L-Shine

LS-650

MULTIFUNCTIONAL NIGHT VISION 6X50

INSTRUCTION MANUAL

Contents

ABOUT LS-650 MULTIFUNCTION NIGHT VISION

Thanks for purchasing of our LS-650 Multifunctional Night Vision. Comprised of high quality electronics and optics, the LS-650 Multifunctional Night Vision is a portable digital night vision viewing system that utilizes an infrared sensitive CMOS sensor, providing edge-to-edge resolution and outstanding image quality. Fully multi-coated optics increase light transmission and decrease glare. The LS-650 6x50 Multifunction Night Vision monoculars are versatile enough for many applications including hunting, camping, boating/fishing, caving, paintball, 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 day and night, you can also record it's image as a still photo or video clip, and store it on micro SD card. The LS-650 6x50 Multifunction Night Vision units also include a video output port ***(G)*** (user switchable to NTSC or PAL standard), which allows connection to video or computer equipment for recording or "live" monitoring. A built-in accessory mounting rail ***(N)*** enables the user to attach a more powerful IR illuminator or other compatible accessories.

FEATURES

- Large Objective Size 50mm
- High Sensitivity infrared CMOS Sensor
- Long Viewing Range(in full dark) 350m
- Powerful Infrared Spotlight
- Accurate Focus Adjustment
- Optical magnification from 1.0x to 5.0x
- Wide field of view
- In-view 1.5" TFT display
- JPEG Display:2560X1920

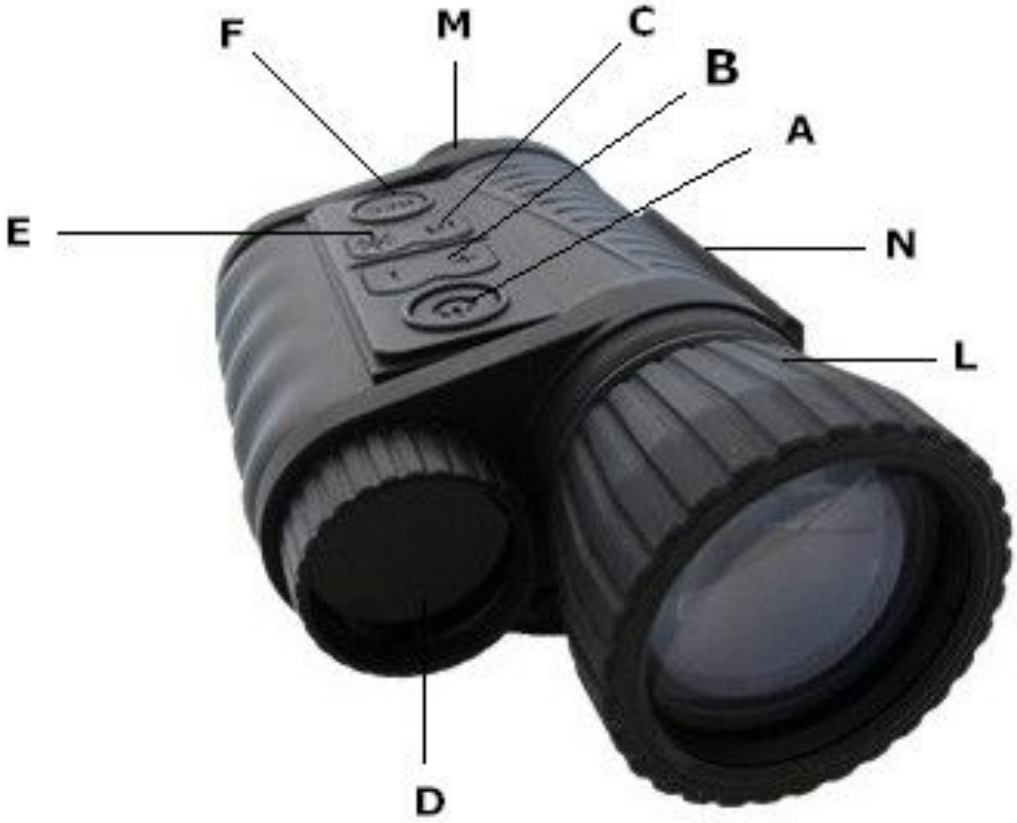
- Video:1280x720@20fps
- Build-In Clock
- Built-in tripod mountable
- Water Resistance Standard IPX4
- Resistant Bright Light Exposure
- Wide range of operating temperature
- TF card: up to 32G(no included)
- Magnification(optical): 6
- Intuitive Easy-to-use Interface

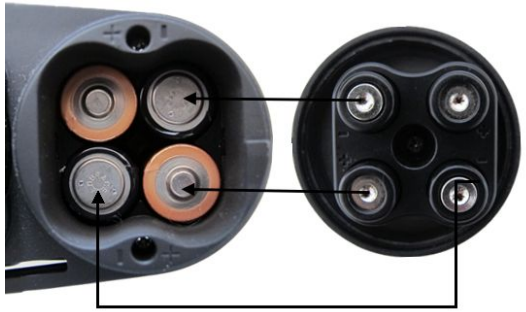
HOW DIGITAL NIGHT VISION WORKS

LS-650 Multifunctional 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 6 times. LS-650 Multifunctional Night Vision models are equipped with a built-in powerful IR (infrared) illuminator ***(D)*** that enables clear viewing in low ambient light conditions or even total darkness, further more LS-650 Multifunctional Night Vision can also be used in daytime as telescope and there is a crosshair at the central of the display for aiming and position.

CONTROLS/ FUNCTIONS

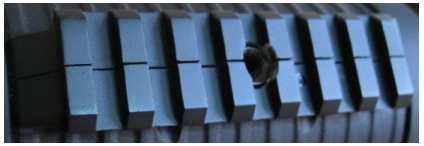
PARTS AND CONTROLS GUIDE





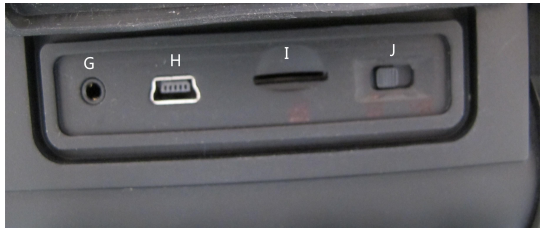
Observe battery polarity marks inside battery compartment when inserting batteries, and ensure polarity marks on cap match polarity in battery compartment when replacing cap (+ to + and - to -).

Side Mount Hole



Bottom Mount Hole

Under Interface Cover Flap



POWER BUTTON *(A)*

The Power button (Power icon) turns the unit ON or OFF.

- Press and hold the power button for 2 seconds to turn the unit ON
- Press and hold the power button for 2 seconds to turn the unit OFF

DIGITAL ZOOM BUTTONS *(B)*

The "+" and "-" buttons adjust the digital zoom power, with a range of 1.0x to 5.0x.
The displayed numbers represent a multiplication factor over the fixed optical magnification of the unit.
Maximum effective magnification = 5.0 x 6.0 (30x) for the 6x50 model.

- Pressing and releasing the "+" button will gradually "zoom in" to the subject in view, by 0.1x increments
- Pressing and holding the "+" button will rapidly zoom in, until the maximum 3.0x magnification factor is reached
- Pressing and releasing the "-" button will gradually "zoom out" from the subject in view, by 0.1x increments
- Pressing and holding the "-" button will rapidly zoom out, until the digital zoom returns to the starting point of 1.0x (no digital zoom applied, view represents the original 6x optical magnification)

IR BUTTON *(C)*

The "IR" button turns on/off the Infrared LED illumination *(D)* for low light operation, and is also used to reduce its brightness if necessary.

- Press and release the "**IR**" button to turn on the infrared LED light ***(D)*** when ambient light levels are too low to provide good viewing quality. The IR illumination will be at "100%" level when first turned on, and the display will indicate "**IR3**". The LS-650 model has 3 IR brightness settings.

- Press the "**IR**" button a second time to reduce the IR LED brightness level when viewing subjects at close range to avoid glare or "washout" of the image. The display will indicate "**IR2**". Press "**IR**" again if necessary on the 6xmodel, to reduce the IR LED brightness to its lowest setting, indicated by "**IR1"** in the display.

- Press the "**IR**" button again to switch off the IR LED light. "**IR0**" will be shown at the lower center of the display.、Switching off the IR LED when ambient light levels are adequate for viewing without it (full moon, near streetlights, etc.) will extend battery life and running time. Press the "**IR**" button once again to switch to DAY Mode-no IR value will be indicated.

IMAGE BRIGHTNESS BUTTON *(E)*

The Image Brightness (Sun Icon) button can be used to change the digital imaging frame rate, producing a brighter image for viewing or recording.

- Pressing the Brightness (Sun icon) button repeatedly will cycle through the available frame rates, beginning with the default frame rate (fastest), until the last (slowest, brightest) frame rate is reached. After that, the next press of the button returns back to the original fastest rate. The default, fastest frame rate in Night Mode is 25fps.Pressing the Brightness button cycles through the other frame rate settings, with the third press returning to the default again: 25fps>15fps>8fps>25fps>etc.
- In Day Mode, the default frame rate is 30fps. The frame rate cannot be changed in Day Mode, therefore the Brightness button will have no effect. The display is a color LCD, and images will appear in color in daytime use, or in strong artificial lighting conditions.

NOTE: selecting frame rates lower than the default 25fps in Night Mode will provide a brighter image, however the decreased frame rate may cause moving subjects to appear less smooth or stable when viewed.

RECORD BUTTON *(F)*

The Record button is used to capture still photos or videos of the image being viewed, dependent on the setting of the Photo/Video switch. The photos and/or videos are stored on a (user supplied) micro SD card, with up to 32GB capacity. The unit has no internal memory.

- When the unit is in Photo Mode, pressing the record button will take a single photo of the displayed image, standard .jpg format, at a resolution of 2592x1944/1600x1200/640x480 (adjustable) pixels.
- When the unit is in Video Mode, pressing the record button will start a new video recording. The Record icon in the display will begin flashing, and the Video Time display will increase as the recording continues. Video is captured in .avi format at a resolution of 1280x720/ 640x480 (adjustable) pixels per frame (VGA).
- To stop recording in Video Mode, press the Record button again.

(The following items are located on the bottom of the unit, under the Interface Cover Flap)

PHOTO/VIDEO SWITCH *(J)*

The Photo/Video slide switch under the Interface cover flap determines whether still photos or videos are captured when using Record.

- Set the switch to the "Photo" position to select still photo recording mode when the Record button is pressed.
- Set the switch to the "Video" position to select video recording mode when the Record button is pressed.

MICRO SD CARD SLOT *(I)*: a micro SD card (user supplied, up to 32GB maximum) must be inserted before it is possible to use the Record function. If a card is not inserted, the message "No Card" will be seen on the display when the unit is turned on.

USB PORT *(H)*: connect a USB cable (MSDC and PCCAM adjustable) between this port and a PC/Mac to download photos/videos without removing the card. The LS-650 is USB mass storage compliant.

VIDEO OUTPUT JACK *(G)*: the "live" image as seen on the unit's display is output here. Connect the included video cable (1/8" to RCA) (3.5mm) between this jack and a video monitor or recorder to remotely view or record the image from the night vision unit.

SETUP AND BASIC OPERATION

1) LOAD BATTERIES

Turn the battery compartment cover ***(K)*** in a counter-clockwise direction to remove it, and insert 4 AA batteries as indicated inside the battery compartment. Lithium AA batteries are recommended for maximum running time, but alkaline or rechargeable NiMh AAs may be used as well.

NOTE：DO NOT MIX BATTERY TYPES, OR NEW AND OLD BATTERIES. Remove the batteries if the unit will be stored for a month or longer between uses.

2）Installation of mount

The LS-650 can be used with various mount types such as Weaver, Europrism,Los, Side mount, MAK adapter etc. that allow the scope to be installed on different types of rifles.

The mounting holes in the base of the LS-650 enable the mount to be installed in one of the multiple positions. The choice of the mounting position helps the user to ensure the correct eye relief depending on the rifle type.

- Attach the mount to the base of the LS-650 using a hex-nut wrench and screws (see installation scheme).
- Install the scope on the rifle and check if the position is suitable for you.
- If you are happy with its position, remove the scope, unscrew the screws halfway, apply some thread sealant onto the thread of the screws and tighten them fully (do not overtighten). Let the sealant dry for a while.

- The LS-650 is ready to be installed on a rifle and to be zeroed.
- After first installation of your LS-650 on a rifle, please follow instructions in the section “Zeroing”.

Note*:*Please check that your LS-650 is duly zeroed after changing a mount.

3)REMOVE LENS COVER, ADJUST DISPLAY (EYEPIECE) FOCUS FOR YOUR VISION

- Press the Power button ***(A)*** to turn on the unit. A battery level icon is displayed at the top right corner of the screen.
- While looking through the eyepiece ***(M)*** at the LCD display screen, rotate the eyepiece (eyecup) until the display icons or edges of the display screen appear sharp to your eye.
- Remove the lens cover from the front of the objective lens ***(K)***.

Note: since the LS-650 uses digital night vision technology (not analog “Gen 1”, etc.), the unit cannot be damaged by exposure to normal indoor or outdoor light levels-however, you should avoid pointing it directly at the sun or other very bright light sources to avoid overloading the sensor.

4)TURN ON IR LIGHT (IF NEEDED), ADJUST OBJECTIVE LENS FOCUS FOR SUBJECT DISTANCE

- If the image is too dark to easily view (in most building interiors, and outdoors when away from artificial lighting), press the IR button ***(C)*** to turn on the Infrared LED light.
- If the image is too bright after turning on the IR light (when viewing at close range), press the IR button again to reduce the IR light level.
- If the image is still too dark after turning on the IR light, try pressing the Image Brightness button ***(E)*** once or twice to lower the frame rate of the digital sensor.

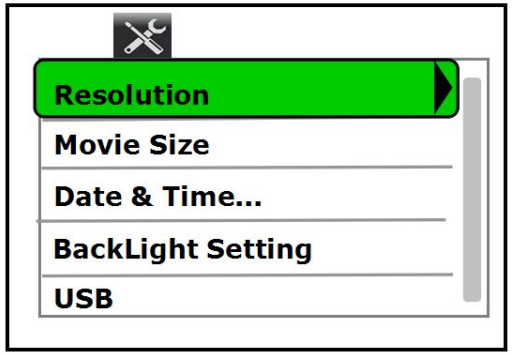
- If the image is not sharp, rotate the objective lens barrel ***(L)*** to change the focus until the subject appears sharp.

Note:Do not re-adjust the Display (Eyepiece) Focus (as set in Step 2), unless the display icons are unsharp.

5)ENTER INTO SETUP MENU INTERFACE

Press brightness level (E) switch and held for 2 seconds to enter the SETUP MENU INTERFACE.The SETUP MENU includes the following options:

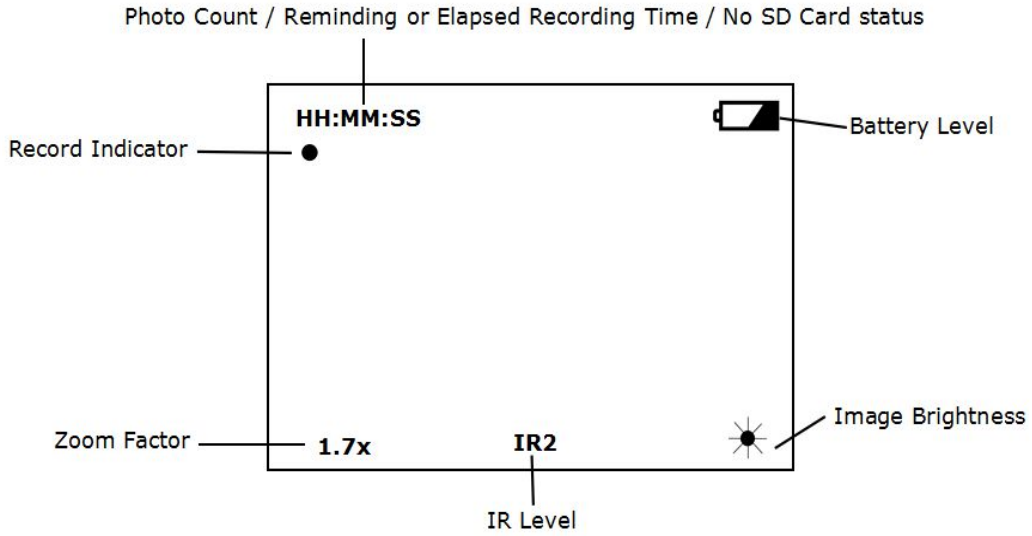
- Choice of Resolution
- Choice of Movie Size
- Date&Time set up
- BackLight Brightness set up
- USB



In setup interface, the buttons are given the following function.

- "-" button (B): enter into submenu, can be also used to lower the back light when in Back Light Setting interface;
- "+" button (B): drop out of one interface, can be also used to enhance the back light when in Back Light Setting interface;
- IR button (C): option key, can be also used to switch "DAYTIME LCD BRIGHTNESS" to "NIGHTTIME LCD BRIGHTNESS" or in turn setting;
- Image Brightness button (E): be used as confirm button when in Back Light Setting interface;
  Record button (F): confirm button.

DISPLAY ICONS



① **"#####", Photo Count**

When the device in photo mode,the number of photos reminding(memory available)will be displayed.

② **"00:00:00,"**

-Reminding Recording Time

When the device in video,and NOT recording, the remind recording time will be displayed (hrs/ min/sec).

-Relapse Recording Time

When the device in video,and recording, the elapsed recording time will be displayed (hrs/ min/sec).

③ **"NO CARD"**

When an SD card no inserted into the card slot,the"No Card" will be displayed.

④ **" ● " Record Indicator**

When the device in video mode, it will be displayed.

⑤ **"1.7x" Zoom Factor**

The digital zoom magnification factor will be displayed, in 0.1x increments from 1.0x ~ 5.0x.

⑥ **"IR2" IR Level**

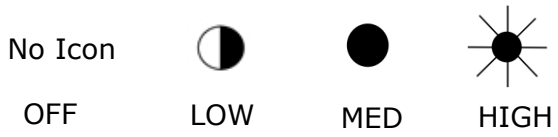
IR3(6x)/IR2(4.5x)=Normal; IR2(6x)/IR1(4.5x)=Low
IR1(6x only)=Very Low; IR0=OFF; No Icon=DAY Mode.

⑦ **Battery Level**

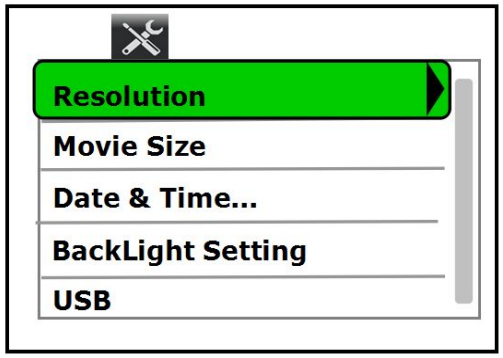
This icon indicate the reminding battery power level.

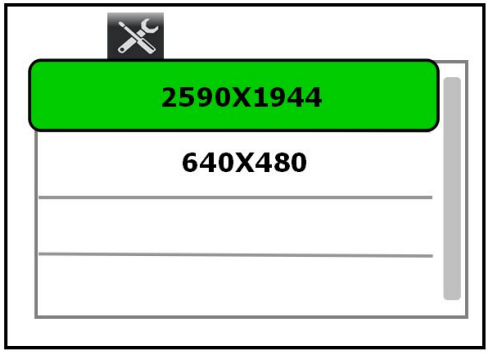
⑧ **Image Brightness(frame rate)**

OFF=Day/30fps; LOW=Night/25fps;
MED=Night/15fps; HIGH=Night/8fps

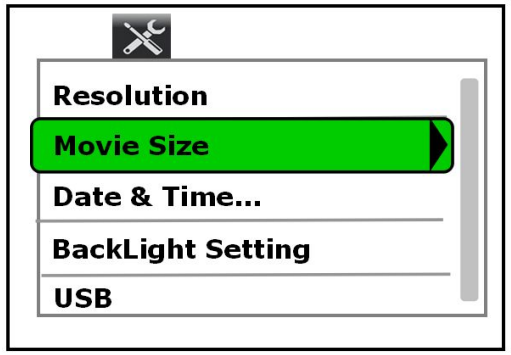


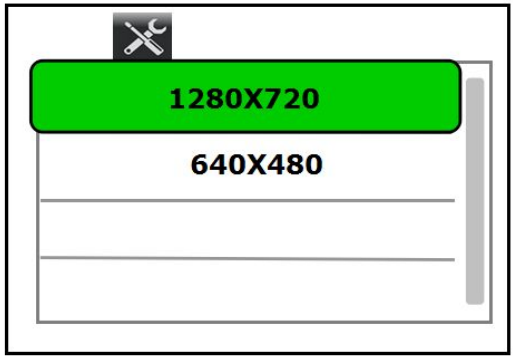
- **Resolution:** press "-" button ***(B)*** and enter into adjust interface, press IR Button ***(C)*** to choose your favorable resolution: 2592x1944, 640x480. 2592x1944 would be much clearer but 640x480 would take less storage space. After choosing, press the record button ***(F)*** to confirm or "+" button ***(B)*** to drop out of setting.



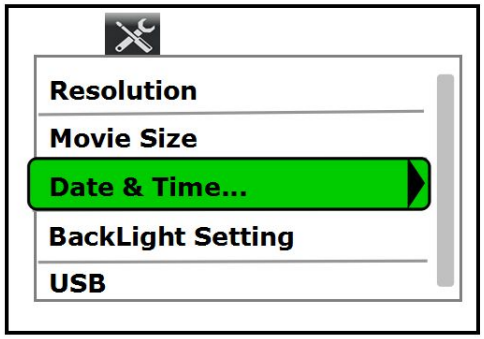


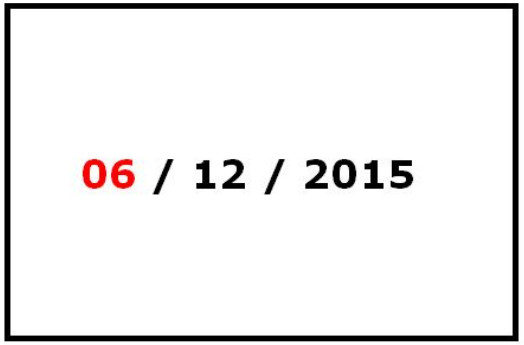
- **Movie Size:** press "-" button ***(B)*** and enter into adjust interface, press IR Button ***(C)*** to choose your favorable movie size: 1280x720, 640x480. 1280x720 would be much clearer but 640x480 would take less storage space. After choosing, press the record button ***(F)*** to confirm or "+" button ***(B)*** to drop out of setting.

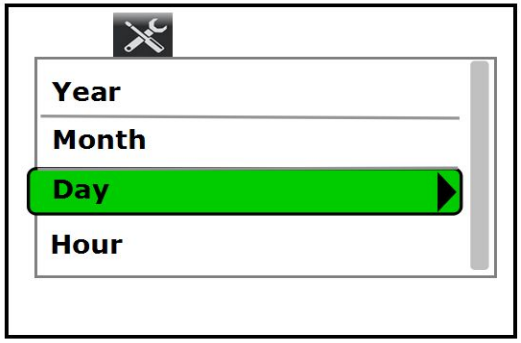




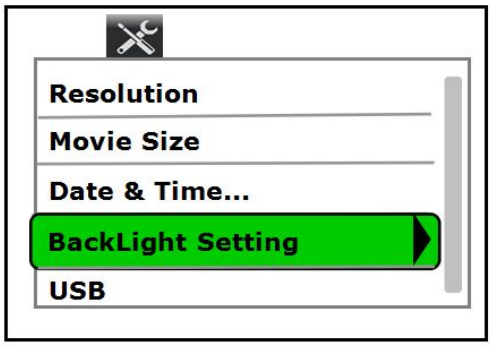
- **Date &Time:** press "-" button ***(B)*** to check the default time & date, if need to adjust, press the "-" button ***(B)*** enter into adjust interface, press IR Button ***(C)*** to select Year/Month/Day/Hour/Minute then press "-" button ***(B)*** enter for choosing the right number, after that, press the record button ***(F)*** to confirm.

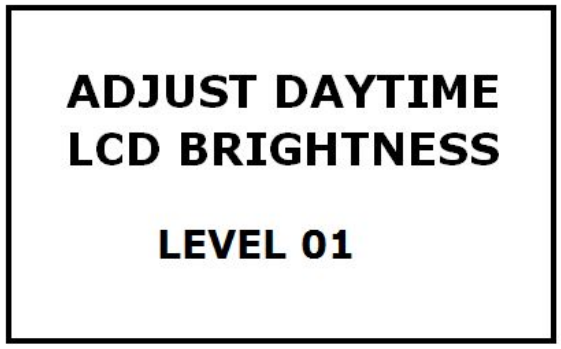


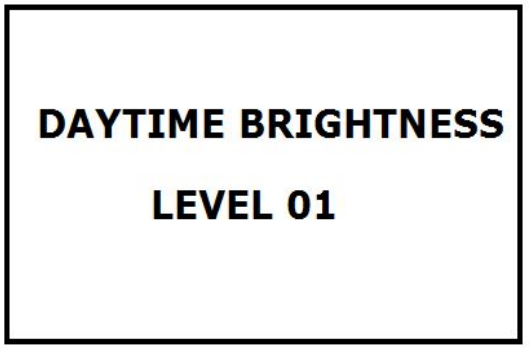




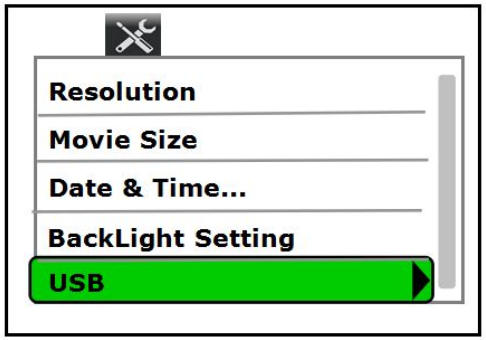
- **Backlight Setting:** press "-" button ***(B)*** to enter into Backlight setting interface. The LCD backlight level can be toggled from Level 00 to Level 03,press "+" and "-" button to adjust, this allows you to quickly make a significant change in viewing brightness, and also provides a greater total range of adjustment. After finish the setting, press image brightness button ***(E)*** to confirm.

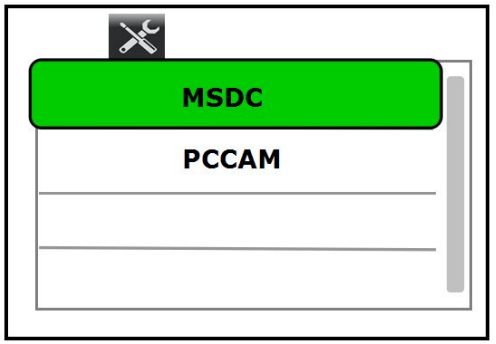






- **USB:** Press "-" button ***(B)*** enter into setting interface, press IR Button ***(C)*** choose MSDC or PCCAM then press Record button ***(E)*** to confirm and exit.





OTHER OPERATIONS/FEATURES

- **AUTO POWER OFF**
  If a button has not been pressed for 10 minutes, the display screen will drop to 50% brightness level. If no button is pressed within one minute after that, the unit will power off to extend battery life. Pressing any button quickly any time before the unit turns off will return the screen to full brightness level and reset the auto off countdown process, without changing any other settings.

- **ICON OVERLAY ON/OFF**
  The user has the option to control how the icons are displayed on the LCD screen. Normally, when any button is first pressed, All icons are displayed for 5 seconds, but no change to the unit's settings is made (the Record and IR buttons is an exception-image capture begins immediately the first time "Record" is pressed, and the IR light turns on at the first press of "IR"). If the same button is pressed again, the button performs its function, and the display icons remain visible for 10 seconds after the last press, before turning off automatically. To display all icons

constantly, press and hold the IR button for 3 seconds. Repeat to switch back to auto icon overlay (only visible for 10 sec. max following the use of a button).

- **USING THE DIGITAL ZOOM**

  Press the "+" button ***(B)*** to zoom in. Press the "-" button ***(B)*** to zoom out. Hold the button down to zoom in/out rapidly. The Digital Zoom icon at the lower left corner of the display will indicate the magnification factor, from 1.0x to 5.0x (in 0.1x increments).

- **SELECTING PAL OR NTSC VIDEO OUTPUT**

  The Video Output jack ***(G)*** is set to NTSC format (30fps TV standard in the USA, Canada, Mexico, etc.) by default. To select PAL video output (25fps) format as used in other countries,

  - Connect the unit to your video device first.
  - Hold both the IR button ***(C)*** and Image Brightness ***(E)*** buttons down for 5 seconds while viewing the display through the eyepiece.
  - When the display changes to "PAL", release the buttons.
  - To switch back to NTSC video output format, hold both buttons for 5 seconds until the display indicates "NTSC", then release the buttons.

Note: The"Auto Off" feature is disabled when using the Video Output jack.

TECHNICAL INSPECTION

It is recommended that you inspect the sight before every use. Make sure to check for the following:

- Visually inspect that the unit is free from any physical damage; cracks, dents or signs of corrosion which may

disqualify it from proper use.

- Check the sturdiness and proper fit of the mounting system.
- Ensure that the objective lens and eyepiece are free of cracks, grease spots,dirt, water stains and other residue before use.
- Visually inspect the condition of the battery and the battery compartment; the battery should be free of electrolyte and oxidation residue, especially where the battery makes contact with metal.
- Verify the proper function of the following: selector switch, display brightness adjustment knob and other operation buttons.
- Verify the smoothness of the objective lens focus knob, dioptre focus knob.

WARNING AND PRECAUTIONS

- 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.
- Avoid removing 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.

TECHNICAL MAINTENANCE

Technical maintenance should be done at least twice a year, includes the following steps:

- Clean the outside metal and plastic surfaces from dust, dirt and moisture;wipe the scope with a soft lint free cloth.
- Clean the battery compartment's electric contact points using an oil-free solvent.
- Inspect the eyepiece lens and the objective lens and gently blow off any dust and sand, and clean using lens cleaner and a soft cloth; see section 6 “GUIDELINES FOR OPERATION”.

CARE AND MAINTENANCE

Your LS-650 Digital Night Vision device was designed to provide many years of reliable service. To ensure that you get the most enjoyment out of your Digital Night Vision device, always obey the following warnings 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). 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.

TROUBLESHOOTING

Unit does not turn on

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

Observed image is too bright

The ambient light level is too high, and/or the IR light is at 100% level (IR3).

1. If you are using the IR light, press the IR button (C) to select a lower illumination level (IR2 or IR1).
2. Turn off the unit or place the objective lens cover over the lens.

Observed image is too dark

The ambient light level is too low.

1. Press the IR button ***(C)*** to activate the Infrared Light.
2. Press the Image Brightness button ***(E)*** to select a lower frame rate from the digital sensor.

Image is blurry

1. Re-focus by adjusting the objective lens ***(L)***. Adjust the diopter setting if necessary by rotating the eyepiece (M) until the edges of the LCD display appear sharp (see "Focusing " in this instruction manual).
2. Check the condition of the objective lens surface and eyepiece and clean if necessary.
3. Replace the batteries.
4. In low light conditions, activate the IR illumination ***(C)***.

Image disappears or its quality is reduced

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

1. Turn the night vision unit away from the light source; visibility will return momentarily.

TECHNICAL SPECIFICATIONS

Magnification (Optical)	6x	Battery Type	4xAA,lithium,alkaline or NiMh
Digital Zoom	5	Battery Runtime (IR OFF)	4 Hours
In-view display	1.5" TFT	Battery Runtime (IR ON)	3 Hours
Field of View @ 100 yds/m	20.5ft/6.8m	Built-in 2tripod mountable	YES
Objective Lens	50mm	Weaver Rall	YES
Micro SD Card	UP To 32 GB	Crosshairs	YES
Viewing Range	1150ft/350m	Time Stamp (Picture &Video)	YES
Obj. field	100yds	Video Out Type	PAL/NTSC
Eyepiece exit pupil distance	20mm	USB	1.1
Eyepiece exit pupil diameter	18mm	Language	English
Infrared Illuminator	Yes, 850NM	Power Voltage	6V
JPEG	2592 x 1944	Dimensions	62x105x208mm
Video	1280 x 720@20FPS	Weight	765g
Observing Distance(Low Ambient Light)	2m ~ ∞	Waterproof grade	IPX4
Observing Distance(Total Darkness)	1150ft/350M	Operation Temperature	-30~55C
Video Out	PAL or NTSC	Operation humility	5% ~ 95%
Field of view	4° x3.3°	Security authentication	FCC, CE, RoHS

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

ONE YEAR LIMITED WARRANTY

Your LShine product is warranted to be free of defects in materials and workmanship for one year after the date of purchase. In the event of a defect under this warranty, we will, at our option, repair or replace the product, provided that you return the product postage prepaid. This warranty does not cover damages caused by misuse, improper handling, installation, or maintenance provided by someone other than a Bushnell Authorized Service Department.

Any return made under this warranty must be accompanied by the items listed below:

1. A check/money order in the amount of $10.00 to cover the cost of postage and handling
2. Name and address for product return
3. An explanation of the defect
4. Proof of Date Purchased
5. Product should be well packed in a sturdy outside shipping carton, to prevent damage in transit, with return postage prepaid to the address listed below:

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

LS-650

L-Shine

(0086)0769-86836877

www.lshine.com