CDS-1100D, CDS-600D
User Guide

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CentralDS
Cooled DSLR & Custom Optics

Contents

Thank you for purchasing a CentralDS product.

Introduction

CDS-600D and CDS-1100D are modified Canon EOS 600D and 1100D. You can control the camera and take images by using a PC connected to the camera with a USB cable. The image sensor can be cooled maximum -28C below ambient by the installed TEC cooling module to minimize noise of pictures and movies. You will be able to take astronomical images of breathtaking quality.

Camera usages

You can control the camera only by using a PC connected to the camera with a USB cable. You can take pictures, change settings and save images to the PC by this method. You cannot control the camera without a PC connected to the camera. You will get used to this camera and understand the camera better while reading this manual and taking test images. Please read 'Handling caution' and 'Safety of the user and the camera' thoroughly to prevent any accidents or damages to the camera.

Package contents

Please check following devices and accessories are all included in the package. If anything is missing, please contact CentralDS or the dealer that you purchased from.

- Camera with 2" nose piece and dust cap
- USB cable
- 12V 5A power adapter
- DC power extension cable
- EOS Digital solution disk CD-ROM
- EOS camera Manual CD-ROM
- BackyardEOS voucher code

1. 12V 5A power adapter includes a power cable.
2. Please check a lens adapter is included if you purchased one.
3. Please make sure you don't lose any of the contents.

Camera operation and responsibility

We provide a SD memory card to save images with the camera. CentralDS will not be responsible for any inconvenience or loss due to failure of storing images to the SD card or defective images stored in the card.

You can use this camera for personal use anywhere in the world.

Handling precaution

- This camera is a high precision device. Please do not drop and avoid any physical impact against camera.

- This camera is not waterproof. If you drop the camera in water, wipe off any water droplets from the camera with a dry cloth and contact CentralDS.

- Do not leave the camera under the direct sunlight. High temperature can damage the camera.

- This camera is tightly sealed with molecular sieve, high performance desiccant to prevent dew from forming inside the camera while the cooling system is operating. If the camera is disassembled by the user, moisture can get into the camera. This can result in condensation inside the camera and damages of the circuit. Do not disassemble the camera.

- Please use a dust blower to remove dusts on the filter.

- Do not disassemble the filter. If the airtight sealing is damaged, dew can form inside the camera.
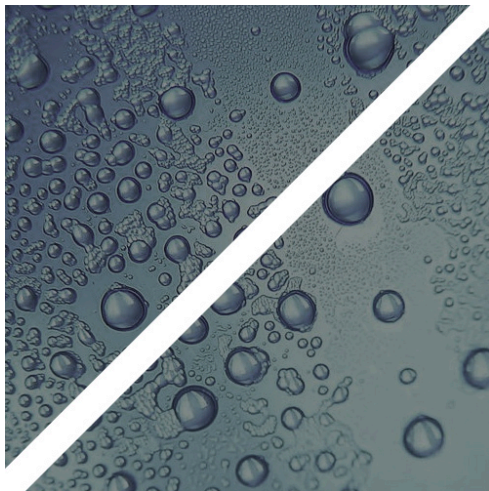
- If the camera is disassembled by personnel not authorized by CentralDS, the warranty will be voided.

- Do not leave the camera attached to a telescope with the cooling system off for long time. Dew can form on the surface of the camera and this can damage the camera.

- If condensation forms on the camera, do not use the camera.

- If the camera is suddenly brought in from the cold into a warm room, condensation may form on the camera and internal parts. To prevent condensation, first put the camera in a sealed plastic bag and let it adjust to the warmer temperature before taking it out of the bag.

- Store the camera in a sealed container with desiccants (i.e. Silica gel) or cool, dry, well ventilated location.

- Image sensor dust – CentralDS tests each camera with test exposures to check the image sensor is dust free before shipping. However about 2 – 4 % of the customer reported dusts on the image sensor. If you see marks on your image due to the dusts on the image sensor, please contact CentralDS for servicing. Do not disassemble the camera to clean the dusts.

- Caution with the cooling system activated – the TEC cooling system for the image sensor is designed to emit substantial amounts of heat to outside. This does not cause any problem on the camera operation but a minor burn can be caused if skin is contacted with the cooling system for extended period time.

Nomenclature

- The camera is in the movie mode with the mode switch pressed / in the manual mode with the mode switch released.
- You cannot use any other MODEs such as Av/Tv/P modes available for unmodified EOS 1100D and 600D.

Before start using

Installing BackyardEOS

1. Keep the BackyardEOS voucher number included with the camera handy.

2. Go to www.backyardeos.com

3. MENU 〉 30-day trial 〉 fill out name, email address and camera model (CDS-1100D, CDS-600D)

4. Fill out the comment section with the provided BackyardEOS voucher number.

5. You should receive an email with an activation key from BackyardEOS.com.

6. Download the latest BackyardEOS from MENU〉DOWNLOAD

7. Install the software and enter the activation key to finish the installation.

Installing Canon EOS Software

· You can control basic camera settings and take pictures and movies with a PC connected to the camera using EOS utility.

· The CD-ROM provided with the camera includes EOS utility, Digital Photo Professional, Zoom Browser EX and Picture Style Editor.

· Do not connect the camera to the PC before installing the software.

· Please install the new software by following instruction even though the previous version of the software is already installed on the PC. The new version will overwrite the previous version.

1. Load the EOS digital solution disk into the CD-Rom drive without the PC connected to the camera.

2. Click Easy installation in the installation guide screen.

3. Click Restart after the installation completes and remove the CD-Rom after the PC is rebooted.

Reading software manual

BackyardEOS

1. Go to www.backyardeos.com

2. MENU 〉 Click MENU 〉 DOWNLOAD 〉 BackyardEOS 〉 Production Release 〉 BackyardEOS.x.x.x zip package and download the file.

3. Extract the ZIP file and store the BackyardEOS User Guide.pdf separately.

4. Open BackyardEOS User Guide.pdf with Adobe Acrobat Reader.
   * You can download Adobe Reader from the internet for free.

EOS Utility

1. Load 〔EOS DIGITAL Software INSTRUCTION MANUAL〕 CD-Rom into the CD-Rom drive.

2. Double click the CD-Rom icon

3. Copy the EOS Utility manual, EUx.xW_E_xx file from 〔English〕 folder to a spate folder in the PC.

4. Open EUx.xW_E_xx file with Adobe Acrobat Reader.
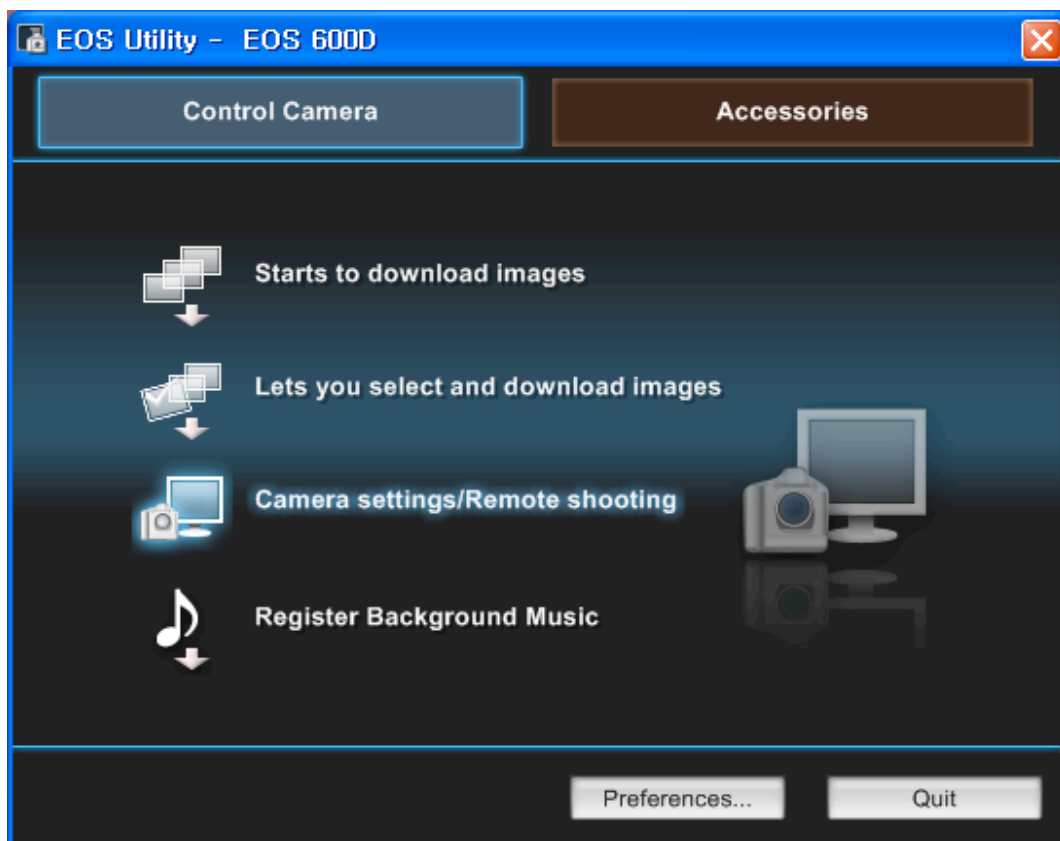
Taking Pictures

· Please make sure EOS Utility and BackyardEOS are already installed on the PC which will be connected to the camera first. You can operate the camera with the following instruction. Please follow the order of the instruction.

1. Turn off the camera on/off switch and the cooler on/off switch on the backside of the camera.

2. Connect the 2" nosepiece (or the camera lens adapter) to the camera body.

3. Connect the camera to a telescope (or a camera lens) securely.

4. Connect the USB cable to the camera USB port.

5. Connect the DC cable to the camera's power port.

6. Please make sure you route the USB cable and the DC power cable through the cable holder to ensure reliable communication between the camera and the PC and prevent any damages on the USB port by any loose connection.

7. Connect the power cable to the power adapter.

8. Turn on the PC with EOS Utility and BackyardEOS installed to control the camera remotely.

9. Once the PC is started, plug in the USB cable from the camera into the PC and turn on the camera.

10. Check the LED light on the camera is on. If the green LED is on, the camera is being powered properly.

11. Run EOS Utility from the PC.

12. Take some test pictures after clicking Camera Settings / Remote Shooting.

    *Please refer to the EOS Utility instruction manual in the 〔EOS DIGITAL Software INSTRUCTION MANUAL〕 for detailed usage of the software.

13. If test photos were not taken properly, please turn off the camera and check the USB cable connection. Then turn on the camera again and take another test picture.

14. If you successfully took a picture, turn on the cooler (move the switch to the left) to start TEC cooling. If the red LED is on, the cooling module is being powered properly.

15. Check if the cooling fan for the heat sink is operating properly

16. The camera reaches the maximum cooling temperature about 7 minutes and 30 seconds after the cooling module is turned on. At that moment the image sensor temperature will be around -26 ~ -30C below ambient temperature (spring and fall). It is not possible to check image sensor temperature with the naked eye.

* The TEC cooling module is more efficient when the temperature is high but the efficiency is lower when the temperature is low in the winter. This is due to the electricity consumption per temperature characteristics of the Peltier elements which is one of the most important parts in the TEC cooling module. As a result, the cooled image sensor temperature may not reach -26C ~ -30C below ambient in the winter.

* The image sensor temperature in BackyardEOS is not the actual sensor temperature but the temperature at the temperature sensor installed on the PCB circuit board placed 2mm behind the sensor. Only the image sensor is directly cooled with a cold finger in the CDS-1100D and the CDS-600D. We found out from experiments that the actual image sensor temperature is around 8C below the temperature that BackyardEOS is displaying (from Canon exif data). It means that the actual cooled image sensor temperature is around -34C ~ -38C (spring and fall).

*We do not provide any software or hardware for users to control cooling temperature.

17. Run the BackyardEOS program.

18. Close EOS Utility and click the connect button on the top left corner of BackyardEOS. This will connect BackyardEOS and the camera.
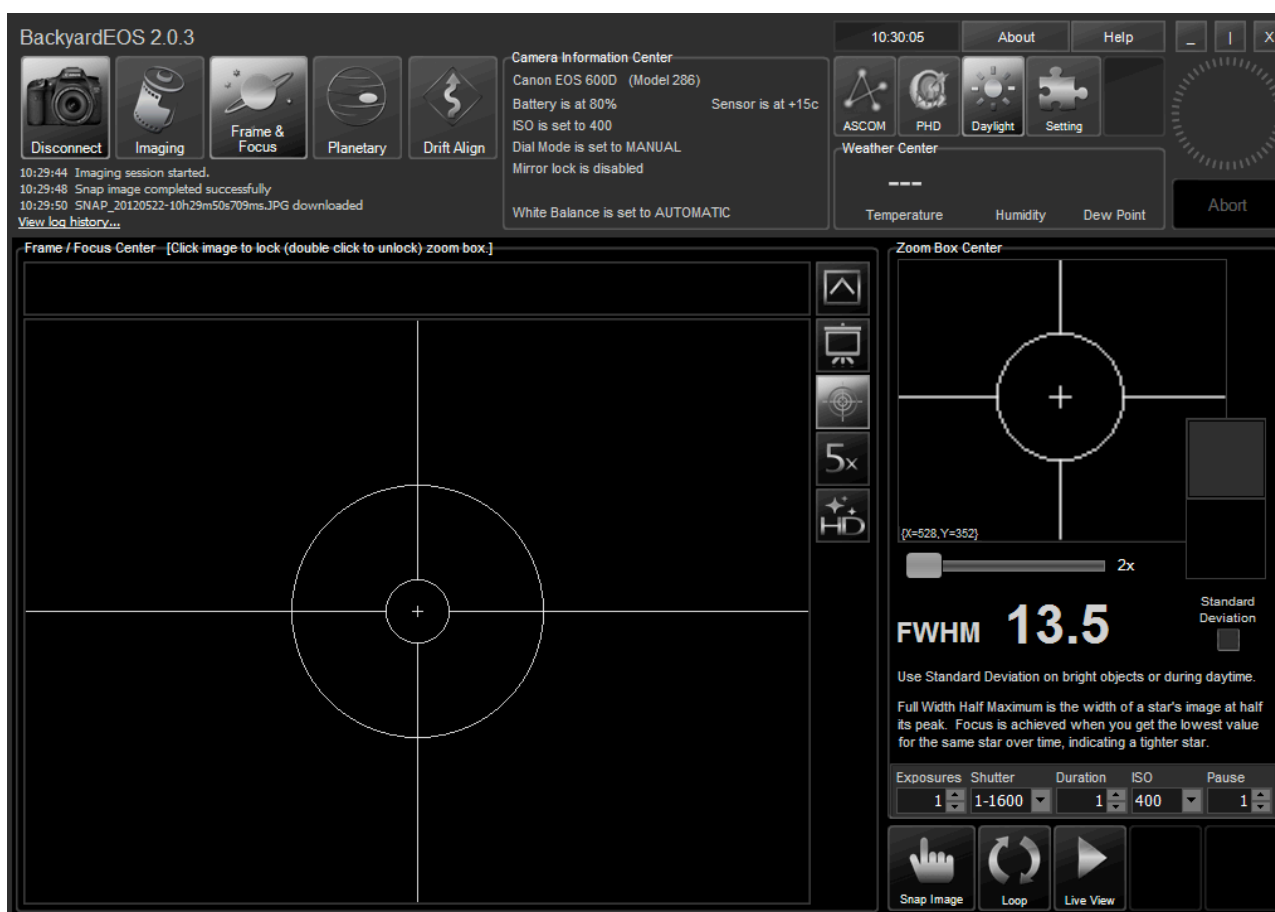
19. After the camera is connected to BackyardEOS, click Frame & Focus button at the center of the button tool bar on the top left part of the program.

20. You can check the image sensor temperature at the camera information section on the top center area of the program.

* Please refer to the <u>BackyardEOS User Guide.pdf</u> for detailed usage of BackyardEOS.

21. Close BackyardEOS, turn off the cooler and turn off the camera after finishing an imaging session.

22. Disconnect the USB cable and the power cable from the camera.

23. Remove the camera from the telescope (or the camera lens).

24. Put the nosepiece cap (or lens cap) on and put the camera in a case with desiccants (i.e. Silica gel).

* If the camera is exposed to the air outside with the cooling module off for extended period of time, the camera can be internally damaged due to problems such as short circuits caused by condensation.

* If you have to leave the camera outside for extended period of time, cover the camera with the dew shield cover as soon as turning off the cooler.

Characteristics of the modified camera

- CDS-1100D and CDS-600D are modified versions of Canon's general purpose DSLR cameras. Some of original features of the Canon camera are removed and new features such as TEC cooling and general purpose filter mounting are added for high quality astrophotography. Followings are the differences made by the modification.

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1. The low pass filter attached to the image sensor is removed and a MC coated Hoya clear filter transmitting visible light and infrared light is mounted.

   *this filter can be replaced with Baader 2" UV/IR blocking astrophotography filter when you order.

2. Because the low pass filter is removed, image blurring can occur due to chromatic aberration on the infrared lights recorded on the sensor so the image sharpness can suffer. This is more pronounced in the images taken with refraction optics than reflection optics.

3. We recommend you use UV/IR cut filter, light pollution filter and deep sky filter at the same time while imaging.

4. You are able to do infrared photography by mounting a visible light blocking / infrared transmitting filter such as a Hoya R72 filter.

5. Various 2" imaging filters can be mounted in the 48mm filter holder in front of the clear filter (or Baader UV/IR filter) when a camera lens is used. The lens should be mounted after the 2" filter is mounted.

6. When a telescope is used for imaging, 2" filters can be mounted in the 48mm filter holder in front of the 2" nosepiece.

7. The lens mount does not have the communication point so the auto focus, lens information recording and pulse signal transfer for ultrasonic motor operation which are based on the communication between the camera body and the lens are disabled even when a Canon lens is used.

8. You always have to focus lenses manually. Some lenses (200mm F1.8L) need power from the body for manual focusing and you cannot focus these lenses even manually when they are mounted on CDS-600D and CDS-1100D.

9. You cannot update CDS-1100D and CDS-600D with the firmware provided by Canon.

10. No other camera settings can be changed other than the settings that can be changed from the preferences menu in EOS Utility.

Safety of the User and the Camera

Follow these safeguards and use the equipment properly to prevent injury and equipment damage.

1. Do not leave the power adapter and the power cord near an object emitting heat. This can cause fire due to deformation and damage of the insulator.

2. Do not use the camera near inflammable gas.

3. If the internal parts of the camera are exposed after the camera is dropped or the camera housing is damaged, do not connect the power to the camera due to danger of an electric shock.

4. Do not disassemble the camera. It can cause an electric shock.

5. Keep the camera from the reach of small children.

6. Do not use the equipment in dusty or humid places. This is to prevent fire and electrical shock.

7. Do not use the camera with medical equipments. The electromagnetic interference can cause malfunction of the medical equipments.

8. To prevent fire and electrical shock, follow the safeguards below:

   - Always insert the power plug all the way in.

   - Do not handle a power plug with wet hands.

   - Do not excessively bend the cord.

   - Do not put a heavy object on the power adapter and cord.

   - Do not connect too many power plugs to the same power outlet.

   - Do not use a cord whose insulation has been damaged.

   - If the surrounding near the power outlet is dusty or humid, the power outlet can be short circuited. Clean and dry the surrounding before using the equipment.

   - Do not use the camera inside a car under the hot sun, under the direct sun light or near a heat source. The camera can be damaged or causes skin burns.

   - Do not use paint thinner, benzene, acetone or other organic solvents to clean the equipment. Doing so may cause fire or a health hazard.

Product Warranty

CentralDS Provides 1 year product warranty for customers who purchases CDS-1100D and CDS-600D. If a customer provides his or her own camera to be modified by CentralDS, CentralDS offers 60 days product warranty.

CentralDS

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http://www.centralds.net
Email support@centralds.net
phone: +82-42-321-5862 fax:+82-42-253-5065

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