covered by the Bushnell Ironclad Warranty. The Ironclad Warranty is a full lifetime warranty that covers the lifetime of this Product. Each Product has a defined lifetime; lifetimes can range from 1 to 30 years. This Product's lifetime can be found at the website listed below and/or on the Bushnell webpage specific to this Product.

We warrant that this Product is free from defects in materials and workmanship and will meet all represented performance standards for the lifetime of this Product. If this Product isn't working properly due to a covered defect, we will, at our option, either repair or replace it and ship it back to you at no charge. This warranty is fully transferable and does not require a receipt, warranty card, or product registration. This warranty does not cover the following: electronic components; batteries; cosmetic damage; damage caused by failing to properly maintain the product; loss; theft; damage as a result of unauthorized repair, modification, or disassembly; intentional damage, misuse, or abuse; and ordinary wear and tear. This Warranty will be void if the date stamp or other serialization codes have been removed from the Product.

To view the full warranty and find details on how to request service under the warranty, go to our website at www.bushnell.com/warranty. Alternatively, you can request a copy of the warranty by calling us at 1-800-423-3537 or writing to us at one of the following addresses:

IN U.S.A. Send To:

Bushnell Outdoor Products
Attn.: Repairs
9200 Cody
Overland Park, Kansas 66214

IN CANADA Send To:

Bushnell Outdoor Products
Attn.: Repairs
140 Great Gulf Drive, Unit B
Vaughan, Ontario L4K 5W1

For products purchased outside the United States or Canada please contact your local dealer for applicable warranty information.

This warranty gives you specific legal rights.
You may have other rights which vary from country to country.

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Note: failure to follow the warnings and precautions as stated in this manual may damage the unit and void the manufacturer's warranty.

FCC Statement

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 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.

Shielded interface cable must be used with the equipment in order to comply with the limits for a digital device pursuant to Subpart B of Part 15 of FCC Rules. Specifications and designs are subject to change without any notice or obligation on the part of the manufacturer.



Industry Canada Statement :

This device complies with ISED's license-exempt RSSs. 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.

Le présent appareil est conforme aux CNR d'ISED applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes: (1) le dispositif ne doit pas produire de brouillage préjudiciable, et (2) ce dispositif doit accepter tout brouillage reçu, y compris un brouillage susceptible de provoquer un fonctionnement indésirable.

Radiation Exposure Statement / Déclaration d'exposition aux radiations :

This device complies with the Industry Canada portable RF exposure limit set forth for an uncontrolled environment and is safe for the intended operation as described in this manual. Further RF exposure reduction can be achieved if the product can be kept as far as possible from the user's body or if the device is set to a lower output power if such function is available.

Le produit est conforme aux limites d'exposition pour les appareils portables RF pour les Etats-Unis et le Canada établies pour un environnement non contrôlé.

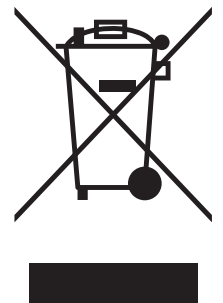
Le produit est sûr pour un fonctionnement tel que décrit dans ce manuel. La réduction aux expositions RF peut être augmentée si l'appareil peut être conservé aussi loin que possible du corps de l'utilisateur ou que le dispositif est réglé sur la puissance de sortie la plus faible si une telle fonction est disponible.

Disposal of Electric and Electronic Equipment (Applicable in the EU and other European countries with separate collection systems)

This equipment contains electric and/or electronic parts and must therefore not be disposed of as normal household waste. Instead, it should be disposed at the respective collection points for recycling provided by the communities. For you, this is free of charge.

If the equipment contains exchangeable (rechargeable) batteries, these too must be removed before and, if necessary, in turn be disposed of according to the relevant regulations (see also the respective comments in this unit's instructions).

Further information about the subject is available at your community administration, your local waste collection company, or in the store where you purchased this equipment.



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