

StellaCam 3
IS
THREE CAMERAS in
ONE!!!

ASTROVID StellaCam 3

PROPER USE AND CARE OF YOUR ASTROVID StellaCam 3™ ASTRONOMICAL CCD VIDEO IMAGING SYSTEM

Congratulations on the purchase of the **ASTROVID StellaCam™ 3 VIDEO CAMERA!** This is a high quality **Astronomical CCD Video Imaging System for spectacular real time deep sky video images!** With proper care this system should last many years and provide excellent images!

SAFETY PRECAUTIONS:

1. Use **only the power transformer supplied with the camera.** Use of any other power transformer will damage the camera and invalidate the Warranty.
2. A portable 12 volt battery pack can be used if there is a **0.5 (500 milliamp) amp fuse wired in series with the positive lead.** We also found that an excellent way to use the cameras in the field is to use a 110 volt inverter. These



IMAGING SOLUTIONS YOU CAN DEPEND ON

are available from either Wal-Mart or K-mart for less than 50.00.

3. Avoid static electricity discharges. These may damage the CCD chip.

4. **Do not point the CCD towards the Sun or bright light. Permanent damage to the CCD chip will result. If you want to image the Sun you need a good quality solar**

filter.

5. Do not directly touch or attempt to clean the CCD chip.

6. The thread mount on the CCD camera has fine threads. **Do not force it onto the 1.25"-C adapter, T-C adapter, or lens mount.**

7. In our use of the T-C adapter we have found that at times small metal flakes from the T-adapter threads will end up on the protective glass that covers the CCD chip. When using your camera they will show up as irregular opaque black dots on the screen. They can either be blown off using an Air Syringe Bulb available at drugs stores or by using a **very soft** artist's paintbrush to carefully dust them off.

8. Keep the cover on the camera when it is not in use.

9. Treat the ASTROVID StellaCam 3 camera as a fine piece of equipment and it will give you many years of enjoyment.

PLUGGING INTO THE UNIVERSE:

Your results will depend greatly on "seeing conditions" at the time of observation.

1. An T-C or 1.25"-C adaptor is required to attach the video camera to the telescope. A T-C adapter is preferred for attaching the StellaCam 3 to a focal reducer. Or you may use the OPTEC 3.3 focal reducer system that has its own camera adapter.

2. The camera can be attached directly to the 3.3 focal reducer via the T-C adapter or via a 1.25"-C adapter into an eyepiece holder for prime focus videography. Again, the StellaCam III works best on faster F/ratio telescopes.

3. Eyepiece or Barlow enlargement needs to be used on the planets. Deep-Sky images can be done at prime focus or with camera lenses.

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3. The ASTROVID StellaCam 3 video camera has excellent sensitivity to infrared radiation to approximately 1100nm. This increased sensitivity works to your advantage in capturing deep sky objects. If you have an achromatic telescope you may find that correcting the color correction of the telescope using a UV /IR blocking filter will improve star images.

4. This camera is sensitive enough to use as a color imager. Filters. RGB dichroic filters have the highest transmission rates and offer the best solution for color imaging.

5. The StellaCam III has manual controls that will enhance deep sky imaging. The controls include fast shutter speeds, frame accumulation, field integration, gain, gamma (contrast), control via a separate control box.

6. The increased Infrared sensitivity is not a hindrance and may, in fact, be very useful. The increased IR along with longer integration times allow imaging of deep sky objects with the ASTROVID StellaCam 3.

7. The strength of the StellaCam 3 lies in the fact that it is very low in noise, has a very evenly illuminated background, has excellent dynamic range, showing vast amounts of detail in the middle grayscale range. It also produces very pinpoint star images enable this camera to be used for astrometric and photometric work.

8. Deep-Sky video-astronomy should be done at prime focus, via focal reducers, via fast c-mount lenses, and with 35 mm camera lenses. This use of c manual focus camera and c-mount lenses allows you to use the StellaCam 3 as a video finderscope, and is extremely well suited for meteor and wide-field imaging.

The above information is just a guideline to get you started. Because Astrovideography is an unexplored area that does not get much attention, you should take the initiative to experiment with different objects and filters using the ASTROVID camera.

The ASTROVID StellaCam 3 is the most sensitive deep sky video camera ever made for Astronomy!!

We invite your comments and feedback and look forward to exploring this new facet of Amateur Astronomy with you. We will publish images sent to us on our web page. Credit will be given for all items used.

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CAMERA CONNECTIONS:

*****The power supply is to be connected last to prevent any damage to the camera.*****

1. This camera cannot be hooked directly to a television for a picture as it only supplies Baseband or Composite Video.
2. Most newer televisions have separate **Video In** jacks that can be used with this camera.
3. Look at the back of the Astrovid **StellaCam 3** camera.
4. On the back is a 16 pin female jack. The round **male rubber** jack on the black cord going into the ASTROVID **StellaCam** control box attaches to the back of the camera. **DO NOT force this connection . The arrow on the long black cable is placed at the 12 O'clock position and pushed into the camera head. Please attach the cable only in brightly lit conditions so as to prevent damage to the connector on the back of the camera.**
5. Leave the power supply unplugged from the mains 110 volt or 220 volt power supply Plug in the mini-phono plug from the power supply into the power jack on the back lower right of the camera. This jack is labeled power . The center pin is positive. Use only the power supply that came with the camera.
6. Connect the white 25 foot Composite video cable (standard) to the back of the ASTROVID StellaCam3. This is done by lining up the two notches with the pins that protrude on the BNC connector on the back of the camera itself. The cable is then gently pushed onto the connector and twisted.
7. The other end of the white video cable has a **Male RCA Adapter** that can be plugged into a **VIDEO IN** jack for a television, camcorder, or VCR. (please note set VCR or TV to line in or video in)
10. Our monitors come with the same BNC jacks as the camera. So if you are using our monitor you will need 1 BNC to F-adapter. The RG-59 cable can then be screwed into the **VIDEO INPUT JACK** on the monitor. There is another BNC jack on the monitor for **VIDEO OUTPUT**. From here using another cable with a BNC on one end and an RCA adapter on the other end, you can plug into a VCR or Camcorder to simultaneously watch and record your observations. Using this configuration with one of our 900 line high resolution monitors will give the best results from the **ASTROVID StellaCam 3**.
11. **Once all of the cables and adapters are plugged in, you may plug the power supply in to the 110 volt or 220 volt mains power supply.**

**With total manual control
the ASTROVID StellaCam™3
gives the
Best deep- sky images ever!**

NOTES

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ASTROVID StellaCam™ 3 CONTROL BOX

The use of the separate control box and the on-screen display of the camera controls make this camera very easy to use. The outlay of all of the controls also make the AstroVid StellaCam 3 very intuitive to use. The functions of the various buttons on the control box are as follows.

FRAME DIAL - HIGH SPEED SHUTTER MODE (LABELED HIGH)— This is the planetary, lunar and solar imaging mode. The Shutter speeds are labeled HIGH 1,2,3,4,5,6. They correspond to shutter speeds of 1/60, 1/125, 1/500, 1/1000, 1/2000 second. This should cover almost all planetary fast imaging modes.

FRAME ACCUMULATION MODE (LABELED SLOW) - This dial is the setting used to accumulate frames within the camera. The box is labeled OFF (1/60 second mode), 1,2,4,8,16,32,64,128,256. These are the number of frames accumulated. It related to exposure times for the cameras. There is a chart on the reverse of the control box giving the exposure times for EIA (US Standard) and CCIR (PAL or overseas standard).

UNLIMITED INTEGRATION TIME MODE (LABELED START / STOP) - ***Use this mode only for deep sky objects, do not over expose in this mode as so not to damage the CCD chip.*** This is the mode for very deep imaging of deep sky targets. This mode is quite easy to use. Turn the top dial to the position with the arrow for the Start / Stop position. To start the image press the red start button. It will lock in a depressed mode. During the time it is locked in place the camera will be exposing. To end the exposure press the red button again. The image will now appear on the screen. The image will stay in place as you start another exposure and for the duration of that exposure. Your new image will appear when the stop is pressed again.

GAIN DIAL - CAMERA GAIN CONTROL - The gain control acts to boost the strength of video signal. It can be used to bring out faint detail by increasing the gain by going from LO (0dB) to HI Gain (38dB). As it can introduce noise you want to keep the gain as low as possible. For most deep sky objects you will not need to increase the gain beyond the mid-level setting.

IRIS - IRIS SLIDER - This allows the user to mount an auto-iris lens. This is a type of lens that opens and closes in response to light level changes. It will keep the lens iris open in dark conditions and close the lens iris down in light conditions. There are two types of auto iris lenses VIDEO and DC. The StellaCam III can use both types as the camera will switch to the proper type automatically.

FREEZE INDICATOR - The red led will light when the picture on the screen is frozen. It can be used in any frame dial mode.

READ-OUT INDICATOR— The green led will light is synchronous with the readout timing of the CCD.

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GAMMA— Gamma relates to contrast of the image. There are three GAMMA settings, OFF gamma 1.0, LO gamma = 0.45 , HI Gamma 0.35. Most of the time, the OFF and LO gamma settings will be the only ones you will need to use. Increasing the gamma , will increase the contrast in fine detail. If the gamma becomes too high you will start to lose fine detail.

FOCAL REDUCERS

It is recommend the you use as fast an optical system as possible. However, in the Start / Stop Unlimited integration mode you can shoot a higher F/ratios. I.e. Bright Small Deep Sky objects such as the Blue Snowball planetary nebula. Schmidt Cassegrain telescopes are the most popular amateur optical systems. The use of a .33X focal reducer either OPTEC or Meade will enable the SCT user to get the best possible images from the StellaCam II. The .33X focal reducers cannot be used optically but are the preferred system for wide field astronomical imaging.

A F6.3 focal reducer, either Celestron or Meade can be used but you will not give the optimal performance that an F/3.3 focal reducer will give. Again, feel free to use the 6.3 focal reducer for brighter objects. You will be impressed how sensitive the unlimited exposure mode is.

With a Refractor you may be able to use instrument dedicated focal reducers or the SBIG E-Finder /FR237 in you have enough inward focus travel. The FR237 / E Finder focal reducer from SBIG will also work on SCT's.

Secondary Lens Assemblies- Hyperstar and FASTAR:An even wider field of view can be obtained using two systems that replace the secondary mirror (Front End Mirror) on the telescope. They are the Hyperstar from Starizona www.starizona.com/hyperstar/ and the FASTAR from Celestron. We highly recommend the Starizona Hyperstar system

HOW TO USE THE STELLACAM 3 Deep Sky – Frame Accumulation Mode (StellaCam II Mode)

1. Connect all connections to the camera, plug in the power supply as described on page three. Attach the camera to a monitor or television.
2. Attach the camera to the telescope via either the focal reducer or 1.25 inch adapter.
3. Start by making the following adjustments on the control box. **A.** Frame accumulation set to OFF , 1 or 2. **B.** Turn the gain up to mid range **C.** Set Gamma to LO
4. Go to a star field and and focus on a fairly bright magnitude 1 to 4 star. If you use the frame rate of 0,1, or 2 you will be able to focus in real time or almost real time.
5. Once in focus you can increase the frame rate to 256. The gain to the mid setting and gamma to LO. You should see stars in the background now.
6. Next , go to a deep sky object . A brighter deep sky object is good to start with. I.e. Orion Nebula, Andromeda Galaxy, Dumbbell Nebula, or Ring Nebula.
7. Once at the deep sky object make the following adjustments to the control box. **A.** FRAME DIAL 256 Frame accumulation **B.** GAIN—Mid Level Setting (12 O'clock Position) **C.** Gamma LO
8. Once you get an image on screen that you really like you may freeze the frame. This will keep the image on the screen. To Freeze the frame press the Red button on the side of the control box in. To go back to the real time video image press the Red FREEZE Frame button again.
9. Gain adjustments can be made to bring out fainter detail by increasing the gain. Contrast enhancements can also be made to enhance faint details.

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StellaCam 3 UNLIMITED INTEGRATION MODE (Labeled START / STOP) - Use this mode only for deep sky objects, do not over expose in this mode as so not to damage the CCD chip.

1. Connect all connections to the camera, plug in the power supply as described on page three. Attach the camera to a monitor or television.
2. Attach the camera to the telescope via either the focal reducer or 1.25 inch adapter.
3. Start by making the following adjustments on the control box. **A.** Frame accumulation set to OFF , 1 or 2. **B.** Turn the gain up to mid range **C.** Set Gamma to LO
4. Go to a star field and focus on a fairly bright magnitude 1 to 4 star. If you use the frame rate of 0,1, or 2 you will be able to focus in real time or almost real time.
5. Once in focus you can increase the frame rate to 256. The gain to the mid setting and gamma to LO. You should see stars in the background now.
6. Next , go to a deep sky object . A brighter deep sky object is good to start with. I.e. Orion Nebula, Andromeda Galaxy, Dumbbell Nebula, or Ring Nebula.
7. Once at the deep sky object make the following adjustments to the control box. **A.** FRAME DIAL 256 Frame accumulation **B.** GAIN—Mid Level Setting (12 O'clock Position) **C.** Gamma LO
8. Once you get an image on screen that you really like you may freeze the frame. Do a test exposure to make sure you have the deep sky object in your field of view. If you are going for really faint objects they may not appear in this mode
9. Turn the top dial to the position with the arrow for the Start / Stop position.
10. To start the image press the red start button. It will lock in a depressed mode. During the time it is locked in place the camera will be exposing. We found that exposures of one minute are excellent at picking up a large amount of deep sky information.
11. To end the exposure press the red button again. The image will now appear on the screen.
12. The image will stay in place as you start another exposure and for the duration of that exposure. Your new image will appear when the stop is pressed again

PLANETARY IMAGING MODE (Labeled HIGH)

1. Connect all connections to the camera, plug in the power supply as described on page three. Attach the camera to a monitor or television.
2. Attach the camera to the telescope via 1.25 inch adapter. A Barlow lens is recommended to increase magnification. We recommend TeleVue Barlow's. For full lunar or solar disk imaging we recommend the ATIK 0.5X focal reducer. This fits right on the end of the 1.25 inch adapter for the camera.
3. To begin your planetary imaging look at the control box. The top dial is the Frame Dial. You will use the positions 1-6 on the top dial labeled HIGH. This is the high speed shutter mode.- This is the planetary, lunar and solar imaging mode. The Shutter speeds are labeled HIGH 1,2,3,4,5,6. They correspond to shutter speeds of 1/60, 1/125, 1/500, 1/1000, 1/2000 second. This should cover almost all planetary fast imaging modes.
4. You want to set the shutter speed to the fastest shutter speed that will still give you a bright on-screen image.
5. You will also use the dial label Gain. Start with the gain in mid-position. There is a position mark LO and a Position marked Hi. LO corresponds to the lowest gain setting and HI corresponds to the highest gain setting. The goal is to keep the gain as low as possible with the fastest shutter speed possible. This will keep your planetary images noise free.

