

Nikon Coolpix 950 X-mount setting recommendations

Front of Camera Controls

Mode switch	M-Rec Allows for the use of manual controls
FLASH	OFF The light source for the scope is the light source for the camera. You do not want the camera flash to influence the image. Some of the recommendation settings below automatically turn the flash off.
PICTURE MODE	Landscape This setting locks the focus at infinity and turns the flash off. Both are needed in this setup.
SENSITIVITY	+2.0 This setting increases the sensitivity of the CCD chip resulting in a higher shutter speed. Since vibration is a big problem with microscope photography, a high shutter speed is desired. Increasing the sensitivity adds a bit of noise to the image but this degrades the image far less than vibration. The settings and their corresponding ISO equivalents are; DEF (ISO 80), 100 (ISO 100), +1 (ISO 180) and +2 (ISO 360)
FOCUS	INFINITY The design of the photo mount assumes the camera is focused at infinity so the autofocus should be disabled. You can use either the scope or a monitor to determine focus while taking pictures. I think the scope is more accurate but has the disadvantage of not being able to see the framing. The scope and the camera need to focus on the same plane. Carefully parfocuse the scope and then focus the camera mount using the camera monitor or an external monitor.

Back-of-camera controls

ZOOM	W / T The correct setting is the maximum optical zoom.
EXPOSURE COMPENSATION	depends on image

this is the main method to correct for inaccurate exposure. Dental images usually require some type of adjustment, how much depends on many factors. Experience will teach how much for different situations. Usually one correction will suffice for the whole procedure. The exposure can be compensated +/-2EV in 0.3EV steps.

**EXPOSURE
MODE**

APERTURE PRIORITY – *f*-stop wide open

A wide aperture (low *f*-number) lets the most light into the camera and produces the highest shutter speed. Higher shutter speeds reduces the effect of vibration

IMAGE QUALITY

FULL & NORMAL

This setting seems to give the best balance between image size and quality. Which setting you use depends to a large degree on the intended use of the image. See appendix; “Preparing Images for computer Presentations” and “Image File Types” for a full discussion of resolution, file size, and compression ratios.

M-REC menu

WHITE BALANCE

WHITE PRESET

White balance is how the camera compensates for different light sources so the colors in the image look realistic. There are a number of options; **AUTO, White preset, sunny, incandescent, fluorescent, cloudy and flash.** In the AUTO setting the camera measures the light and makes a light balance calculation for each exposure. It assumes certain conditions exist in the image, which may not exist in a dental situation. Using White preset sets the camera to a setting that compensates for the light source on the scope as well as any influence the various lenses in the scope have on the color balance. This will give the most accurate and consistence colors to the images. The white target should be a very white matte paper like that use for high quality ink jet prints or a Kodak Gray Card.

There are two situations where this can be a problem. Both involve the use of transilluminated light from a fiberoptic light probe such as those used to locate fractures. If the fiberoptic light is a different color balance that the scope light the color balance will not be accurate. The other situation is using a strong transilluminated light and driving the light through the bone to locate a fracture deep in a canal. The light that eventually reaches the tooth is very red from the blood it goes through. In both of these situations it is probably better to use **AUTO.** see appendix; White Balance

METERING	MATRIX or SPOT There are three metering methods in the camera, matrix,spot and centerweighted . Matrix measures about 256 areas of the frame and is usually the best method for general use.
CONTINOUS	SINGLE There may be some specialized circumstances where the 16-shot or VGA sequence is appropriate but for almost all other situations single is the most appropriate setting.
BBS (best-shot)	ON This is an interesting setting only possible in a digital camera that tries to compensate for camera movement. As long as the shutter-release button is depressed, the camera takes a sequence of photos up to a maximum of ten. It then compares the photos and saves only the best one. Since movement is a real problem with microscope photography we can use all the help we can get. This seems to make a significant difference. It takes about 5 seconds for the camera memory buffer to fill up and another few seconds of calculations to select the best image. This is not really a problem once you are used to it. This setting turns the flash to OFF and precludes the use of multishot
DIGITAL TELE	OFF The digital zoom increases the range of the zoom by using less of the pixels in the image to give the appearance of higher magnification. The problem is the image degrades because less pixels make up the image. High magnification is not needed for our purposes. The camera should be set to the maximun optical telephoto with the digital zoom off.
USER SET	Store/retrieve setting Allows for the camera setting to be saved for the next time the camera is turned on
IMAGE ADJUSTMENT	STANDARD This setting adjust the image to increase or decrease the contrast or brightness. Normally you would not change these settings unless you do not plan to do any post-processing and you can see the results in the LCD.
BLACK & WHITE	NO This setting supposedly results in the highest quality image. Reports from users say the difference is minimal at

best. If you need a black and white photo for some reason the color image can always be converted in Photoshop.

LENS

NORMAL

AUTO OFF

depends on power source

This setting turns the camera off after thirty seconds if no actions are performed. With the camera in sleep mode the power consumption is minimal which conserves the batteries. It takes a few seconds for the camera to turn itself back on when the shutter button is depressed, so there is a delay before an image is taken. If the camera is powered by an AC adapter or an external battery pack the sleep mode can be set to 30 minutes which will leave the camera on during the whole procedure and eliminate the time delay of the camera booting up

SOUND

ON

In the sound-on mode the camera beeps when an exposure is made. This is a nice indicator that an exposure is made since the camera is dead quiet otherwise. In BBS mode the camera beeps only on the first exposure.