CELESTRON

LCD Digital **Microscope II**

INSTRUCTION MANUAL
MODEL #44341

ENGLISH

INTRODUCTION

Thank you for purchasing the Celestron LCD Digital Microscope with a 3.5" monitor. Your microscope is a precision optical instrument, made of the highest quality materials to ensure durability and long life. It is designed to give you a lifetime of enjoyment with a minimal amount of maintenance.

Before attempting to use your microscope, please read through the instructions to familiarize yourself with the functions and operations to maximize your enjoyment and usage. See the microscope diagrams to locate the parts discussed in this manual. If you run into any problems, see the trouble shooting section later in this manual.

This microscope provides high powers from 40x up to 400x (up to 1600x with digital zoom), ideally suited for examining specimen slides of all kinds. You will view specimens or objects on the LCD Monitor, versus eyepieces found on traditional microscopes. With the LCD Monitor, specimens or objects are easy to see, and can be viewed by multiple people at one time. You can also take snapshots or short videos with the built in digital camera. The LCD Digital Microscope has a built in digital camera, so you can take snapshots and/or short videos of the specimens or objects you are viewing.

Fig. 1

Features

5MP Digital Camera built in	Filter Wheel–built-in 6 position
3.5" Color LCD Screen	AC Adapter
4x Objective Lens	USB Cable
10x Objective Lens	5 Prepared Slides
40x Objective Lens	Dust Cover
Adjustable Top and Bottom Illuminators	Carrying Case
1G SD card	

Specifications

Model #44341

Stage Mechanical Stage	3.5" x 3.5" (88 mm x 88 mm)
Digital Camera	5 MP CMOS; 10x Magnification in lieu of an eyepiece; 3072 x 1728 pixel array
LCD Monitor	3.5" with 4x Digital Zoom – High definition digital TFT display Resolution – 320 x 240 pixels, Contrast ratio – 350, Color Support – 262K colors, Brightness/Luminance – 400cd/m2
Focuser	Smooth, single motion
Memory	SD card slot, supports up to 32G card - 1G SD card included (625 snapshots at 5MP, 20 minutes of SD video)
USB Cable	1.5m long, 2.0 USB
Filter Wheel	6 Position- Red, Blue, Green and 1, 3, 6 mm DIA aperature
Nosepiece	3 Position with click stop
Illuminators	Built in adjustable LED- DC 5V, 2W?3W
Condenser	N.A. 0.65
AC Adapter	Input Universal 100 to 240Volt 50/60HZ
Weight/Dimensions	56.44 oz. / 1600 g
Batteries	4AA (User supplied- up to 3 hours of use)

Magnification Table

Use the following table to determine the magnification power combinations you can achieve with the LCD Digital Microscope II.

Objective Lens	**4x**	**10x**	**40x**
Magnification of image on screen	40x	100x	400x
Maximum, using 4x digital zoom feature	160x	400x	1600x

SETUP YOUR MICROSCOPE

1. Remove the carrying case from the shipping box.
2. Unzip the case, and carefully remove the microscope and other parts and set them on a flat surface.
3. Insert the cylindrical plug on the end of the AC adapter into the socket on the back of the microscope and then connect the plug end of the AC adapter into a proper power outlet as shown in Figure 2.

***Note**: The AC Adapter's plug is interchangeable for use around the world. Switch easily from USA, UK or EU style plug.*

A. To change the plug, push down and hold the small button release. (Circled in Figure 3). Grasp the plug prongs with your free hand and rotate the plug head counter clockwise 90° to release. Reverse the procedure with your chosen plug head. When the new plug head is secured in placed, you will hear a 'click' sound.

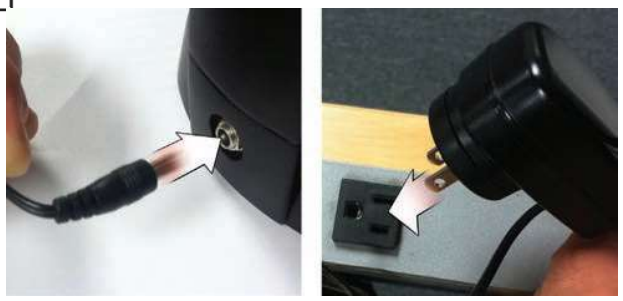


Fig. 2

Fig. 3

BATTERY OPERATION — You can use your microscope without AC power if you choose. This gives you the freedom to operate the microscope outdoors or indoors anywhere you please. You'll need 4 AA batteries (user supplied). Open the battery door on the bottom of the microscope and insert the batteries according to the battery polarity shown in the battery compartment (Figure 4). After the batteries are installed, close the battery door. Battery life will typically be three hours.

USING YOUR MICROSCOPE

Turn the microscope on by pressing and holding the POWER button on back of the LCD housing, as shown in Figure 4. Once the Celestron logo appears, you can release the POWER button.

Fig. 4

LCD Monitor

The LCD Monitor of your digital microscope replaces the traditional eyepiece, enhancing the user experience. Whatever you are observing is displayed on the LCD screen which means easier viewing. It also reduces eye strain and allows multiple people to view what is displayed.

The interface is simple. There are 3 main buttons (as shown in figure 5 below):

MENU button
- Press and hold to access the settings menu
- Press once to switch between camera and video mode
- When in SETTINGS menu, it becomes the BACK button

SELECT button
- Select when in the SETTINGS menu
- TRIGGER snapshots
- START and STOP video

NAVIGATION buttons
- Arrow UP button
- Arrow DOWN button
- From MAIN window: DIGITAL ZOOM control

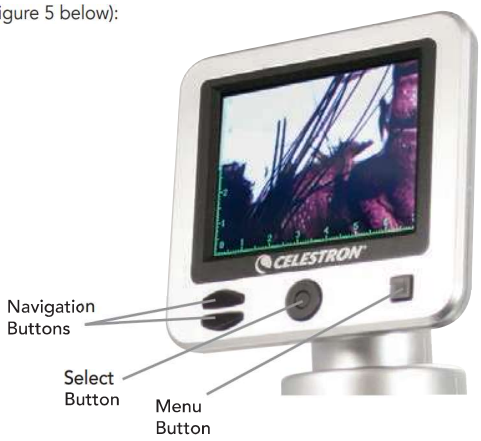


Fig. 5

ILLUMINATION

Proper illumination is key to ensure a quality image.

Your digital microscope is equipped both a TOP and BOTTOM adjustable illuminator. Each illuminator has an adjustment wheel located on either side of the base (see Figure 6).

The LCD Digital Microscope II is designed to work with specimens on slides. You will use the BOTTOM illuminator the most. It works by shining light up through the hole in the stage and through a specimen slide.

The TOP illuminator can be used with the BOTTOM illuminator when a slide specimen is thicker than normal. The lowest power for the LCD Digital Microscope II is 40x. Although it is not ideal, 40x can be used for viewing 3D objects, like coins or paper.

Fig. 6

Digital Light Adjustment

The LCD Digital Microscope adjusts to the light digitally through the EV (Exposure Value) adjustment, similar to a digital camera.

Press and hold the MENU button to access the SETTINGS menu. Scroll to the EXPOSURE tab and press SELECT. In the EXPOSURE window, adjust the EXPOSURE UP (brighter) or DOWN (darker) using the NAVIGATION buttons. (see Figure 7)

Tip: *Viewing a specimen that is very dark in color decreases the amount of light that can shine through it from the BOTTOM illuminator. To correct this, you will need to increase the exposure setting by switching the illuminators to their highest setting.*

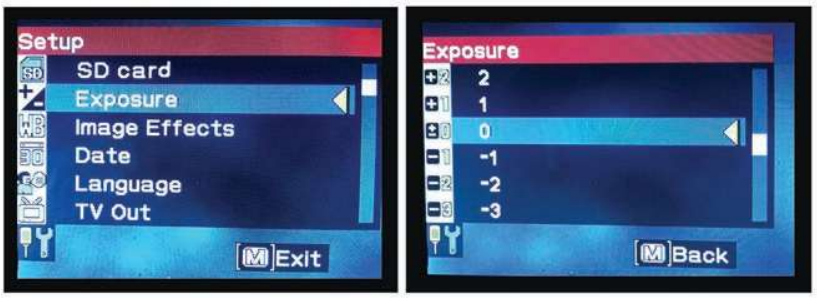


Fig. 7

Viewing a Specimen

Your digital microscope is equipped with a mechanical stage with adjustment knobs and a self adjusting lever-action holding clamp. (see Figure 8 below)

1. Use the thumb arm on the self adjusting lever action holding clamp to open the clamp.
2. Place a specimen slide (3" x 1" / 76.2 x 25.4 mm size) inside the holder and release the clamping arm, securing the slide in place.
3. Use the stage adjustment knobs to position the specimen over the opening in the stage. The rear stage adjustment knob moves the X axis (forward and backward) whereas the front stage adjustment knob moves the Y axis (side to side).

Note*: A vernier scale on both axes allows the exact marking and replication of an object in the field of view.*

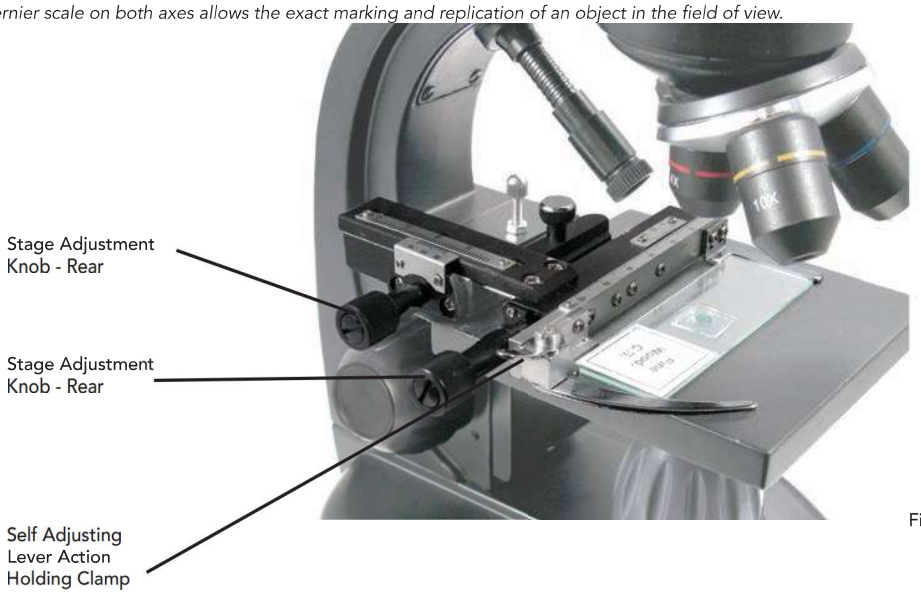


Fig. 8

4. Use the objective nosepiece (13) to rotate the objective lenses (12) until the 4x objective lens is directly over the specimen and clicks into place. Always start with the lowest power objective (4x with this microscope) which gives you 40x power and work your way up to higher powers. At 40x power you will have the widest field of view and the brightest image.
5. Look at the LCD screen while turning the focus knob (7) until the specimen comes into view. You may need to adjust the stage adjustment knobs (See Figure 8 above) to center the specimen.
6. With the 4x objective lens, you can vary the power anywhere from 40x to 160x by using the digital zoom. To do this, use the Navigation Buttons on the LCD. Press UP once and the zoom will adjust to 2x. Each additional press of the button will adjust the zoom by 1x, until it is at 4x. If you press UP again from 4x, it will go back to 1x. Press DOWN (from 1x) and the zoom will adjust to 4x, then 3x, 2x and back to 1x.
7. To view in higher powers, rotate the objective nosepiece to the 10x or 40x objective. You will need to refocus after this change.

***Tip**: When changing objective lenses, lower the stage to ensure there is no contact between any objective lens and the stage surface which may result damage.*

Using Filters

To change the filter settings, you rotate the filter wheel. (see Figure 9 below)

The filter wheel choices are as follows: Color: Red, Green, Blue - Clear: 1 mm, 3 mm and 6 mm apertures. Color filters work well with bright transparent specimens. The different diameter apertures (1 mm, 3 mm, 6 mm) can help focus light on a section of a specimen, providing a more detailed image.

Fig. 9

DIGITAL IMAGING

The LCD Digital Microscope II allows you to take snapshots and take short video clips, without the need to connect to a PC.
***Note:** Do NOT connect your microscope via USB while shooting images as doing so may cause damage to your microscope and/or computer.*

The included 1G SD card allows for saving up to 625 still images (at highest resolution) or 20 minutes of video.

Settings

Adjusting the settings is a good idea before recording images with your LCD Microscope. Take note of your current settings by looking a the main screen. There are a few icons on the screen that give you some valuable information. They are as follows (and as shown in Figure 10.):

A. MODE: Video or Still Image

B. DIGITAL FILTER SETTING: The icon shown AWB denotes "No Filter" or Normal Setting.
Other icons are Monochrome , Magenta , Blue , and Green

C. Images remaining on memory

D. SD CARD ICON: SD Shows card is present

E. IMAGE SIZE: Based on the pixel ratio

F. MEASURING RETICLE: If you see the measuring reticle, that means that feature is turned on

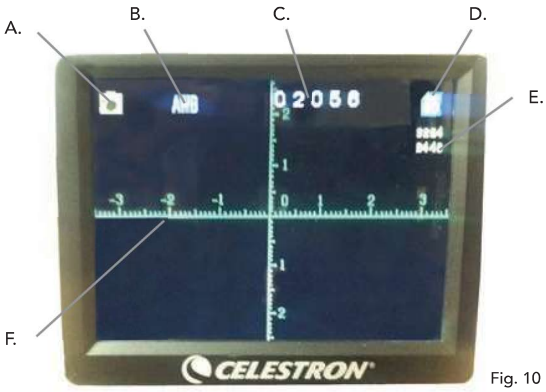


Fig. 10

To change the settings, press and hold the MENU button.
Here's the breakdown of the Settings menu:

1. SD CARD: Select this menu item to format the SD card or View Images on the SD card

2. EXPOSURE: Select this menu item to change the EV settings

3. IMAGE EFFECTS: Select this menu item to choose between digital filters:

AWB Normal mode-no filter
Monochrome
Magenta
Blue
Green

4. DATE: Select this menu item to set the Date and Time and to have the time stamp show up in the video or still image

5. LANGUAGE: Select this menu item to choose between 11 languages for the user interface. Choose between, English, Traditional Chinese, Simple Chinese, German, Spanish, Portuguese, Italian, French, Japanese, Korean and Russian

6. TV OUT: Choose between the standards NTSC and PAL settings:
   • **NTSC** (**National Television System Committee)** is used in Canada, Chile, Costa Rica, Cuba, Dominican Republic, Ecuador, Japan, Mexico Nicaragua, Panama, Peru, Philippines, Puerto Rico, South Korea, Taiwan and U.S.A.
   • **PAL** (**Phase Alternating Line)** is used in Afghanistan, Algeria, Argentina, Austria, Australia, Bangladesh, Belgium, Brazil, Bulgaria, China, Denmark, Finland, Germany, Hong Kong, Iceland, India, Indonesia, Iraq, Ireland, Israel, Italy, Jordan, Kenya, Kuwait, Liberia, Malaysia, Netherlands, Nigeria, Norway, New Guinea, Pakistan, Singapore, South Africa, South W. Africa, Sudan, Sweden, Switzerland, Thailand, Turkey, Uganda, United Kingdom, United Arab Emirates, Yugoslavia, Zambia and Zimbabwe

7. IMAGE SIZE: Choose pixel ratios for still shots and video here

8. TIME LAPSE: Select this menu item to take time lapse photos and to set the interval between the photos

9. MEASURE: Select this menu item to turn the measuring reticle on and choose between two styles and 3 display colors

10. DEFAULT SETTING: Returns all settings to the default setting. The Default settings are as follows:

    Mode: Camera or Still Shot Imaging
    Exposure: +0
    Image Effects: Normal
    Date: Off
    Language: English
    TV Out: NTSC
    Image Size: 2560 x 1920
    Time Lapse: Off
    Measure: Off

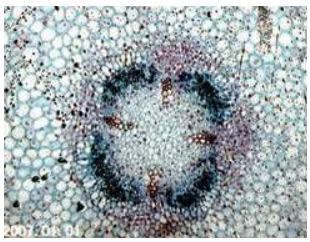
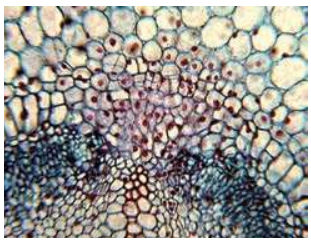
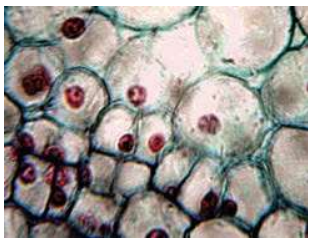
Taking Images

1. STILL IMAGES: To take a still image, make sure you first install your included 1G SD card (or your own SD card- max. size 32G) into the SD Card Slot (2) on the LCD housing. Make sure you are in camera mode by confirming the camera icon is displayed on the LCD screen. When ready, press the SELECT button and the image will be saved to the SD card.
2. VIDEO: Make sure you are in the VIDEO mode and the icon is displayed on the main screen . Begin recording by pressing the SELECTION button. When video is recording the recording icon REC will appear on screen and blink. To stop recording, press SELECTION button again.

***Note**: Inserting or removing an SD card while the LCD is on may cause the LCD to shut down and/or could damage the SD card.*

Sample Images

The following specimen images left to right below were taken at 40x, 100x, 400x of Vicia Faba Young Root C.S.

Reviewing and Managing Your Images

You can review and manage your snapshots and videos that are saved on the SD card.

1. Press and hold the MENU button until the SETTINGS menu opens. Press the SELECTION button when the SD CARD menu item is highlighted (see Figure 11).
2. Select the VIEW IMAGES menu item. Then scroll using the NAVIGATION buttons to the image you want to see. Press SELECT and the image with fill the screen. When you press the NAVIGATION buttons in this screen, it will scroll through all the images you have stored on the SD card. The process is the same for video. To review the video, use the SELECTION button.

Fig. 11

Transferring Your Images

To transfer images to a PC or MAC, you need to have a free USB port on your computer.

***Note**: Do not disconnect the USB cable while transferring images or damage may occur.*

1. Simply plug the cable into the USB port on the microscope (located on the left side of the LCD screen housing) and the other end in an available USB port on your computer as shown in Figure 12. The microscope will be recognized as an external drive (much like a digital camera). You can drag and drop, open from a program, or double click a file to open and then save to your computer.
2. Because all the memory is on the SD card, you can also remove the card form the SD slot and download using a card reader.

Fig. 12

TROUBLE SHOOTING

If the image quality does not look right or there is no image for some reason, try the following:

1. Make sure the AC Adapter is plugged in to an AC power source and attached to the microscope securely and correctly.
2. Make sure you have the illuminators turned on with maximum brightness adjustment (this is the normal position).
3. Make sure the objective lens you have chosen is set correctly and it has clicked in the right position.
4. Make sure that the filter wheel is set correctly at a click position so that the illuminated light comes up properly.
5. Make sure the specimen slide is correctly fit into the clamp on the mechanical stage and that it is properly centered.
6. If the stage is wobbly or erratic in movement, make sure all screws on the top and side of the stage are tight. Especially the two very small screws to the left of the long stage knob (see Figure 8).

CARE, MAINTENANCE, AND WARRANTY

Your Celestron microscope is a precision optical instrument and should be treated with care at all times. Follow these care and maintenance suggestions and your microscope will need very little maintenance throughout its lifetime.

- When you are done using your microscope, remove any specimens left on the stage.
- Turn off the illuminator switch.
- Turn off the LCD Monitor.
- Unplug the power cord.
- Always place the plastic bag or dust cover over the microscope when not in use or when being stored.
- Store the microscope in a dry and clean place.
- Be very careful if using your microscope in direct sun light to prevent damage to the microscope or your eyes.
- When moving your microscope, carry it by the "arm" with one hand and not by the focuser knob, LCD monitor, etc. Then, put your other hand under the base for support.
- Clean the outside surfaces (metal and plastics) with a moist cloth.
- Always unplug any cords before cleaning.
- Never clean optical surfaces with cloth or paper towels as they can scratch optical surfaces easily.
- Blow off dust with a camel's hair brush or an air blower from optical surfaces.
- To clean fingerprints off of optical surfaces, use a lens cleaning agent and lens tissue available at most photo outlets. When cleaning, do not rub in circles, as this may cause streaks and scratches to occur.
- Never disassemble or clean internal optical surfaces. This should be done by qualified technicians at the factory or other authorized repair facilities.
- When handling glass specimen slides, use care as the edges can be sharp.

WARRANTY

Your microscope has a two year limited warranty. Please see the Celestron website for detailed information at www.celestron.com.

EEC: This product complies with EEC guidelines in EN61558-2-6:1997 and EN61558-1:1997+A1

CELESTRON®

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CE FC RoHS

FCC 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 outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

This product is designed and intended for use by those 14 years of age and older.
Product design and specifications are subject to change without prior notification.