

**INSTRUCTIONS MANUAL
for the**

Canon A650

**used in conjunction with
doctoreyes™
Compact System**



Version 1.0/English - A4

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doctorseyes Compact System for the Canon A650

Dear Dental Photographer,

Congratulations and thank you for choosing the doctorseyes ring light System.

This manual will give you instructions and tips on how to set up your Canon A650 to be used in conjunction with the doctorseyes Ringlight and obtain optimal imaging results. Our lighting system is very easy to use and it's usage is very intuitive. In section A you will find how to mount and operate the ring light system. Section B will explain camera settings and section C will provide you with further useful information and show some example setups for dental photography. Furthermore you will find additional and more detailed information in the camera's user's guide.

As we strive for continual product innovation, your comments and suggestions are always welcome.

We hope you enjoy the world of digital dental photography.

*Thomas
Fanning*



Warning

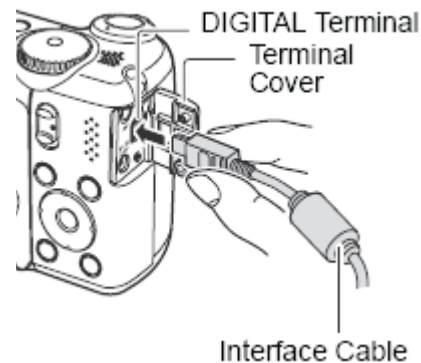
Never look directly into the LED light beam. The intense bright light can burn the retina. If necessary, provide the patient with protective eyewear or a mask.

Note: It is normal for the Ringlight to become warm when in use.



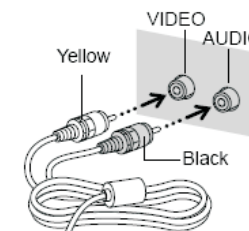
Warning

When working with patients, do not leave the power and light controller connected to the power supply. In addition, never leave the camera connected to its power supply.



the terminal cover by slipping a fingernail under the left edge and plug the AV cable in all the way.

- 3) Plug the other ends of the AV cable to the VIDEO IN and AUDIO IN jacks on the TV.
- 4) Turn on the TV and switch it to video mode.
- 5) Turn on the camera.



Technical specifications:

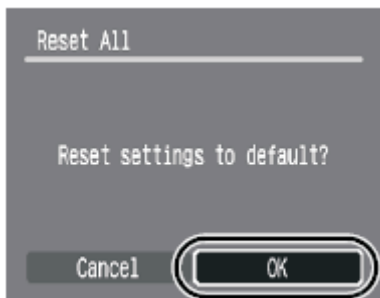
doctorseyes Power and Light Controller Compact PLC-4

dimensions (mm)...50 x 130 x 74
 weight.....240g
 charging capacity ..2200 mAh
 max. duration.....up to 3,5 hours
 voltage.....4,8 V =
 charging display ...yes
 charging voltage8V - 12V ~
 charging time.....approx. 3 hours

doctorseyes Power and Light Controller Compact PLC-C

dimensions (mm) ...55 x 124 x 30
 weight.....194g
 charging capacity ...2200 mAh
 max. durationup to 3,5 hours
 voltage4,8 V =
 charge display.....yes
 charging voltage.....8V - 12V ~
 charging timeapprox. 3 hours

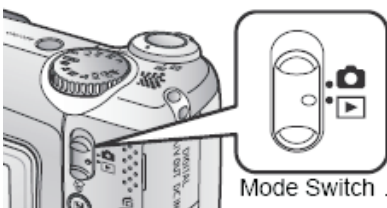
For more information on doctorseyes products visit:
Www.doctorseyes.com



5. Use the OK button to select [OK]
6. Press the FUNC/SET button to leave menu

8) Printing images directly from the camera

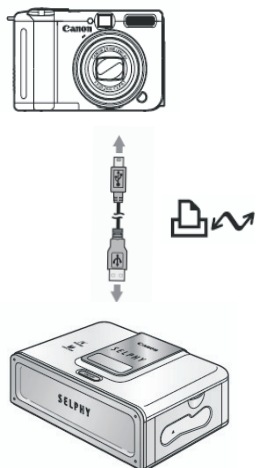
The camera allows you to print images directly from the without prior downloading to a computer.



Connect the camera to a printer that uses the standard printing protocol "PictBridge" You can also use a non-Canon printer as long as they work with PictBridge - check for the Symbol.

How it works:

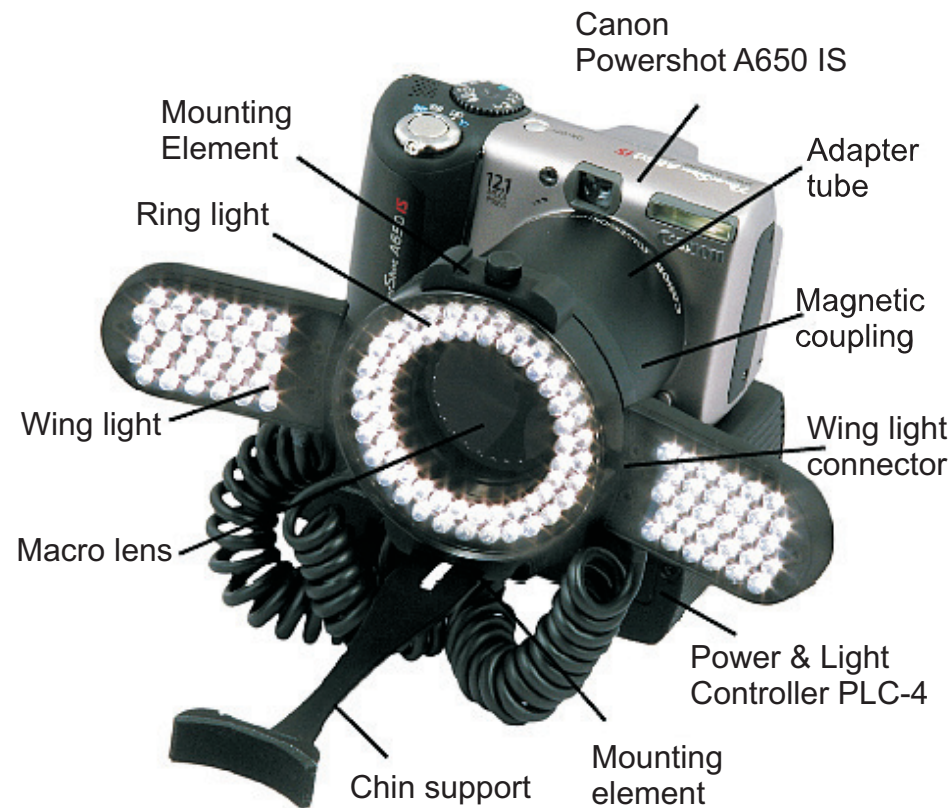
- 1) Turn the camera in playback mode.
- 2)The button on the back of the camera will be illuminated in blue.
- 3) Select an image in the display using the ← or → button and press the button to send it to the printer.
- 4) The button will blink blue and printing will start.



Shooting/Playback Using a TV

You can use the supplied AV cable to shoot or playback images using a TV.

- 1) Turn off the camera and the TV.
- 2) Connect the AV cable to the camera's A/V OUT terminal. Open

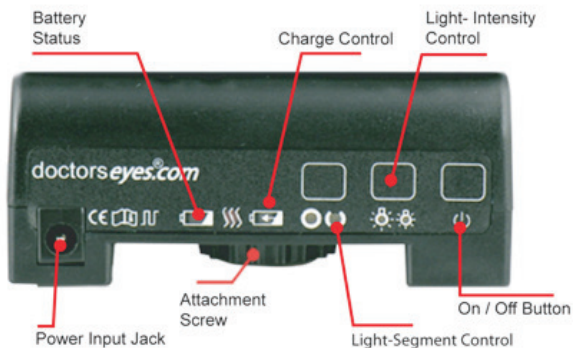




The compact system consists of:

- Canon A650 Digital Camera
- doctorseyes Ringlight
- Macro Lens +4
- Power + Light Controller "compact"
- Charging Unit for Controller
- Adapter tube for Canon A650
- Adapter ring 52-62
- Adapter ring with magnetic coupling 62-72

- Optional:
- Mirrors
- Diffusor
- Chinrest
- Mounting Element

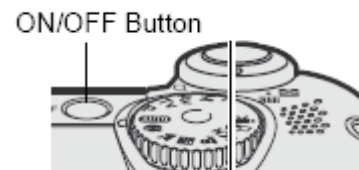


5) Display Grid lines

Helps confirm the vertical and horizontal positioning of the subject.

How to select:

- 1) Press the "ON" button on top of the camera to activate the camera
- 2) Press the "MENU" button on the right bottom corner on the rear side of the camera
- 3) Select the red "Rec" Menu - usually it is already selected
- 4) Step up or downwards with the direction button
- 5) Choose the option "Grid Lines" in the menu Display Overlay using the direction button to the right.
- 6) Press menu button to confirm choice



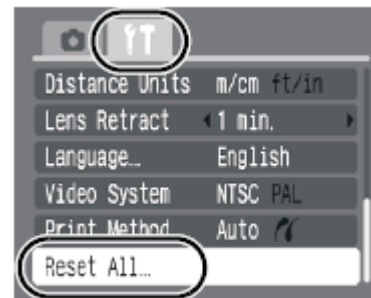
6) Quick-view of pictures

You can easily view your shots by just moving the switch on the rear side of the camera to playback mode



7) Resetting Settings to default values

1. Press the MENU button.
2. Use the button to select the menu.
3. Use the up or down button to select [Reset All].
4. Press the FUNC/SET button.





Accept the setting:

ISO Speed Equivalent
 Values: AUTO, High ISO Auto, 80, 100, 200, 400, 800
 Please choose a higher ISO Speed when your images seem to be out of focus. If you choose too high an ISO speed then the picture quality will decrease.

Safety Zoom Zone

Depending on the number of recording pixels set, you can zoom without pausing up to a factor where the image quality does not deteriorate (Safety Zoom).

The  icon displays when reaching the maximum zoom factor without image deterioration. At this point, the image can be further magnified by pressing the zoom lever toward  (telephoto) again.

- Depending on the number of recording pixels set, the Safety Zoom zone varies as follows.

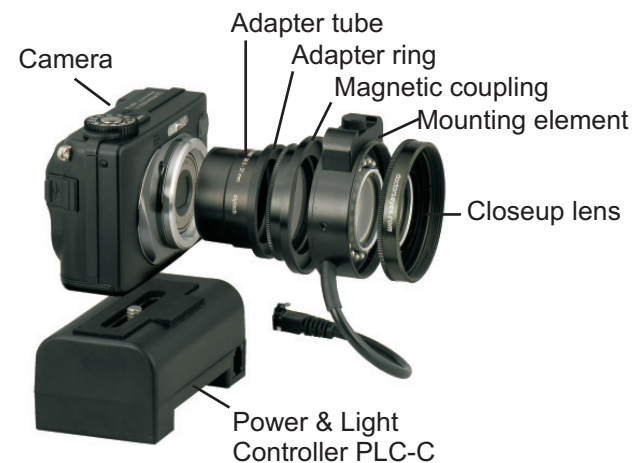
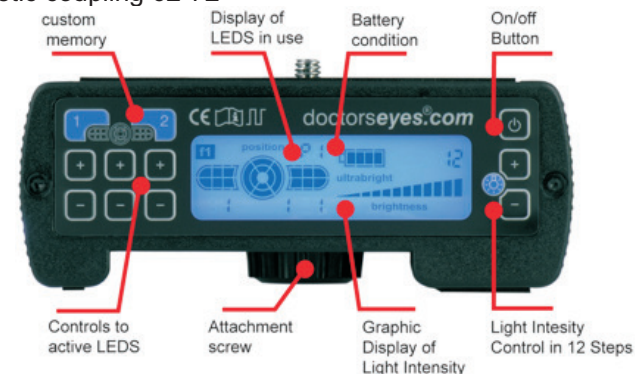
Recording Pixels	Optical Zoom	Digital Zoom
L (4000×3000)	6.0x	
M1 (3264×2448)	7.4x	
M2 (2592×1944)	9.3x	
M3 (1600×1200)	15x	
S (640×480)	24x	

-  White : Optical Zoom (Zone without deterioration)
-  Yellow: Digital Zoom (Zone without deterioration)
-  Blue : Digital Zoom (Zone with deterioration)

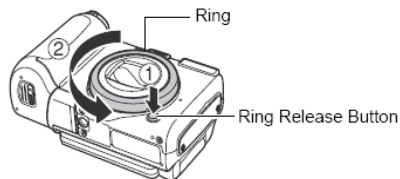
The professional system consists of:

- Canon A650 Digital Camera
- doctorseyes Ringlight
- Macro Lens +4
- Power + Light Controller "professional"
- Charging Unit for Controller
- Adapter tube for Canon A650
- Adapter ring 52-62
- Adapter ring with magnetic coupling 62-72

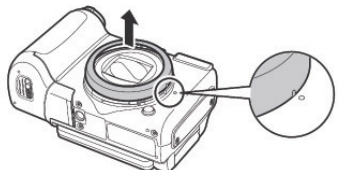
- Optional:
 Winglights
 Mirrors
 Diffusor
 Chinrest
 Mounting Element



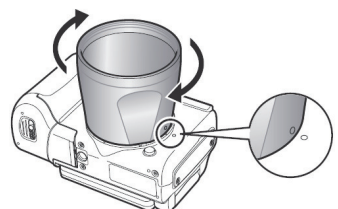
How to mount the Ringlight on the Canon A650



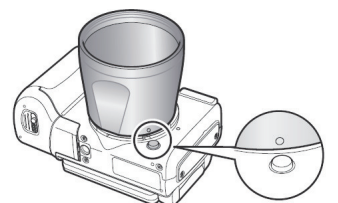
1. The camera should be turned off.
2. Press the ring release button, hold it down, and turn the ring counter-clockwise.



3. When the ○ mark on the camera and the □ mark on the ring are aligned, lift off the ring.



4. Align the ● mark on the lens adapter tube with the ○ mark on the camera. Turn the adapter tube clockwise as far as the mark on the camera goes. (To remove the adapter tube, including the Ringlight, turn the adapter in the opposite direction by holding down the ring release button.)



5. Screw on the 58-62 mm adapter ring with the magnetic coupling on the adapter tube.

6. Attach the Power & Light Controller to the bottom of the camera using the tripod screw.



7. Snap the Ringlight on the magnetic coupling and plug the cable into the Power & Light Controller.



8. When using the professional Power & Light Controller PLC-4 it is possible to attach the optional doctorseyes Winglights. Please Press on to the attachment

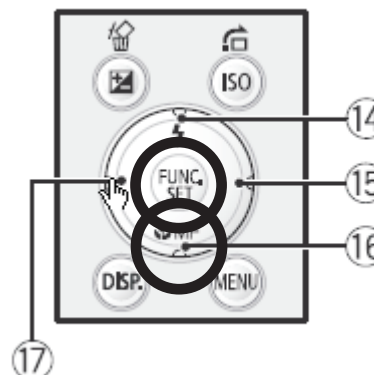
Filesizes:

L (large)	res.: 3648 x 2736 pxl
M (medium)	res.: 2816 x 2112 pxl
M2 (med.2)	res.: 2720 x 1704 pxl
M3 (med.3)	res.: 1600 x 1200 pxl
S (small)	res.: 640 x 480 pxl

Recommendation: choose Filesize above M2. M2 - S are for usage on PC screens.

How to change value:

- 1) Press FUNC/SET,
- 2) Step 6x downwards with direction buttons,
3. Choose desired resolution with direction buttons Left or right
- 4) confirm with FUNC/SET button



- 14 ⚡ (Flash)
- 15 ➡ Button
- 16 ⬇️
- 17 ⬅️ Button

Image compression:

You can choose 3 different compression rates: Superfine, Fine, Normal (choosing "normal" would allow more images to fit on the SD card but it results in less quality.

How to change value:

- 1) Press FUNC/SET
- 2) Step 5x downwards with direction buttons
- 3) Choose desired compression with left or right buttons
- 4) Confirm with FUNC/SET button

Recommendation:




Always use Superfine

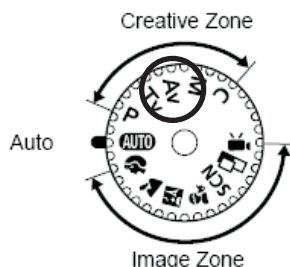
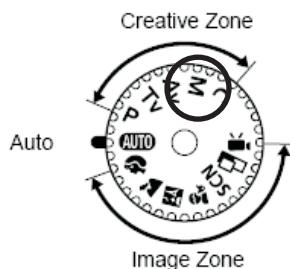
2) Best distance to object

Depending on the macro lens in use the best distance for taking dental shots might be in between 16 - 21.5 cm. You should use the display instead of the view finder because of parallax movement and for ergonomic reasons.



3) Improving depth of focus

Adjust depth of focus In the P-mode the Canon A650 automatically sets the shutter speed and aperture with acceptable depth of focus. If desired, you can influence the depth of focus by manually setting the camera's aperture and shutter speed. Turn the mode dial to the M-mode. The display will show an M in the upper right corner. To select shutter speed or aperture value, press the  button, then adjust the value using the  or  button. The higher the number, the smaller the aperture, thus more depth of focus. The aperture you select also depends on whether the zoom is set more to the W or T side. One can shoot pictures without using a tripod up to a shutter speed of 1/60 of a second.



4) Compression of data and adjusting the ISO Speed

Factors which affect image quality



View from above



View from above

spheres so they snap on. The spheres are located on the side of the Ringlight. The Cables are to be inserted into the sockets on the front of the Power & Light Controller.

9. Other options include the mountable mirrors, These are to be connected directly to the ringlight by sliding the mirror into the attachment element. The Screw will hold the mirror in the desired position.

Please attach the optional chin rest accordingly.



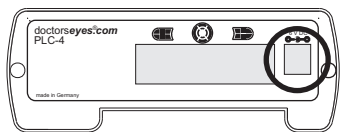
Bottom view

Bottom view

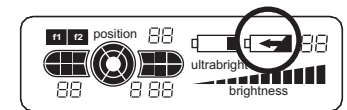
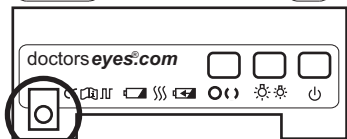
The doctorseyes diffusor

When using the ring light for smile shots the diffusor helps to smoothly spread the light output helping to prevent reflections and shading effects in between the leds and it has a softening effect.

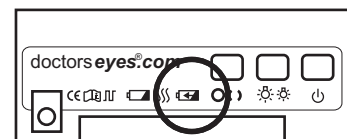




Power input jack



Charging Display PLC 4



Charging Control Display

Charging the Controller

When charging the controller, only use the power unit provided by doctorseyes. Connect the power unit to the socket on the front of the controller.

The blinking loading symbol shows the loading status even when the controller is turned off.

When the controller is fully charged, the loading symbol changes from red to green. The red low battery symbol disappears after charging.

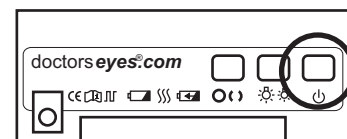
When the PLC4 is fully charged the blinking charging symbol will disappear. The elements of the battery will appear on the display. It will take approx. 3 hours to charge but you can stop charging at any time. The battery has no memory effect.

Important: You can have the battery connected to power constantly due to trickle charge. (Firmware version >2.3)

Working with the PLC-Compact Controller

On / Off button

is on the right upper front side of the PLC-C. When it is switched on the brightness display and the yellow segment display will light up



1) Examples for dental photography setups



Macro lens : **+4dpt**
 Dig. Zoom: **on**
 Zoom: **9,1x**
 Macro mode: **on**



Macro lens : **+4dpt**
 Dig. Zoom: **on**
 Zoom: **5,6x**
 Macro mode: **on**



Macro lens : **+4dpt**
 Dig. Zoom: **on**
 Zoom: **2x**
 Macro mode: **on**



Macro lens : **+4dpt**
 Dig. Zoom: **on**
 Zoom: **3x**
 Macro mode: **on**

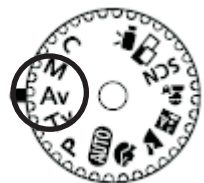


Macro lens : **+4dpt**
 Dig. Zoom: **on**
 Zoom: **4x**
 Macro mode: **on**



Macro lens : **+4dpt**
 Dig. Zoom: **on**
 Zoom: **3x**
 Macro mode: **on**





8) How to choose Av (Setting the Aperture)in the c mode (custom) to gain more depth of field.

Set the mode dial to Av and save these settings as described before in item 7. Now turn mode dial back to c mode (custom) to get hold of the settings which have been saves like the white balance or zoom position. It will show C in the right upper corner with a Av below it. By using the direction buttons ← or → you can now change the aperture to 8 as shown on your display at the bottom in the center position.



Aperture Value

Note: You will now gain the maximum depth of field but consider that the shutter speed will increase and this might cause camera shake.

C) Additional functions worth knowing

- 1) Examples for dental picture setups
- 2) Best distance to object
- 3) Improving depth of focus
- 4) Compression of data and adjusting the ISO Speed
- 5) Display gridlines on display
- 6) Viewing images on your computer
- 7) Resetting Settings to Their Default Values
- 8) Printing images directly from the camera



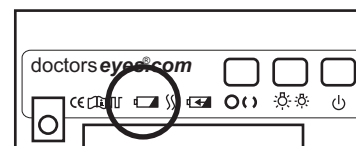
Brightness control

above the second button on the right side the brightness can be changed in 2 steps. The yellow symbol displays the actual setting



LED control

With the left button you can activate or deactivate LEDs in 4 configurations (half ring right - half ring left - simulation twin flash unit - full ring)



Brightness and battery capacity

The brightness of the ringlight will stay constant even if the capacity of the battery condition is decreasing. The Ringlight will shut off when the battery condition drops below minimum capacity. A red light will show an alert. The Controller can be used immediately after connecting to the main power.

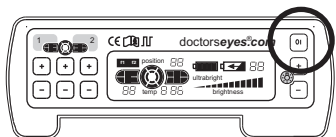


Charging the controller unit

The controller should be charged with the supplied charging unit. Connect the controller unit with the charging unit and then connect to the main power. The loading process is displayed with a flashing symbol. The charging process is finished when the red symbol turns green, The warning symbol for low capacity will stop glowing.

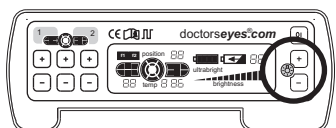


The PLC-4 Professional Power + Light Controller



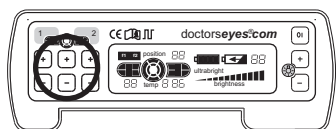
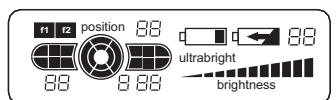
On / Off:

The PLC-4 can be activated with the button on the top right side and the blue display will be illuminated.



Brightness control:

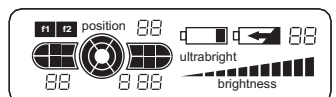
The brightness can be adjusted in 13 steps with “+” and “-” buttons on the right side. The current setting will be displayed via a bar chart and when reaching the brightest level the word “ultrabright” will be displayed.



Switching of LED segments:

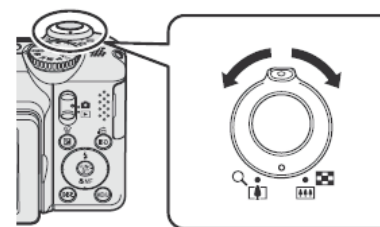
You can activate or deactivate segments on the Ring and Winglights. This gives the user a maximum of light situations.

The 3 pairs of buttons on the left side allows you control of the led segments. The activated segments will be displayed



Every Setting is also displayed with a specific number. When reaching the last setting the presets start from the beginning. The presets can be selected by pressing the buttons accordingly. When pressing the button longer than 1 sec., you step from one setting to the next more rapidly. This will speed up the process of finding the desired settings. You only need to look on the camera’s display.

Tip: When making shots of the front teeth then it is more efficient using



Zoom Bar



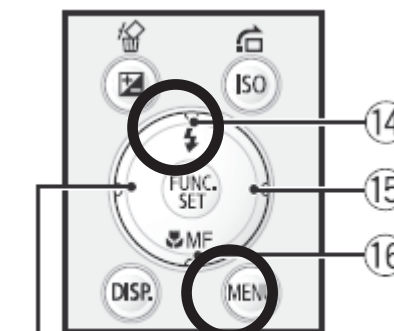
- region that should be in focus and **slightly press** the release button without taking a picture letting the camera focus. Keep your finger on the button slightly pressed down holding the point of focus and letting the AF frame turn green.
4. Then adjust the camera’s position until all the teeth and details are shown in the display of the camera.
5. Take the picture.

6) Determining the favorite zooming position

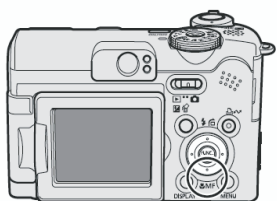
Determine your favorite zoom position by zooming in or out by adjusting the angle of view with the zoom lever. Saving your settings now lets the camera always go to the same zoom angle when starting up the camera.

7) Saving the settings

1. Press the MENU button
 2. step up 1 position for “save settings”
 3. choose yes by stepping to the right ➔
 4. confirm now all the settings will be saved to your custom "C" mode until changed again.
- You can leave the c mode at anytime and when you return to the c mode (custom) your settings that have been saved will be available again on demand



- 14 ⚡ (Flash)/
- 15 ➔ Button
- 16 🌸 (Macro)
- 17 ⬅ Button



- 15 → Button
- 16 (Macro)
- 17 ← Button

the digital zoom is used or when **T** is displayed.
 3. Press the FUNC/SET button.

Note:
 When using the doctorseyes ring & wing light we recommend using the custom white balance.

4) activating the macro mode

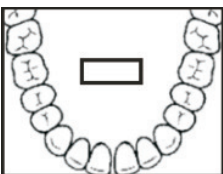
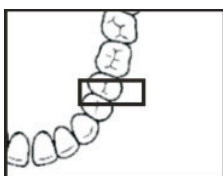
1. Press the **☑** button.
2. Use the **←** or **→** button to select the flower symbol.
 The zoom bar will display while you adjust the zoom. At zoom ranges not possible for macro photography, the bar will appear yellow and the **☑** icon will gray out. The image will be recorded at standard focusing distance. The **☑** icon will appear on the LCD display when active.

5) Selecting an AF Frame Mode

The AF frame indicates the area of the composition on which the camera focuses. Select "center" - the camera then fixes the AF frame at the center. This is convenient for making sure the focus is exactly where you want it.

how the "focus trick" works:

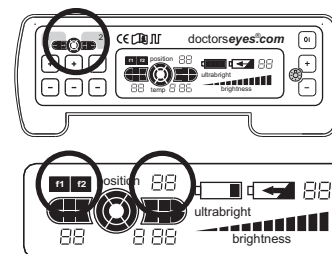
1. Press the MENU button.
2. In the **☐** menu, use the **↑** or **↓** Button to select [AF Frame].
3. Aim your camera to the tooth or



light supplied by the the wings and deactivating segments from the ring light.

Memory - storage function:

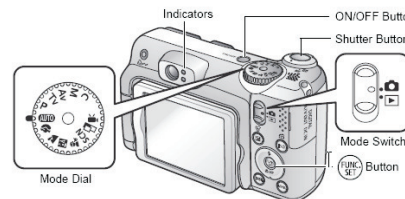
The PLC-4 allows for two preferred lighting combinations to be saved and each retrieved by the push of a button. This is especially helpful when a specific lighting combination is used repeatedly. To save a light segment combination, have the camera lit the way it should be saved. Press either the '1' or '2' button longer longer than one second. The light combination is stored when you see 'f1' and 'P1' in the controller display. To retrieve the lighting combination, press the same number again (either 1 or 2).



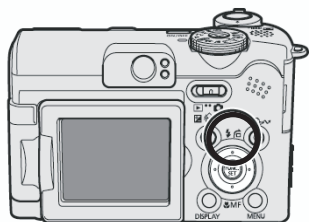
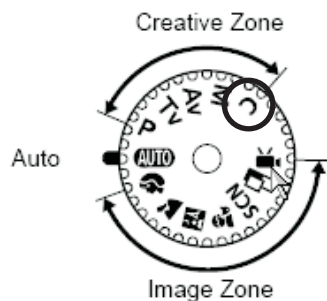
B) Summary of camera settings

The digital camera offers numerous settings and options for taking pictures. The following list summarizes settings and options one should choose for dental photography:

- 1) Switching to C mode (custom))
- 2) Shutting off the automatic flash light
- 3) Using the Custom White Balance
- 4) Activating the macro mode
- 5) Selecting an AF Frame Mode



- 6) Determining the favorite zooming position
- 7) Saving the settings
Note: Should your results not be as expected then you can always reset the cameras settings back to its delivery status and then perform setup for dental shots as described below. The setup process for dental photography will have been completed when the camera is delivered to you.
- 8) Setting the aperture in c mode (custom) to gain more depth in focus



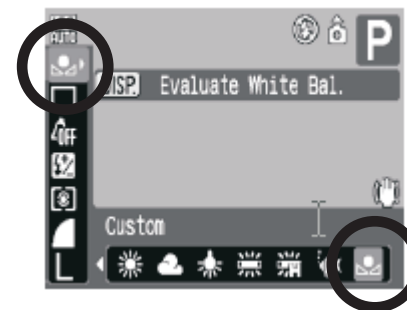
1) switching to C-mode (custom)

Turn the mode dial so that the C symbol is next to the marking. You can save frequently used shooting modes and various shooting settings to the C mode (custom). When necessary, you can then shoot images with previously saved custom settings by simply turning the mode dial back to C mode. Settings that are not retained when the shooting mode is changed or when the power is turned off (such as continuous shooting or self-timer) are instead retained.


2) Deactivation of the automatic flash light

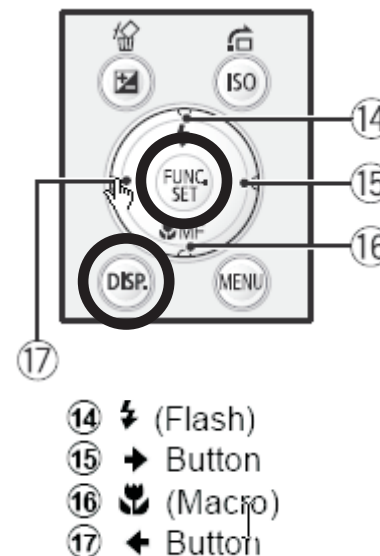
In order to work properly with the doctorseyes Ringlight, turn off the



camera's flash. Push the upper control button with the flash symbol repeatedly until the "no flash" symbol appears. The same symbol will appear later on the camera's display to remind you of the flash setting.



3) Using the Custom White Balance

The light supplied by our ring light is equivalent to a cloudy light situation. In order to reproduce the right tooth colours in your practice you should perform a custom white balance  reading with the camera. Some light situations are too difficult for the AWB (auto white balance) setting to interpret correctly.



1. Select 
 - Press the FUNC/SET button.
 - Use the ← or → button to select AWB and choose  with the FUNC/SET button.
2. Aim the camera at a piece of white paper or cloth and press the DISP button. If you are viewing it with the LCD monitor, ensure that the center frame is completely filled with the white image. If you are using the optical viewfinder, ensure that the entire field is filled. Please note, however, that the center frame will not display when