

# INSTRUCTION MANUAL

## Orion® StarShoot™ LCD-DVR

#58125



The Orion StarShoot LCD-DVR is a highly portable viewing and recording device for video cameras (& other devices) with composite output video signals (NTSC or PAL).

With this device astronomers can easily attach a video camera to a telescope to view and record color images and movies on its high resolution 2.5" TFT true color LCD screen.

Images and movies can be recorded to SD Cards up to 32G (2G SD Card included).

Movies and Images can be played back on the device itself, played back through a TV (NTSC or PAL), copied via SD Card or copied directly to computer using the Included USB cable.

Please read this instruction manual before attempting to use the device.



*Providing Exceptional Consumer Optical Products Since 1975*

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## Parts List



**Figure 1.** Included items.

- StarShoot™ LCD-DVR
- Leather case
- IR Remote Control
- AV Cable
- Mains AC->DC Power Adapter
- Wired Control Button
- Rechargeable Lithium battery
- USB Cable
- 2G SD card
- Velcro strip to optionally attach device to telescope

## LCD-DVR

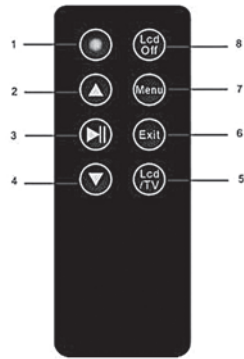


**Figure 2.** The Orion StarShoot LCD-DVR.

- |                                     |                      |
|-------------------------------------|----------------------|
| 1. Power On/Off                     | 11. Reset Button     |
| 2. Charge LED                       | 12. Lock Switch      |
| 3. Internal Microphone              | 13. Internal Speaker |
| 4. AV Input & DC Out jack           | 14. SD Card Socket   |
| 5. Low Power LED                    | 15. IR Sensor        |
| 6. Record / Stop Button             | 16. Down Button      |
| 7. Power On/Record LED              | 17. Up Button        |
| 8. DC 5V In Jack                    | 18. Select Button    |
| 9. USB Port                         | 19. Esc Button       |
| 10. AV Out / Control Button In Jack | 20. Menu Button      |

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## IR Remote Control




**Figure 3.** IR Remote control.

- |                       |                   |
|-----------------------|-------------------|
| 1. Record/Stop button | 5. LCD/TV Button  |
| 2. Up Button          | 6. Exit Button    |
| 3. Select Button      | 7. Menu Button    |
| 4. Down Button        | 8. LCD Off Button |

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## Basic Operation

Please charge the internal mobile battery for over 3 hours before you begin recording.

 Turn on the LCD-DVR by pushing the Power On/Off switch in the direction of arrow and holding until the red LED turns on. You will briefly see the startup screen (Figure 4) before entering the Camera Manager Screen (Figure 6).

Turn off the LCD-DVR by pushing the Power On/Off switch in the direction of arrow and holding until the shutdown screen appears before turning itself off (Figure 5).







**Figure 4.** Startup Screen.



**Figure 5.** Shutdown Screen.

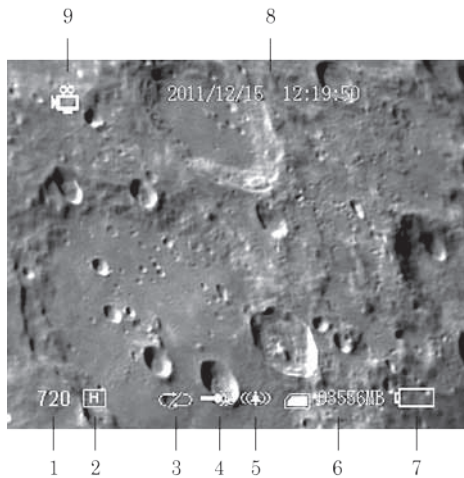
### Navigation buttons

Use the navigation buttons below to make menu selections.

-  Press **Menu** button for Main Menu
-  Press **Up/Down** buttons for selection / Volume
-  Press **Esc** button to exit
-  Press **Select** button to select choice

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## Camera Manager Screen



**Figure 6.** Camera Manager Screen.

- |                      |                        |
|----------------------|------------------------|
| 1. Image Size        | 6. SD card info        |
| 2. Resolution        | 7. Battery Capacity    |
| 3. Overwrite On/Off  | 8. Date and Time Stamp |
| 4. In/Out Microphone | 9. MODE                |
| 5. Vibration On      |                        |

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## Recording Methods



### Manual

Push the Record / Stop Button on the side of the LCD-DVR to “Rec” to start recording.

Push the Record / Stop button to “Stop” to stop recording.



### IR Remote Control

Press the Record / Stop Button on the IR Remote to Start / Stop recording.



### Push Button

Plug the Wired Control Button into the AV Out port on the LCD-DVR.

Press and hold Red button to automatically turn on LCD-DVR and start recording.

Press and release Red button again to stop recording and turn LCD-DVR off.

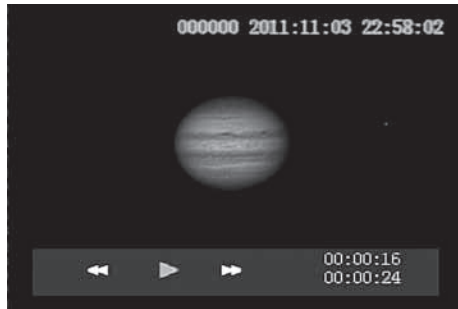
### Motion

Automatically start recording when motion is detected according to sensitivity setting.

For more information see **Recorder Settings → Motion Detect.**

# Playback Methods

## On Device (LCD)



Playback movies, stills and audio via the high resolution 2.5", TFT true color LCD screen.

For more information see **Playback Settings** → **Video Playback** section of this manual.

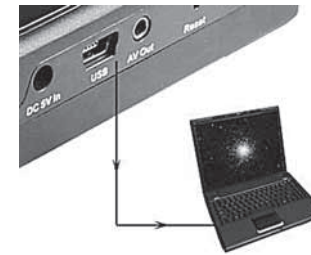
## TV Out



Playback movies, stills and audio on a TV (NTSC or PAL)

For more information see **System Settings** → **Video Output** section of this manual.

## USB



Copy movies, stills and audio from the LCD-DVR directly to computer hard drive for playback on laptop / PC or for further processing.

Plug USB cable into computer and LCD-DVR in order for password protection window to appear.



Enter correct password to be able to access recordings directly from computer. The default password is 00000 for connecting to PC.

The LCD-DVR will be powered off automatically when you disconnect the USB from PC.

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## SD-Card



Eject SD-Card from LCD-DVR and conveniently place into other devices that include SD-Card port.

A 2G SD-Card is included with the LCD-DVR.

The LCD-DVR can accept SD-Cards up to 32G.

The recording time will vary based upon quality setting of recording.

Recording time:

15 minutes~2.5 hours per 1G SD-Card

8 hours~80 hours per 32G SD-Card

The included 2G SD-Card comes pre-installed with:

- Movies recorded with Orion video cameras
- Images that were recorded with Orion Video Cameras and then enhanced using astronomical post processing software such as Registax, MaximDL and Photoshop.
- Orion Video camera training Videos

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## Connecting External Devices

### Connect to external cameras




Use the included AV cable to connect Video Cameras or other composite Video out devices such as DVD, VCR, DVR and Video Game Consoles to the LCD-DVR using the AV-In port.

The yellow RCA connector is for video, the white and the red RCA connector are for audio;



*NOTE: if the video signal and SD card are unavailable the LCD-DVR will alarm by vibration and red warning text will appear on screen.*



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## Main Menu Screen

From the **Camera Manager** screen Press the  Menu button to bring up the **Main Menu** screen.



 Select **Recorder Settings** icon and press  **Select** button to enter **Recording settings** menu.

 Select **Device Settings** icon and press  **Select** button to enter **Device settings** menu.

 Select **Playback Settings** icon and press  **Select** button to enter **Playback settings** menu.



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## Recorder Settings

### Mode



There are three work modes for selection:

- **Video** – Record Movie (AVI file format)
- **Photo** – Record Photo (JPG file format)
- **Audio** – Record Audio (WAV file format)

### Video

This mode is the suggested mode for astronomers so that post processing techniques (such as stacking) can be accomplished using hundreds of frames.

### Photo

This mode allows user to take individual images manually or automatically.



### Manual Recording

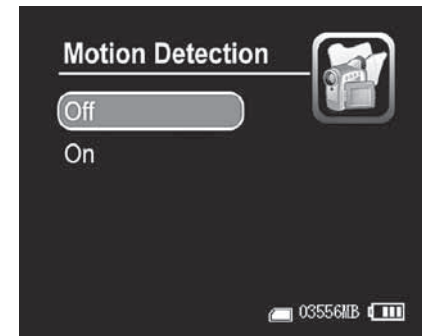
This option will record one frame each time user presses the record button on the remote control or manually selects the record switch on the LCD-DVR.



### Auto / Time-Lapse Recording

When selecting Auto Photo Mode the user is presented with the Capture Time Setting menu in order to enter the time delay in seconds between each successive frame. Press record button on remote or use the record switch on LCD-DVR to activate automatic/time-lapse recording. The camera icon on the screen will flash every time a new frame is recorded. Frames are continually recorded until user stops recording. This feature can be used for creating time-lapse movies where the user can take the recorded frames and use software to stitch images into a time-lapse movie file or use the individual files for stacking within astronomical software.

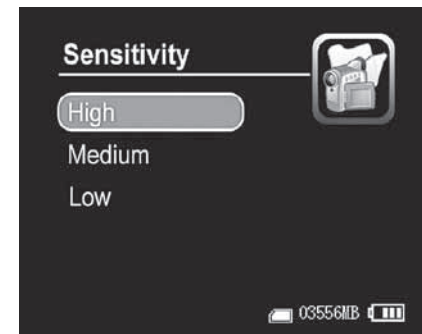
### Motion Detection



Select On or Off to enable or disable the Motion detection recording function, When the motion detect record function is on, and the Record / Stop switch is pushed to the "Rec" side, a motion can trigger an automatic recording.



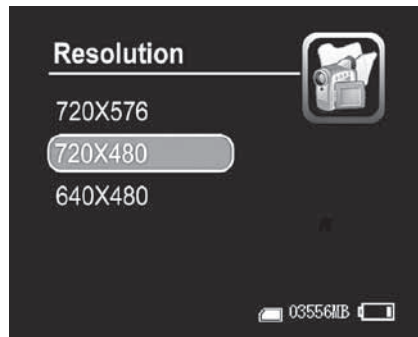
### Sensitivity



There are three settings for the motion detection sensitivity: High, Medium, Low



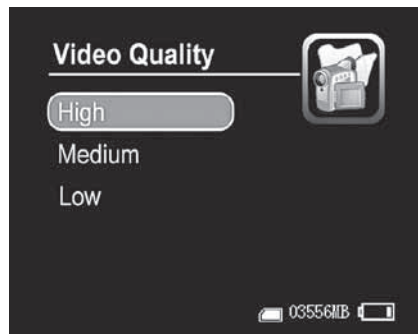
## Resolution



You can select the image size for your photo or video capture:

- D1: 720\*480
- D1: 720\*576
- VGA:680\*480

## Video Quality

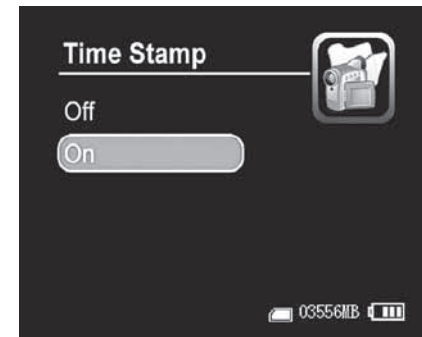


There are three video quality options available for video recording

- High is about 8-9 Mbps
- Medium is about 3.5 Mbps
- Low is about 2.5 Mbps

The video quality should be set to High for best results.

## Timestamp



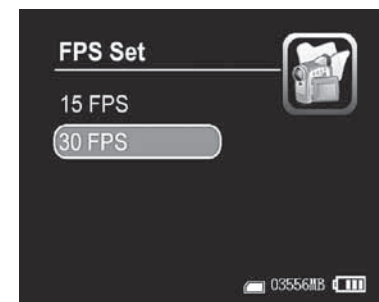
The timestamp will appear on top right of the video image when Timestamp setting is set to On,

## File Length



Sets the maximum time length of recorded files.

## FPS Set



This option is for setting the amount of frames per second when you record video, such as 30 frames per second, 15 frames per second.

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### Audio Record Volume



You can adjust the volume level of the audio input from 1 to 10.  
If noise is present please adjust the volume to a lower value, otherwise select a higher volume for audio recording.

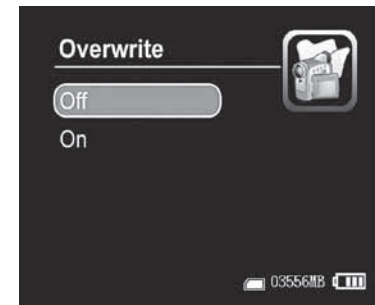
### Microphone Select



Select the built in microphone or external microphone as audio source.

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### Overwrite



If Overwrite is set to **Off** the LCD-DVR will stop recording once the SD Card becomes full.

If Overwrite is set to **On** the LCD-DVR will continue to record by writing over the old files once the SD Card becomes full.

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## System Settings



### Language



English, Simple Chinese and Traditional Chinese languages are currently supported.

### Date and Time



Use the navigation buttons to move the cursor to the date line and enter the correct the YEAR, DAY or MONTH, Next move to the time line and adjust to the correct time for your time zone.

Press the **Select** button to save setting.

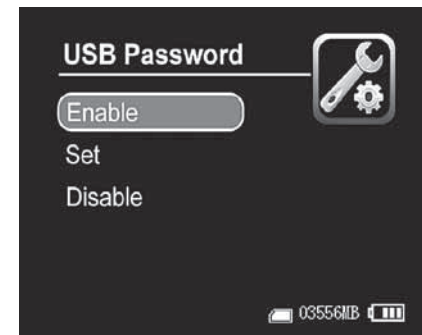
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## Password Protection



You can set or cancel the password protection for USB or format SD Disc or files to prevent deletion without your authorization. The default password is 000000 for all passwords.

### USB Password



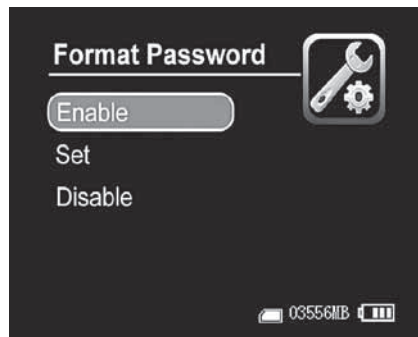
You can set, enable or disable the USB password for accessing the LCD-DVR by USB.

### Delete Password



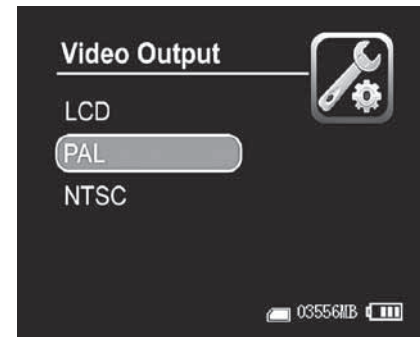
You can set, enable or disable the delete password for deleting the files in the SD Card.


### Format Password



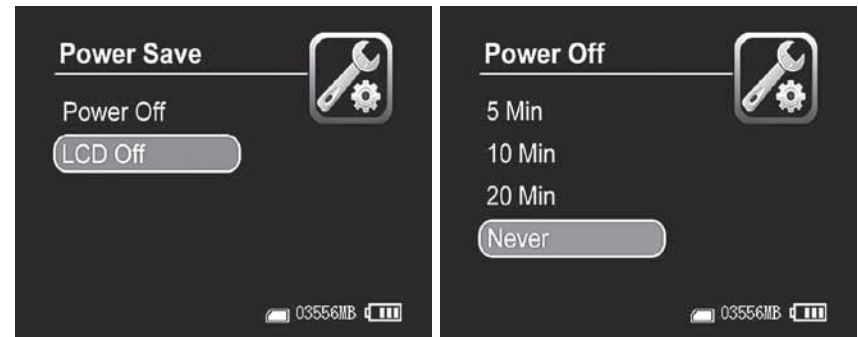
You can set, enable or disable the Format password for formatting the SD Card.

### Video Output



Set the correct TV out format to match TV set (NTSC or PAL).  
It is also possible to cycle between PAL, NTSC and LCD by pressing the LCD/TV button  on the IR remote controller;

### Power Save



In order to save more power:  
You can set the LCD-DVR to turn off the Power automatically after 5 seconds, 10 seconds, 1 minute or never.  
You can set the LCD-DVR to turn off the LCD automatically after 5 minutes, 10 minutes, 20 minutes or never.  
The LCD will be turned back on if you press any key.

### Vibe Alert



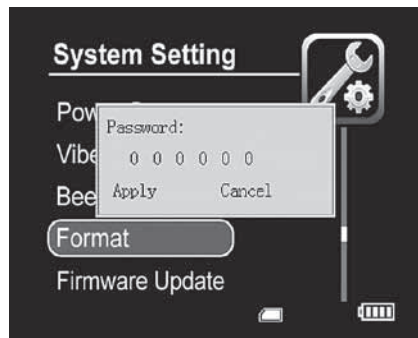
When set to **On**, the LCD-DVR will give a vibration prompt for power on, video loss, SD card invalidation, low power, and power off.

### Beep



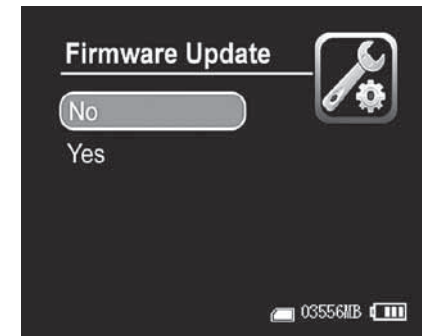
Optionally play a beep sound when pressing buttons.

### Format



You can format the SD card, the default password is 000000.

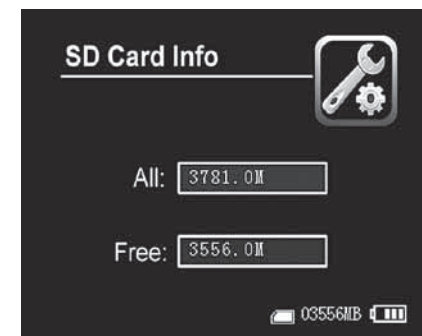
### Firmware Update



Copy the firmware update file to SD card and insert into LCD-DVR.

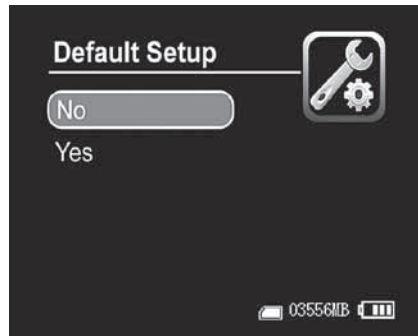
Select Firmware update, then the firmware update dialog block will appear on the screen. When updating it is critical to have enough battery power or connect the AC adapter to AC power outlet and do not operate the LCD-DVR to prevent Firmware update failure.


### SD Card Info



You can check the information on the current SD card.

## Default Setup



You can reset the LCD-DVR to default setting if it is necessary; select YES then press the select button  to reset to default setting;

## Version

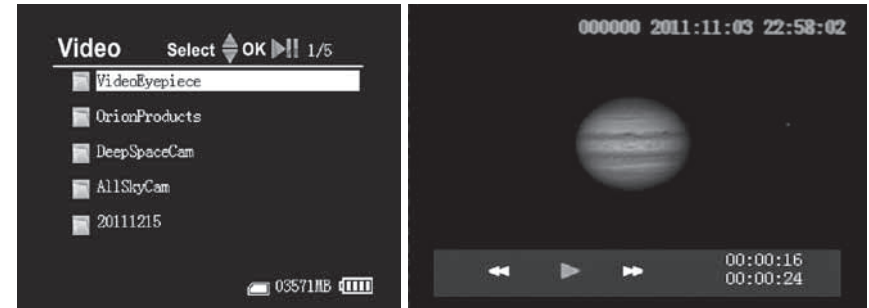


You can check the current Firmware version.

## Event Playback Settings



### Video Playback



Enter Event Playback settings menu and use navigation buttons to select files to playback.

Press and release the up or down keys to adjust the audio volume.




Press and hold the up or down keys to adjust playback speed to values of 1x, 2x, 4x, 8x and 20x.

When files are initially recorded they will named according to the current time and located in directories named according to the current date.

Filenames and directory names can be modified by renaming files on SD Card by connecting with computer via USB or SD-Cart port on computer.


### Browse still photos



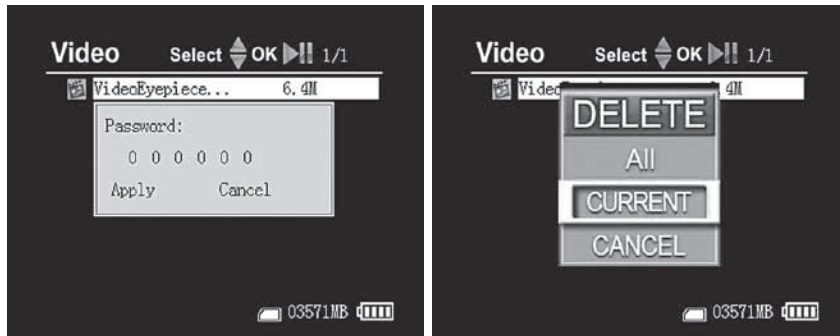
Press the select button  on the image Viewer item to browse the still photos, press the up or down key   to view last or next picture.


### Play back the audio files



Press the select button  on the Voice Player item to play back the audio files.

### Managing recorded files



Move the cursor to select a file and press the Menu Button , the file manager menu will pop up on the screen. You can now delete current file or all files.

## LCD-DVR Specifications

High Resolution LCD:	2.5" TFT true color High Resolution LCD
Recorded Video:	MPEG AVI
Recorded Photo:	JPG
Recorded Audio:	WAV
Video In/Out:	RCA Composite NTSC or PAL
Storage type:	SD card (FAT 32 ,support to 32G)
Video size and speed:	NTSC: 720x480 (D1) @ 30FPS PAL: 720x576 (D1) @ 25FPS
Recording time:	15 minutes~2.5 hours /1G 8 hours~80 hours /32G
Power consumption:	200mA 3.7V 1000 mAH Rechargeable Li-ion battery 5.0V 2A AC Adapter
Size:	90 mm x 59 mm x23 mm
Weight:	100g (including battery)

*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.*

*Changes of 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 output on a circuit different from that to which the receiver is connected.*

*Consult the dealer or an experienced radio/TV technician for help.*

*A shielded cable must be used when connecting a peripheral to the serial ports.*

## **One-Year Limited Warranty**

This Orion StarShoot LCD-DVR is warranted against defects in materials or workmanship for a period of one year from the date of purchase. This warranty is for the benefit of the original retail purchaser only. During this warranty period Orion Telescopes & Binoculars will repair or replace, at Orion's option, any warranted instrument that proves to be defective, provided it is returned postage paid to: Orion Warranty Repair, 89 Hangar Way, Watsonville, CA 95076. If the product is not registered, proof of purchase (such as a copy of the original invoice) is required.

This warranty does not apply if, in Orion's judgment, the instrument has been abused, mishandled, or modified, nor does it apply to normal wear and tear. This warranty gives you specific legal rights, and you may also have other rights, which vary from state to state. For further warranty service information, contact: Customer Service Department, Orion Telescopes & Binoculars, 89 Hangar Way, Watsonville, CA 95076; (800) 676-1343.



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