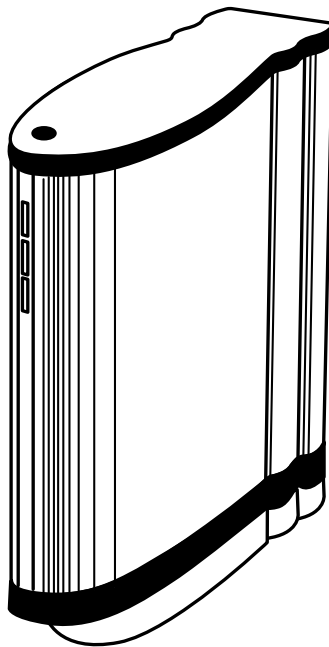


Polaroid



DMC 2

Online User Guide



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Navigating in This Document

This Polaroid electronic document uses the Adobe Portable Document Format (PDF) and its associated Acrobat Reader software. You should familiarize yourself with the controls of the Acrobat reader. Access **Help...Reader Online Guide...Viewing PDF Documents...Navigating Pages** for more information.

Polaroid electronic documents provide additional navigation tools at the top of the screen. The icons have the following meanings:

Click  to go to the table of contents.

Click  to return to the previous page.



Click



to display these help pages.

Click

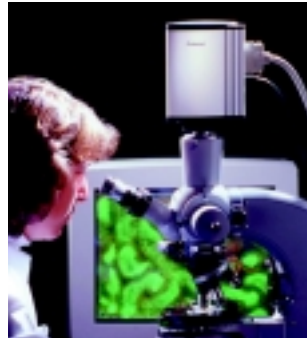


to open the index.



DMC 2 Camera Features

The Polaroid DMC 2 Digital Microscope Camera captures high-quality digital color images from light microscopes and other optical instruments. The camera uses a 2-million-pixel, 11mm CCD (charge coupled device) to capture 14-bit linear RGB images. It transfers these images in seconds to an IBM PC or Power Macintosh compatible computer in TIFF format with 1600x1200 or 800x600 pixels. On IBM PC compatible systems, an additional image size of 400x300 is available.



Next



Using the software provided with the camera, you can:

- Display a color viewfinder image on your computer screen.
- Choose resolution, exposure, sensitivity, color temperature, and other options.
- Automatically adjust exposure.
- Manually adjust color balance, brightness, contrast and sharpness.
- Verify focus digitally.
- Add a calibrated scale to the image.
- Add a title or other text to the image.
- Transfer the image to your image-editing application or hard drive.
- Capture a rapid sequence of images and select one for transfer to your computer.

Note: The DMC 2 software is compatible with DMC 2 and DMC Ie cameras.



The camera has a SCSI connection requiring no frame-grabber or other special hardware or software. (The camera requires a SCSI host adapter, usually built into Macintosh computers. SCSI host adapters can also be easily added to PC-compatible computers.)

Compatible with standard .63, 1:1 or larger c-mount adapters, the camera attaches easily to microscopes for most types of transmitted-light and reflected-light microscopy.

Multiple DMC 2 cameras can be connected in a SCSI chain to a single computer simultaneously for capturing images from multiple instruments without moving the camera or reconnecting cables.

The camera also features a tripod mount, x-sync connection and remote shutter connection for use with standard c-mount lenses on a copystand or tripod.

[Detailed camera specifications](#)



Taking Pictures

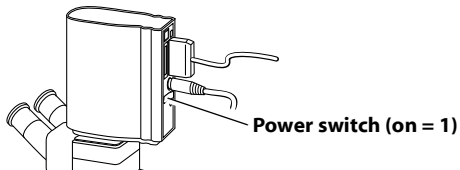
Typical Picture-Taking Sequence

- 1 *Turn on the camera.*
- 2 *Start the DMC 2 software.*
- 3 *Frame and focus the preview.*
- 4 *Choose a capture area*
- 5 *Choose color or grayscale preview.*
- 6 *Rotate the image.*
- 7 *Zoom the preview.*
- 8 *Set exposure.*
- 9 *Set sensitivity.*
- 10 *Select color temperature.*
- 11 *Select image type.*
- 12 *Select image size.*
- 13 *Verify sharp focus digitally.*
- 14 *Capture the image.*
- 15 *Enhance the image.*

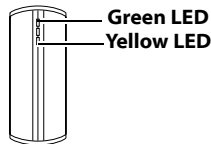


Turning the Camera On

- 1 Turn off the computer.
- 2 Turn the camera power switch to on (1).



- 3 Verify that the green and yellow LEDs are on, indicating AC and termination power are on.



- 4 Turn on the computer.



Starting the DMC 2 Software

Macintosh

Double-click **Polaroid DMC 2**.
The main DMC 2 window appears.

Windows

1 Select **Programs** from the **Start** menu.
2 Point to **Polaroid Digital Microscope Camera 2** and select **Polaroid DMC 2**.
The main DMC 2 window appears.

If more than one DMC camera is connected to the computer, you must select the camera to be used in this session. To select a camera, see [Selecting a DMC Camera](#).



Selecting a DMC Camera

If more than one DMC camera is connected to the computer, use these steps to select the camera to be used in the current session:

Macintosh



- 1 Click the Preferences button in the main DMC 2 window.
- 2 Click **Choose a DMC 2** in the DMC 2 Preferences box.
- 3 Choose the SCSI address of the camera to be used.
- 4 Click **OK** to activate the camera.
- 5 Click **Save** to close the DMC 2 Preferences box.

Windows

- 1 Click **Set Preferences** on the Tools menu.
- 2 Click the **Cameras** tab.
- 3 Click the SCSI address of the camera to be used.
- 4 Click **OK**.



Framing and Focusing the Preview

- 1 View the subject through the microscope eyepiece.
- 2 Adjust subject position, focus and lighting according to the microscope instructions.
- 3 If your microscope requires, manually switch the light path to the camera.
- 4 If a viewfinder image is not visible in the DMC 2 software main window, click the **Preview** button.

Note: If clicking **Preview** does not display an image, you may need to adjust exposure or sensitivity before continuing.

Exposure adjustment instructions.

Sensitivity adjustment instructions.



Choosing a Capture Area

You can capture the entire DMC frame or a smaller, selected area.

To capture an area smaller than the DMC frame:

- 1 Adjust exposure to obtain an acceptable image on the **Viewfinder Display** tab of the main DMC 2 window.
- 2 Click the **Region of Interest Selection** tab.
- 3 Select the size of the frame to be captured (3/4 or 1/2 frame) from the **Capture Area** list.
A box defining the selected capture area appears on the image.
- 4 Position the capture area as desired by dragging it.



- 5 Click the **Viewfinder Display** tab to view only the capture area. The values available in the **Image Size** box correspond to the capture area you selected.
- 6 Continue with the picture-taking sequence.



Choosing Color or Grayscale Preview

You can view the preview image in the DMC 2 main window in either color or grayscale. A color preview provides a more accurate representation of the final image, while a grayscale preview refreshes faster.

To view a color preview image, select **Color** in the main DMC 2 window. To view a grayscale preview image, deselect **Color**.



Rotating the Image



To correct picture orientation, you can rotate the preview image 180 degrees by clicking the rotate button.



When you rotate the preview image, the final image is also rotated.



Enlarging the Preview

You can enlarge the view of the preview image for focusing and closely inspecting detail while framing. Enlarging the view does not affect the final image.

To enlarge the preview image:

- 1 Click the image to display the zoom and focus box.
- 2 Drag the zoom and focus box to the area of interest.
- 3 To zoom in, click . To zoom out, click .



Setting Exposure Automatically

- 1 If you have not done so, calibrate automatic exposure for the current lighting and specimen conditions. See [Calibrating Auto Exposure](#).
- 2 Click the **Auto** button in the main DMC 2 window.
- 3 Wait a few seconds for the DMC 2 software to optimize the exposure.



Calibrating Auto Exposure

- 1 Manually set exposure to the optimum position for the current setup. See [Setting Exposure Manually](#).
- 2 Click **Calibrate Auto Exposure** on the **Tools** menu.
- 3 Click the **Set** button in the Auto Exposure Calibration box.



Setting Exposure Manually

Drag the Exposure slider right or left to adjust the camera shutter speed for brightening or darkening the image.

Range: 20 milliseconds (far left) to 8 seconds (far right).



Setting Sensitivity

Choose a sensitivity (camera gain) setting from the Sensitivity list:

- Low (ISO 25 equivalent)
- Medium (ISO 50 equivalent)
- High (ISO 100 equivalent).

The default setting is Medium (ISO 50 equivalent).



Selecting Color Temperature

You can select one of the standard color temperatures to match your lighting:

- Tungsten (3200K)
- Daylight (5500K)

These color temperatures are appropriate for many lighting situations, but best results are often obtained by creating and using a custom color temperature. This custom temperature appears as **Custom** in the **Color Temperature** list.

See [Creating a Custom Color Temperature](#).



Creating a Custom Color Temperature Setting

If the standard color temperature settings are inappropriate for your lighting, you can create a custom color temperature setting based on the actual lighting.

To create a custom color temperature:

Macintosh

- 1** Select **Calibrate Custom Color Temperature** from the Color Temp popup menu.
- 2** Obtain a properly exposed and focused image in the DMC 2 preview window.
- 3** Move the specimen to view a clear area of the slide.

Windows

- 1** Click **Calibrate Custom Color Temperature** on the **Tools** menu.
- 2** Obtain a properly exposed and focused image in the DMC 2 preview window.
- 3** Move the specimen to view a clear area of the slide.



Creating a Custom Color Temperature Setting (continued)

Macintosh

- 4 Click **Calibrate**.
- 5 Wait for the Calibrate Color Temperature box to close.
- 6 To use the custom setting, select **Custom** from the **Color Temp** popup menu.

Windows

- 4 Click **Begin**.
- 5 Wait for the Calibrate Custom Color Temperature box to close.
- 6 To use the custom setting, select **Custom** from the **Color Temperature** box.



Selecting Image Type

You can select one of these image types for your final image from the Image Type box:

- 48-Bit Color (68.7 billion colors)
- 24-Bit Color (16.7 million colors)
- 16-Bit Grayscale (65,000 gray shades)
- 8-Bit Grayscale (256 gray shades)

The image type you choose affects the size of the image file. See [Image File Sizes](#).

Note: Before saving images as 48-bit color or 16-bit grayscale, verify that other applications you intend to use support TIFF images in those formats. For example, Adobe Photoshop version 5 supports 48-bit color images, but earlier versions do not.



Selecting Image Size

Choose a final-image size from the **Image Size** box:

- 1600 x 1200 pixels
- 800 x 600 pixels
- 400 x 300 pixels (Windows systems only)

These sizes are available if your selected region of interest includes the entire frame. If your region of interest is smaller, the available image sizes correspond to the size of the selected region.

Larger image sizes usually improve image quality, but they also increase the image file size and time required to transfer the final image from the camera to your computer. See [Image File Sizes](#).



Image File Sizes


The size of the saved TIFF image depends on image type and size, as shown in the following table. (File sizes are approximate.)

Image Size (Pixels)	48-Bit Color	24-Bit Color	16-Bit Grayscale	8-Bit Grayscale
1600 x 1200	11,300 kbyte	5,650 kbyte	3,800 kbyte	1,900 kbyte
800 x 600	2,900 kbyte	1,400 kbyte	1,000 kbyte	500 kbyte
400 x 300 (Windows only)	700 kbyte	350 kbyte	240 kbyte	120 kbyte



Verifying Sharp Focus Digitally

If necessary, you can fine-tune your image focus digitally with the DMC 2 software:

- 1 Click the image to display the zoom and focus box.
- 2 Drag the zoom and focus box to the area of interest.
- 3 Zoom into the area of interest by clicking .
- 4 Click **Focus Tool** on the Tools menu.
The Focus Tool box appears.
- 5 Adjust the microscope focus knob until the two colored indicator bars are farthest to the right.
The red bar indicates the maximum sharpness achieved so far. The other bar indicates the current sharpness.
- 6 Close the Focus Tool box by clicking the Close button in the upper right corner.



Capturing the Image

After you have selected the capture settings in the DMC 2 main window, you are ready to capture the image and transfer it to the computer.

You have the following three options for capturing the image:

- *Capture the image, enhance it with DMC 2 software, then save it as a TIFF file.*
- *Capture and save the image immediately as a TIFF file.*
- *Capture and transfer the image to a plug-in compatible application (Macintosh) or Capture and transfer to a TWAIN-compatible application (Windows).*



Capturing and Enhancing with DMC 2 Software

Use this procedure to capture the image currently displayed in the DMC 2 main window for enhancement with DMC 2 software:

- 1** Click **Capture & Enhance** to capture the image, transfer it to computer memory, and display it in the DMC 2 Enhance window.
- 2** Use the controls in the Enhance window to enhance the image characteristics, add a text label, or add a calibrated micron marker.

Instructions for enhancing the image



3 Do one of the following:

Macintosh

- Save the image to disk by clicking **Save Image** (not available when running the DMC 2 plug-in).
- Transfer the image to a plug-in compatible application by clicking **Transfer Image** (available only when running the DMC 2 plug-in).

Windows



Save the image to disk by clicking the Save button.



Transfer the image to a TWAIN compatible application by clicking the Transfer button (available only when running the DMC 2 TWAIN source within the application).



Capturing and Saving Immediately to Disk

To capture the image and save it to disk without further enhancement:

- 1 Click the **Capture & Save** button.

Note: On Macintosh systems, this option is available only when running the DMC 2 software. When running the DMC 2 plug-in within another application, click Capture & Transfer. Then save the image within the other application.

- 2 Choose a folder and filename for the image.
- 3 Click **Save**.



Capturing and Transferring to Another Application (Macintosh)

Note: This option is available only if you are running the DMC 2 plug-in within the other application. It is not an option if you are running the DMC 2 program.

To capture the image and display it in the application, click the **Capture & Transfer** button and wait for the image to appear in your application.

After the image appears, you can edit, print or save it according to instructions provided with the application.



Capturing and Transferring to Another Application (Windows)

Use these steps if you want to transfer the captured image immediately to another image-processing or image-analysis program. The procedure you use depends on whether you opened the DMC 2 program from the Windows Start menu or you opened the DMC TWAIN software by selecting Acquire from an application's File menu.

If you opened the DMC 2 program from the Windows Start menu:

- 1** In the DMC 2 main window, click **Set Preferences** on the **Tools** menu.
- 2** Click the **General** tab.
- 3** Click the **Launch External Application** box to enable it.
- 4** In the **External Application Path** box, type the path and name of the program file to which you want to transfer the DMC images. You can also click the **Browse** button and select the program file.




5 Click **OK**.

When you click **Capture & Save** or the save button in the DMC 2 program, the image appears in the selected application for further enhancement and saving.

If you are running the TWAIN version of DMC 2 software:

If you are in the DMC 2 main window, click **Capture & Transfer**. Wait for the image to appear in your program.

If you are in the DMC 2 Enhance window or the Full Image window, click the transfer button . Wait for the image to appear in your program.

After the image appears in your program, you can edit, print or save it according to instructions provided with the program.



Capturing a Rapid Sequence

The DMC camera and software allows you to capture a rapid sequence of images in the camera memory. After the images are stored, you can select one of the captured images for transfer to the DMC 2 Enhance window or for saving immediately.

To capture a rapid sequence:

- 1 Set up the camera and obtain a properly exposed image in the DMC 2 main window.
- 2 Connect the remote trigger cable to the camera.
- 3 Click the **Rapid Fire** button to display the Thumbnail Gallery.
- 4 Press the remote trigger button to capture an image and display its thumbnail in the Thumbnail Gallery.



- 5 Repeat step 4 as needed to capture and display additional thumbnails until the camera buffer is full.

Note: Change the Rapid Fire setting on the **General** tab of the Set Preferences box to stop capturing images when the buffer is full or to begin overwriting the first images captured.

- 6 Right-click a thumbnail you want to transfer.

A shortcut menu appears.

- 7 Click **Image Output Size** and select an image size.

- 8 To display the image in the Enhance window for image enhancement before saving, right-click the thumbnail again and click **Enhance**. Then adjust color, brightness, gamma, etc., as usual and save the image.

To save the image immediately, right-click the thumbnail and click **Save**.



Printing the Image

To print the current image from the DMC 2 Enhance window:

Macintosh

Select **Print** from the **File** menu.

Windows



Click the print button to open your printer dialog box. Choose the appropriate printer settings and click **OK**.

The image prints at 300 dpi and sized to fill the page.

Note: To print at different resolutions or sizes, save the image and open it with an image-editing application such as Adobe Photoshop.



Enhancing the Image with DMC 2 Software

After you capture an image by clicking **Capture & Enhance** in the DMC 2 main window, the captured image is stored in memory and displayed in the DMC 2 Enhance window. Before printing, saving or transferring this image to another application, you can apply the following enhancements:

- *Automatically adjust color balance*
- *Adjust color balance by selecting a point that should be white*
- *Adjust color balance by selecting a point that should be neutral gray*
- *Adjust color balance by selecting a point that should be black*
- *Manually adjust color balance*
- *Manually adjust dark levels*
- *Manually adjust brightness*
- *Adjust gamma*
- *View a histogram*
- *Adjust sharpness*
- *Reduce grain in long exposures*
- *Add a label*
- *Add a calibrated micron marker*
- *Save and reuse program settings*



Automatically Adjusting Color Balance



To have the DMC 2 program analyze the current image and automatically set the color sliders to their optimum position, click the automatic balance button.

This feature is not recommended for fluorescent imaging.



Adjusting Color Balance by Selecting a Whitepoint



To adjust overall color balance by identifying a whitepoint in the picture, click the white eyedropper button. Then click on an area of the picture that should be pure white.

The area you clicked becomes white, and all other colors in the image are adjusted accordingly.

You may need to repeat the procedure to achieve an optimum white balance.



Adjusting Color Balance by Selecting a Neutral Gray Point



To adjust overall color balance by identifying a neutral gray point in the picture, click the gray eyedropper button. Then click on an area of the picture that should be neutral gray, such as a metallic object, concrete, gray brick, or a shadow falling on a white object.

The area you clicked becomes neutral gray, and all other colors in the image are adjusted accordingly.



Adjusting Color Balance by Selecting a Blackpoint



To adjust overall color balance by identifying a blackpoint in the picture, click the black eyedropper button. Then click on an area of the picture that should be pure black.

The area you clicked becomes black, and all other colors in the image are adjusted accordingly

Polaroid



Manually Adjusting Color Balance

Drag the three Color sliders left or right to adjust color balance.

The effect of your settings appears in the preview image to the left.



Manually Adjusting Dark Levels

Drag the Dark Levels slider left or right to decrease or increase dark levels.

The effect of your settings appears in the preview image to the left.

Polaroid



Manually Adjusting Brightness

Drag the Brightness slider right or left to increase or decrease brightness.

The effect of your setting appears in the preview image to the left.

Polaroid



Adjusting Gamma

Drag the Gamma slider right or left to increase or decrease gamma (the apparent contrast between the highlights and the shadows).

The effect of your setting appears in the preview image to the left.



Viewing a Histogram


Use the histogram display to judge the distribution of brightness values in the current image. The horizontal axis represents all possible brightness values in the image (0-255) and the vertical scale represents the number of pixels at each brightness value. The Channel list lets you select a channel (Luminosity, Red, Green, Blue, RGB) for the histogram.

The histogram changes to reflect adjustments in the Exposure setting in the DMC 2 main window and other controls in the Enhance window.

How to view a histogram.



To view a histogram of brightness levels in the image:

- 1** If the DMC 2 main window is visible, click **Histogram** on the **Tools** menu.
If the Enhance window is visible, click the histogram button .
- 2** Select a channel for display from the **Channel** list (Luminosity, Red, Green, Blue, RGB).
- 3** If necessary, adjust the **Exposure** slider in the main DMC 2 window or adjust the controls in the Enhance window while viewing their effect on the histogram.



Adjusting Sharpness

Drag the Sharpness slider left or right to decrease or increase sharpness.

The effect of your setting appears in the preview image to the left.



Viewing the Full Image

If necessary, you can view the full image for close inspection after capturing but before saving. When viewing the full image, you can zoom and pan to assure you have captured the desired area and detail and that enhancements you applied have the expected results.

To view the full image:

- 1 In the main DMC 2 window, click **Capture & Enhance**.

The captured image appears in the Enhance window.

- 2 Enhance the image as needed.

- 3 Click the full image button  to display the image in the Full Image window.

- 4 Use the controls in the window to zoom, pan, print or save the image.



Reducing Grain in Long Exposures

You can reduce image grain in long exposures (longer than 500 milliseconds) by enabling the DMC 2 multi-frame averaging/dark subtract feature.

To enable or disable multi-frame averaging/dark subtract:

- 1 Click **Set Preferences** on the **Tools** menu.
- 2 Click the **General** tab.
- 3 Click the **Multi-Frame Averaging/Dark Subtract** box to enable or disable it.
- 4 If you are enabling the feature, select the number of light frames and dark frames. Higher light frame and dark frame values usually provide more grain reduction.
- 5 Click **OK**.



Adding a Label

Macintosh

- 1 Click the **Add Text Label** box.
- 2 Type a label or other descriptive information in the text box.
- 3 Select a font and a font size.
- 4 If necessary, click the **Bold** box to change the font to bold.

Windows

- 1 Click the white **Label** strip below the image
- 2 Type a label or other descriptive information.

This label appears at the bottom of the image when it is saved, transferred to another application, or printed.



Adding a Calibrated Micron Marker

DMC 2 software can add a calibrated scale or micron marker to the lower right corner of your image, providing an accurate tool for determining dimensions of features in the image.

To add a micron marker to the image:

- 1 If you have not already done so, create a calibrated micron marker for the microscope objective you are using.

Creating a calibrated micron marker

- 2 Click the Add Micron Marker box.
- 3 Choose the marker appropriate for the microscope objective from the box that appears next to the Add Micron Marker box.



Creating a Calibrated Micron Marker

To create a calibrated micron marker you can add to the bottom of images for determining dimensions of features in the image:

Macintosh

- 1 Place a micrometer horizontally under the microscope objective and focus the microscope to obtain a sharp image of the scale in the DMC 2 main window.
- 2 Click the Add Micron Marker box.
- 3 Click the popup menu next to Add Micron Marker box and select Calibrate Objective.

Windows

- 1 Select Calibrate Objectives from the Tools menu.
The Calibrate Objectives Tips box opens.
- 2 Place a micrometer horizontally under the microscope objective and focus the microscope to obtain a sharp image of the scale in the DMC 2 main window.



Creating a Calibrated Micron Marker (continued)

Macintosh

The Micron Marker Calibration window opens and displays the micrometer image.

- 4 Define a measured distance on the micrometer image by dragging a line from one micrometer scale mark to another.

The measured distance appears as a green line. To correct the distance, draw a new line.

- 5 Type the distance represented by the line in the Distance box.

Windows

- 3 In the Calibrate Objectives Tips box, click the Snap button.

The Calibrate Objective window opens and displays the micrometer image

- 4 Define a measured distance in the image by clicking on one micrometer mark, then clicking on a second micrometer mark.

An “x” appears at each point you click.



Creating a Calibrated Micron Marker (continued)

Macintosh

- 6** Enter or select the units of measure in the Units popup.
- 7** Type a name for the marker in the Marker Name box.
- 8** Click Save Marker.

(End of Macintosh procedure)

Windows

To remove the second mark, click the Clear button. To remove the second and the first marks, click the Clear button twice.

- 6** Type the distance between the two marks in the Distance box, and choose the units of measure for the distance from the Measurement Unit box.
- 7** Type a description for this objective (30 characters, max.) in the objective description box.



Creating a Calibrated Micron Marker (continued)

Macintosh

(no further steps for Macintosh systems)

Windows

8 If you want this calibrated marker to be the default marker in the Enhance window, click the **Use as default objective** box.

9 Click **OK**.



Deleting a Calibrated Micron Marker

If necessary, you can delete a calibrated micron marker from the list box located below the **Add micro marker** box:

- 1 Click **Add micron marker** at the bottom of the Enhance window.
- 2 Click **Delete Micron Marker** from the list of micron markers.
- 3 In the Micron Marker box, click the name of the micron marker you want to delete.
- 4 Click **Delete**.
- 5 To remove additional micron markers, repeat steps 3 and 4.
- 6 Click **Close**.



Saving and Reusing Program Settings

If you develop settings in the Enhancement window that you expect to use frequently, you can save them to a file, then reload them when necessary.

If necessary, see [Program settings you can save](#).

To save the current program settings in the current settings file:

Macintosh

1 In the Enhancement window, click **Settings**.

2 Select **Save Settings**.

Windows

In the Enhancement window, click **Save Settings** on the **File** menu.



Saving and Reusing Program Settings (continued)

To save the current settings in a new settings file:

Macintosh

- 1** In the Enhancement window, click **Settings**.
- 2** Type a name for the new settings file.
- 3** Select **Save**.

Windows

- 1** If the main DMC 2 window is open, click **Settings** on the File menu to open the Settings window. Then click **New** to display the Add New Settings box.
If the Enhance window is open, click **Save Settings As** on the File menu to display the Add New Settings box.
- 2** In the **Settings Name** box, type a descriptive name for the new settings you are saving.
- 3** Click **OK**.



Saving and Reusing Program Settings (continued)

To load enhancement settings you saved earlier:

Macintosh

- 1** In the Enhancement window, click **Settings**.
- 2** Select the name of the settings to be applied.

Windows

- 1** In the main DMC 2 window, click **Settings** on the File menu to display the Settings window.
- 2** Click the name of the settings you want to load.
- 3** Click **OK**.



Saving and Reusing Program Settings (continued)

To delete a settings file:

Macintosh

- 1** In the Enhancement window, click **Settings**.
- 2** Select the name of the settings to be applied.
- 3** Click **Delete**.

Windows

- 1** In the main DMC 2 window, click **Settings** on the File menu to display the Settings window.
- 2** Click the name of the settings you want to delete.
- 3** Click **Delete**.
- 4** Click **OK**.



Program Settings You Can Save

When you save DMC 2 program settings for reuse (see [Saving and Reusing Program Settings](#)), the following settings are saved.

Main DMC Window Settings

- Color checkbox state
- Exposure
- Sensitivity
- Color Temperature
- Image Type
- Image Size

Enhance Window Settings

- Red
- Green
- Blue
- Dark Levels
- Brightness
- Gamma
- Sharpness



Program Settings You Can Save (Continued)

Preferences Box -- General Settings

- On each image capture
- Cast found on color balance
- Show preview on startup
- Use flash
- Save Viewfinder ROI settings on exiting the application
- Overwrite images during Rapid Fire
- Number of Light Frames
- Number of Dark Frames
- Launch External Application
- External Application Path

Note: The state of the **Multi-Frame Averaging/Dark Subtract** checkbox and the number of dark and light frames are **not** saved.



Program Settings You Can Save (Continued)

Preferences Box -- Remote Settings

- Use Remote Capture
- Transfer to Enhance Window
- Transfer to Application
- Save Directly to File
- Remote Capture Files Folder
- Remote Capture Files Base Name
- Remote Capture Files Image Type

Preferences Box -- Output Settings

- Highlight property (Specular or Non-Specular)
- Color Channel Mixture
- Color Output Scale
- Grayscale Channel Mixture
- Grayscale Output Scale

Preferences Box -- Cameras Settings

No Cameras settings are saved.



Setting DMC 2 Software Preferences

The DMC 2 Preferences dialog box (Macintosh) and the Set Preferences dialog box (Windows) let you choose these categories of settings for the DMC 2 software:

- *General*
- *Remote*
- *Output*
- *Cameras*

To display the Preferences box for viewing or changing preferences:

Macintosh



Click the **Preferences** button in the main DMC 2 window.

Windows

Click **Set Preferences** on the Tools menu.



General Preferences

Use the General tab to select general DMC 2 software operation preferences.

On each image capture:

Reset to defaults Resets all controls in the Enhance window (Color, Dark Levels, Brightness, Gamma, Sharpness) to their factory-defaults after you capture a picture.

Use existing settings Leaves all controls in the Enhance window unchanged after you capture a picture.

Do auto color balance Automatically analyzes the image and sets the Dark Levels and Brightness sliders in the Enhance window to their optimum values each time you click the Capture & Enhance button or the Capture & Transfer button in the Main window. Also sets the Enhance window color sliders to 0, sets the Gamma slider to 50%, and applies the color cast setting selected under "Cast found on auto color balance" (described below).



General Preferences (Continued)

Cast found on auto color balance (available only if Do auto color balance is selected under “On each image capture”):

Remove it Removes any overall color cast (tint) from the image when performing auto color balance.

Keep it Retains any overall color cast in the image when performing auto color balance.

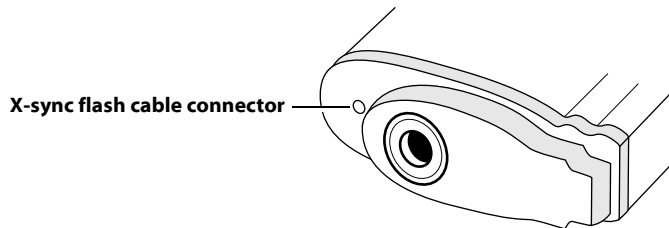
Always ask If an overall color cast is detected during auto color balance, displays a dialog box for removing or keeping it.



General Preferences (Continued)

Show preview on startup Expands the Main window to show a preview image when the DMC 2 program starts.

Use flash Activates the x-sync flash cable connector on the DMC camera when the image is captured. The default setting is off (disabled).





General Preferences (Continued)

Save Viewfinder ROI settings When the DMC 2 program is closed, saves the image capture area (region of interest) selected on the Region of Interest Selection tab in the DMC 2 main window.

Overwrite Images During Rapid Fire When camera buffer becomes full during a rapid fire sequence, begins overwriting the first file in the buffer instead of stopping rapid fire.

Multi-frame Averaging/Dark Subtract Enables multi-frame averaging and dark frame subtract for reducing grain in long exposures (longer than 500 milliseconds). After enabling this feature, select the number of light frames and dark frames. (Higher values increase grain reduction.)



General Preferences (Continued)

Launch External Application Starts the image-editing application specified in the External Application Path box when an image is saved to disk. Displays the saved image in the application.



Remote Preferences

Use the Remote tab to capture images using the remote trigger. You can specify if you want the captured images transferred to an image-editing program, the Enhance window, or to files.

Use Remote Capture Captures images using to remote trigger. Select if you want to capture multiple images remotely.

Transfer to Enhance Window Captures images and automatically transfers them to the Enhance window where you can manually adjust color balance, dark levels, or brightness, gamma or sharpness.

Transfer to Application Captures images and automatically transfers the image to an image editing program.



Remote Preferences (Continued)

Save Directly to a File Captures images and saves them directly to a file for viewing and enhancing at a later date.

Remote Capture Files:

Change Allows you to specify a location for your image files if you select Save Directly to a File. Also allows you to select the file format (TIFF, BMP or JPEG) and the base name of the saved files.



Output Preferences

Use the Output tab to select the highlight property and the output defaults of the images.

Highlight Property:

Specular Usually provides best image results with reflected-light microscopy specimens containing specular highlights (reflective or metallic areas or points much brighter than most of the image).

Non-specular Usually provides best results for reflected-light microscopy without specular highlights and for all transmitted-light microscopy.



Output Preferences (Continued)

Output Defaults:

For best results, choose the appropriate channel mixture and output scale for your specimen and the way the image will be used.

Color Channel Mixture

CRT color Optimizes the output image color for display on a monitor.

Identity Leaves the output image color as detected by the camera.

Portrait Optimizes the output image color for studio portrait photography software programs.

Fluorescent Optimizes the output color for fluorescent microscopy software programs.



Output Preferences (Continued)

Color Channel Mixture (continued)

User Use the custom color channel mixture in MATRIX2PUSER.MTX (for DMC 2 cameras) or MATRIXIEUSER.MTX (for DMC Ie cameras).

Color Output Scale

Tone Scale Optimizes the output image tone values for display on a monitor.

Linear Sets the tone value of each output pixel in proportion to the actual transmittance or reflectance measured by the camera.

Logarithmic Sets the tone value of each output pixel in proportion to the logarithm of the actual transmittance or reflectance measured by the camera.



Output Preferences (Continued)

Grayscale Channel Mixture

The Grayscale Channel Mixture uses the following (RGB channels) to produce a grayscale image:

Luminance Digitally provides the effect of a luminance filter for grayscale imaging.

Red Provides the effect of a red filter.

Green Provides the effect of a green filter.

Blue Provides the effect of a blue filter.



Output Preferences (Continued)

Grayscale Channel Mixture (continued)

Cyan (DMC Ie cameras only) Provides the effect of a cyan filter.

Magenta (DMC Ie cameras only) Provides the effect of a magenta filter.

Yellow (DMC Ie cameras only) Provides the effect of a yellow filter.



Output Preferences (Continued)

Grayscale Output Scale

Tone Scale Optimizes the output image tone values for display on a monitor.

Linear Sets the tone value of each output pixel in proportion to the actual transmittance or reflectance measured by the camera.

Logarithmic Sets the tone value of each output pixel in proportion to the logarithm of the actual transmittance or reflectance measured by the camera.



Camera Preferences

Use the Select Camera tab to select the active DMC camera when multiple DMC cameras are connected to the computer.

Cameras are identified by their Device IDs (SCSI addresses) and their Adapter IDs. To select a camera, click the appropriate line in the window and then click **OK**.



Using the Color Stacker Utility

The Color Stacker utility provided with DMC 2 software provides a way to combine three images. This is useful when imaging a single sample with multiple fluorochromes. Instead of viewing separate images, you can process the fluorochromes in red, green and blue channels and view the result in a single composite image.

Creating a Composite Image

Macintosh

- 1 Use the DMC 2 camera and software to capture and save an image for each of the three color channels. You must save the images in the TIFF format.

Windows

- 1 Use the DMC 2 camera and software to capture and save an image for each of the three color channels. You must save the images in the TIFF format.



Creating a Composite Image (Continued)

Macintosh

- 2 Open the Color Stacker utility (double-click **Polaroid Color Stacker**).
- 3 Select an image for each color channel by clicking each color button (**Red**, **Green** and **Blue**) and selecting the appropriate TIFF file.
- 4 Click **Create Composite**, select a folder and file name, and save the composite image.

Windows

- 2 Open the Color Stacker utility (click the Windows **Start** button, point to **Polaroid Digital Microscope Camera 2** on the **Programs** menu, and click **Polaroid Color Stacker**).
- 3 Select an image for each color channel by clicking each color button (**Red**, **Green** and **Blue**) and selecting the appropriate TIFF file.
- 4 Click **Create Composite**, select a folder and file name, and save the composite image.



Color Stacker Preview Options

The Color Stacker utility displays a preview of the composite image as you select files for each color channel. By clicking the **Options** button at the top of the Color Stacker window, you can select from one of these composite preview options:

- Show Original Image
- Show Relevant Channel
- Add Channel Progressively



Camera Maintenance

DMC 2 camera maintenance consists of cleaning the camera when necessary.

Click on either topic below for more information.

[*Cleaning the camera optics*](#)

[*Cleaning the camera body*](#)



Cleaning the Camera Optics

Important: Protect the DMC 2 camera from dirt, dust, rain and moisture. Damage caused by these conditions may not be covered by the warranty. Always protect the shutter, the anti-aliasing filter (behind the shutter), and the CCD sensor by placing the cap on the camera c-mount opening whenever the camera is removed from the microscope. This will also minimize the need to clean the camera optics.

Caution: The DMC 2 camera is a precision optical instrument. Carefully follow the instructions in this section when you clean it. Failure to do so could damage the shutter or the anti-aliasing filter and void your warranty.



Cleaning the Camera Optics (Continued)

Verifying the Location of Dust or Dirt

Avoid needless cleaning of the DMC 2 camera optics by determining the location of dust or dirt before proceeding. You can determine whether the dust or dirt is in the camera optics or the microscope optics by comparing two images as follows:

- 1 Take a picture with the camera in its normal position.
- 2 Rotate the camera 30 or 40 degrees, and take a second picture of the same specimen.

If the spot moves in relation to other elements in the picture, it is caused by dust on the camera anti-aliasing filter or the c-mount adapter lens. In this case, skip to [step 3](#) to determine the location.

If the dust remains in the same location relative to other elements in the picture, it is caused by dust on the microscope optics. Discontinue this procedure and refer to the cleaning instructions provided with your microscope.



Cleaning the Camera Optics (Continued)

- 3** Follow these steps to determine whether the dust spot is on the camera optics or the c-mount adapter lens:
 - a** Separate the camera from the c-mount.
 - b** Install the lens cap on the DMC 2 camera.
 - c** Clean the c-mount adapter lens according to the manufacturer's instructions.
 - d** Reattach the c-mount and the DMC 2 camera to the microscope and take a picture.
 - e** If the spot remains in the image, follow the *camera optics cleaning steps*.

If the spot is no longer visible, discontinue this procedure.



Cleaning the Camera Optics (Continued)

Camera Optics Cleaning Steps

- 1 If you have not already done so, install the shutter-opening software on your computer as follows. (This software opens the shutter, allowing you to clean the camera optics.)

Macintosh

- a Copy the file **DMC 2 SHUTTER OPENER INSTALLER** from the DMC 2 CD (provided with the camera) to the desktop.
- b Double-click **DMC 2 Shutter Opener Installer**.
- c Follow instructions on the screen.

Windows

No special installation is necessary. (The shutter-opening software is installed during DMC 2 software installation.)



Cleaning the Camera Optics (Continued)

2 Obtain the following cleaning materials:

- Clean camel-hair brush (small)
- Can of clean-room-grade compressed air
- Bulb-type manual blower
- Lint-free disposable cleaning wipe (such as e-wipe) or a high-grade lens tissue (non-abrasive and lint-free)
- Distilled water or methanol

3 Detach the camera from the microscope, and remove the c-mount adapter from the camera. If you are using the camera with a lens, remove the lens.

4 If the camera is not connected to the computer, turn off the camera and the computer. Then connect the camera to the computer.

5 Turn on the camera, then turn on the computer and wait for it to start.



Cleaning the Camera Optics (Continued)

6 Run the shutter-opening software:

Macintosh

- a Double-click **DMC 2 Shutter Opener**.
- b Click **Open DMC 2 Shutter**.
- c Click **OK**.

Windows

- a Select **Programs** from the Windows **Start** menu.
- b Point to **Polaroid Digital Microscope Camera 2** and select **Shutter Cleaning Tool**.

7 Power down the computer and turn the camera power off. (The shutter remains open.)



Cleaning the Camera Optics (Continued)

- 8 Clean the anti-aliasing filter (behind the shutter) with air. If necessary, gently dislodge any dust with the camel-hair brush.

Caution: Use care when inserting anything into the camera lens opening. The shutter blades and filter are easily damaged. If using canned air, be sure to hold the can upright to avoid spraying liquid propellant into the camera. Also avoid spraying canned air directly at the shutter.

- 9 If the filter is clean, skip to [step 10](#).

If dust or dirt remains after you use the air and the brush, follow these steps:

- a Moisten a lint-free wipe with distilled water or methanol.
- b Lightly wipe across the surface of the filter in a single direction only.

Note: Do not go over a previously wiped area with the same wipe, and do not reuse a wipe. Dirt collected on the wipe can damage the filter.



Cleaning the Camera Optics (Continued)

- c** If dust or dirt remains after the first attempt to wipe it away, repeat the procedure with a new, clean wipe.
- 10** After the filter is clean, close the shutter by turning the camera power switch on and then off.
- 11** Reattach the camera to the microscope.



Cleaning the Camera Body

If the DMC 2 camera body requires cleaning, use a clean, soft cloth dampened with water.

Do not use cleaners of any kind, and do not spray water or other liquids directly onto the camera.

Polaroid



Obtaining Software Updates

For the latest information about DMC 2 software updates, visit the Polaroid Web site:

www.polaroid.com



DMC 2 Camera Specifications

Sensor	2.1 megapixel, 11mm CCD
Output resolution	Super high resolution (1600x1200 pixels) High resolution (800x600) Normal resolution (400x300 pixels); Windows version only
Image formats	48-bit color (68.7 billion colors) 24-bit color (16 million colors) 16-bit grayscale (65,000 gray shades) 8-bit grayscale (256 gray shades)
Image transfer speed	Greater than 2 MB/second SCSI data transfer
Computer interface	SCSI-2
Weight	2.1 lb (963g)

Next



DMC 2 Camera Specifications (Continued)

Dimensions	2.1x7.2x5.1 in (5.3x18.3x13.0cm)
Power supply	100-250V, 0.38A, 50-60Hz surge-protected input +6 VDC, 2.0A output
Safety approvals	SA, CE, DVE
Limited warranty	1 year, parts and labor

Note: Specifications subject to change without notice.



System Requirements

Using the DMC 2 camera and software to preview, capture and enhance pictures requires a minimum level of computer hardware and software. If your system does not meet these requirements, contact your Polaroid dealer or your computer dealer.

[PC system requirements](#)

[Macintosh system requirements](#)



PC Minimum System Requirements

- 166 MHz Pentium processor and 64 megabytes (MB) of RAM. (96MB of RAM for a TWAIN-compliant image processing program such as Adobe Photoshop or Image-Pro.)
- Microsoft Windows 95, 98, Me, 2000 or NT (4.0 or later) operating system.
- ASPI-compliant SCSI adapter and the appropriate Windows drivers.
- 24-bit color display adapter.
- Light microscope with a .63x, 1:1, or larger C-mount adapter



Macintosh Minimum System Requirements

- PowerPC Macintosh computer or compatible with a SCSI-2 interface and 64 megabytes (MB) of RAM. (96MB of RAM for a Photoshop-Plug-In-compliant image processing program such as Adobe Photoshop or Image-Pro.)
- Apple system software version 8.6 or later.
- QuickTime software, version 4.0.3 or later.
- 80MB of available hard disk space.
- 24-bit color display adapter.
- Light microscope with a .63x, 1:1, or larger C-mount adapter



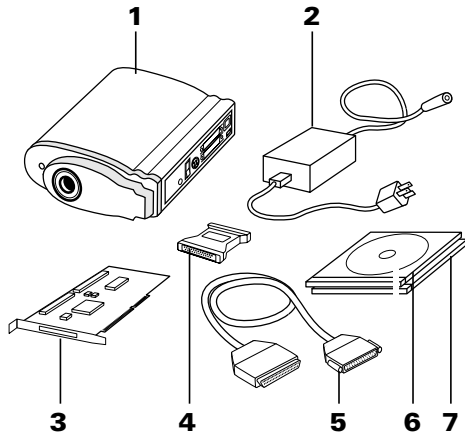
Installing Software and Setting Up the Camera

- 1 *Unpack.*
- 2 *Install the DMC 2 software.*
- 3 *Attach the camera to the microscope.*
- 4 *Connect the camera to the computer.*
- 5 *Connect the camera to AC power and turn on.*
- 6 *Take a test picture.*



Unpacking

Make sure you have all the following components. Contact your dealer if any is missing or damaged.



- 1** DMC 2 camera
- 2** power supply and cord (may differ from illustration for some locations)
- 3** SCSI host adapter installation kit for PCs (optional; contact your dealer)
- 4** SCSI cable adapter (HD50 to DB25)
- 5** SCSI cable (2-meter)
- 6** Polaroid DMC 2 Software CD with: TWAIN driver and Polaroid DMC 2 software for Windows 95, 98, Me, 2000 and NT; Adobe Photoshop plug-in and Polaroid DMC 2 software for Macintosh systems; online user's guide
- 7** Optional image-reporting software (available in some regions)



Installing the DMC 2 Software

- 1 Turn the computer on.
- 2 On Windows systems, close any applications that may be running.
- 3 Insert the Polaroid DMC 2 software CD into the drive.
- 4 Start the installation program:

Macintosh

Double-click the Polaroid DMC 2 Installer.

Windows

Wait for the DMC 2 install program to start.

If it does not, select Run from the Windows Start menu. Click Browse and select SETUP.EXE on the CD-ROM. Click OK.

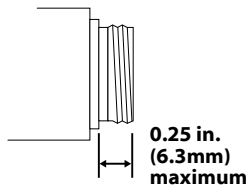


- 5 Follow instructions on the screen.
- 6 Remove the CD from the drive.

Attaching the Camera to the Microscope

You need a 0.63 or 1:1 c-mount adapter (not provided) compatible with your microscope. (Do **not** use a 0.5 c-mount adapter.) Refer to your microscope manual for more information about c-mounts.

Caution: Verify that the threaded end of the c-mount adapter does not exceed 0.25 in. (6.3mm). Longer adapters can damage the camera.



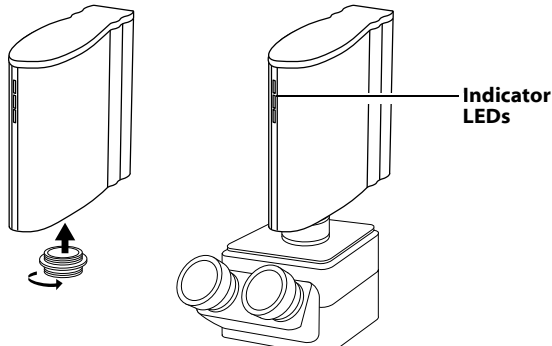


To attach the camera to the microscope:

- 1 Screw the c-mount adapter into the camera.

Note: Finger-tighten the adapter. Do not use tools.

- 2 Insert the c-mount adapter into the microscope. The camera indicator LEDs should face the front of the microscope.





Connecting the Camera to the Computer

The DMC 2 camera requires a SCSI host adapter in your computer. If your computer does not have an adapter, you must install one (see [Installing a SCSI Host Adapter](#)).

If your computer is a PC-compatible with a SCSI adapter, but the adapter is connected to a hard drive, installing a second adapter is recommended.



Setting the Camera SCSI Address

Each device connected to a SCSI host adapter must have a unique address from 0-6. To assure a unique address for the camera, determine the addresses of any other SCSI devices:

Macintosh

- 1** Run Apple System Profiles, usually on the Apple menu. If it is not, it may be available from www.apple.com/swupdates.
- 2** Click **Devices and Volumes** to view the SCSI device addresses.

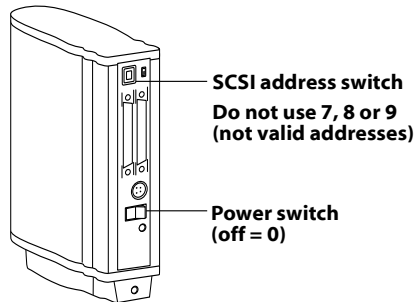
Windows

Look at the SCSI address switch on each SCSI device connected to your system. If necessary, see the instructions provided with the devices.



Setting the Camera SCSI Address (Continued)

Turn the camera power switch to off (0) and set the SCSI address switch to a value not used by any other device.



Note: The address is preset to 4. Do not change it unless another device is using 4. Other addresses typically available are 2, 5 and 6.

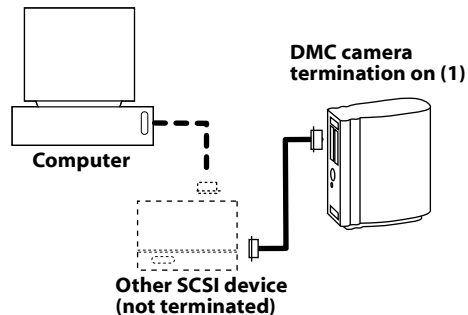
Next



Connecting the SCSI Cables

Place the DMC 2 camera at the end of the SCSI chain as shown or between the computer and other SCSI devices. Use the shortest possible cables.

Note: Turn the computer, camera and all other SCSI devices off before connecting or disconnecting any cables. **Do not connect the camera to the parallel connector on your computer. Doing so could damage the camera or computer.**



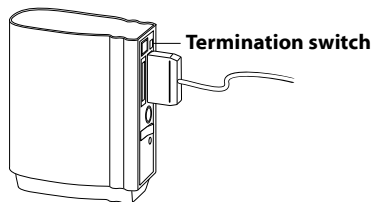


Setting Termination

The last device in a SCSI chain must be terminated (or have termination on), while all other devices must be unterminated (or have termination off).

If the camera is the only SCSI device connected to your computer or the last device in a SCSI chain, set camera termination to on (1). Otherwise, set termination to off (0). Termination instructions for your other SCSI devices are provided with the devices

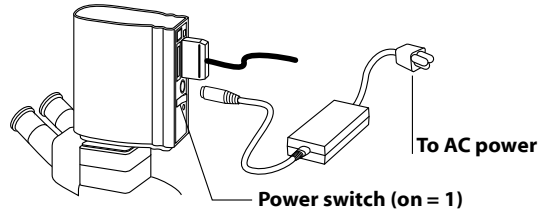
Note: Do not use an external, passive terminator to terminate the camera. If another device is at the end of the SCSI chain, that device must be terminated with an active terminator for proper camera operation.



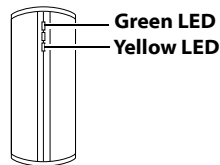


Connecting the Camera to AC Power and Turning On

- 1 Connect the camera to AC power and turn the power switch on.



- 2 Verify that the green and yellow LEDs are on, indicating AC and termination power are on.





- 3** Turn the computer on.
- 4** Wait for the system to install the camera driver and display the normal desktop.



Taking a Test Picture

- 1 Start the DMC 2 program:

Macintosh

Double-click **Polaroid DMC 2**.

Windows

- 1 Select **Programs** from the Start menu.
 - 2 Point to **Polaroid Digital Microscope Camera 2** and select **Polaroid DMC 2**.
-

- 2 Place a specimen under the microscope and focus it through the microscope eyepiece.
- 3 Click **Preview** in the DMC 2 main window. If necessary, adjust the c-mount on the microscope to focus the image on the computer screen. (Refer to your microscope manual for instructions.)



- 4 In the DMC 2 main window, choose the appropriate settings for the image being captured:

Exposure

Sensitivity

Color Temperature

- 5 Select **8-Bit Color** from the **Image Type** box for the test.
- 6 Click **Capture & Save** to capture and save the image to disk.
- 7 Open the saved image with an image-analysis application and verify that it was captured satisfactorily.

Note: The color balance of this test image may not be satisfactory because of variations in light source color temperatures. You can correct this problem by creating and using a custom color temperature setting. See [Creating a Custom Color Temperature](#).



Camera Limited Warranty

Polaroid Corporation warrants the DMC 2 camera against defects in manufacture or workmanship for a period of one year from the date of purchase. To verify the warranty period, you should keep the invoice, sales receipt, or other proof of the purchase date.

Should this product or any component or accessory included with it, with the exception of software, prove to be defective at any time during the warranty period, Polaroid Corporation will, at its discretion, either replace or repair this item, without charge.

This warranty does not cover damage caused by accident, incorrect installation, unauthorized modification, and misuse or abuse. A charge will be made for repair of such damage.

This warranty excludes all consequential damages. Some jurisdictions do not allow the exclusion or limitation of consequential damages, so the foregoing exclusion may not apply to you.



Radio and Television Interference

FCC Notice (U.S.A.)

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/relocate the receiving antenna.
- Increase the separation between the equipment and receiver.



FCC Notice (continued)

- 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.

Note: If your camera SCSI cable has a ferrite core on one end, that end must be connected to the camera.

FCC Caution: To assure continued compliance, any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Product: The Polaroid DMC 2 Microscope Camera

Marketed by: Polaroid Corporation, Cambridge, MA 02139 U.S.A. Telephone: 1-800-432-5355

Next



FCC Notice (continued)

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two considerations: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

EMI Notice (Canada)

This equipment is a Class A digital apparatus which complies with the Radio Interference Regulations, C108.8 - M1983.

Cet équipement est un appareil numérique de la classe A qui se conforme aux Règlements sur la brouillage radioélectrique, C108.8 - M1983.



Notice (Europe)

Warning: This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

Polaroid Corporation certifies that this product conforms to the following standards:

Low Voltage Directive 73/23/EEC/EN60950/IEC 950

EMC directive 89/336/EEC

EN 55022

EN 50082-1

IEC 1000-4-2/EN 61000-4-2

IEC 1000-4-3/EN 61000-4-3

IEC 1000-4-4/EN 61000-4-4.



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Technical Support

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Technical Support

If you need additional help with your Polaroid equipment, call your nearest Polaroid office at the number listed in *Polaroid Offices and Service Centers*. Polaroid offers a variety of customer support services. Call for details and applicable fees.

You may also write to:

Digital Imaging Technical Support
201 Burlington Road, 1-2A
Bedford, MA 01730

Internet Support

Technical support is also available over the Internet. Connect to the Polaroid Web site at **www.polaroid.com**.

Application Support

If you need help with your application software, please contact the manufacturer of the software.



Solving SCSI Communication Problems

SCSI device not recognized

Horizontal lines, sections missing from image

System stops responding during image transfer



Problem: Device not recognized

Failure of your computer to recognize a SCSI device could be caused by any of the following:

Device not turned on. Turn the power switch on. (See instructions for turning the device on.)

Cables loose or disconnected. Check all cable connections. (See instructions for connecting the SCSI cables.)

Device turned on after computer. Make sure the device is turned on, then restart the computer.

Incorrect SCSI address. Make sure the device has a unique SCSI address. (See instructions for setting the SCSI address of the device.)



Device not recognized (continued)

Incorrect termination. Check for proper SCSI chain termination. (See instructions for setting termination.)

Outdated miniport and ASPI layer drivers (Windows systems only). Update the SCSI host adapter Windows miniport driver (.MPD) files for your SCSI host adapter according to instructions provided with the adapter. (For Windows NT, miniport drivers have the extension .SYS.) Also make sure your system has the latest ASPI-layer files in the WINDOWS/SYSTEMS folder. Updated drivers are often available from your adapter manufacturer's site on the World Wide Web.

DOS drivers in CONFIG.SYS (Windows systems only). Edit the CONFIG.SYS file to disable any SCSI drivers. (Add REM to beginning of any SCSI driver lines).

Incompatible SCSI host adapter. Install an additional or different SCSI host adapter. (The adapter must be ASPI-compliant.)



Symptom: Horizontal lines, sections missing from image

If your images display horizontal lines or bands, check the following:

Incorrect termination. Check for proper SCSI chain termination. (See instructions for setting termination.)

Low-quality cables. Use only high-quality SCSI cables.

Cables are too long. Use shorter SCSI cables. Standard SCSI chains are limited to a total length of 6 meters. Fast SCSI chains are limited to 3 meters.

Faulty device (termination power fuse). Return device for service (see [technical support](#).)



Symptom: System stops responding during image transfer

If your system locks and stops responding to the mouse and keyboard during image transfer, check the following:

Incorrect maximum sync transfer rate or other settings (for Adaptec 2940 and 3940 host adapters only). Change the maximum sync transfer rate to its lowest setting (5.0 or 10.0, depending on the adapter model). See [Changing Sync Transfer Rate on Some Adaptec SCSI Adapters](#).

Device on same SCSI bus with hard drive or CD-ROM drive. Install a second SCSI host adapter for connecting the device. (See [Installing a SCSI Host Adapter](#).)



Changing Sync Transfer Rate on Some Adaptec SCSI Adapters

If your system has an Adaptec 2940 or 3940 SCSI host adapter, it may not recognize a SCSI device if the minimum sync transfer rate or other values are incorrectly set.

To change the minimum sync transfer rate and other important values for these SCSI adapters:

- 1 Restart your computer and wait for the following message to appear:

Press <Ctrl><A> for SCSISelect (TM) Utility!

- 2 Immediately press the Control key and A to display the SCSISelect menu.
- 3 Select **Configure/View Host Adapter Settings**.



4 Make sure the SCSI Device Settings are as follows:

Setting	Optimum Value
Initiate Sync Negotiation	No
Maximum Sync Transfer Rate	Minimum (5.0 or 10.0)
Enable Disconnection	No
Initiate Wide Negotiation	No

Note: Change these settings only for the SCSI address of the device not recognized. Leave all other settings unchanged.

- 5** Press **Esc** until you are prompted to save the changes.
- 6** Select **Yes**, then press the space bar to restart the computer.



Installing a SCSI Host Adapter

This device connects to a SCSI host adapter in your computer. Most Macintosh computers have a SCSI adapter built in, but most IBM PC compatible computers do not.

If you must install a SCSI adapter, turn the computer off and follow instructions provided by the adapter manufacturer. (The procedure usually includes software installation. If your PC uses the Windows NT operating system, log in as an administrator before installation.)

Note: A SCSI host adapter may have been provided as an option with your hardware device. If necessary, obtain an adapter from your computer dealer. (Adapters are not available for iMac computers.)



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