



Technical Details

# Automatic White Balance



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In order to accurately reproduce white and gray, color cameras must be adjusted for correct white balance. A camera with an uncalibrated white balance creates images with color casts and generally inaccurate color rendition.

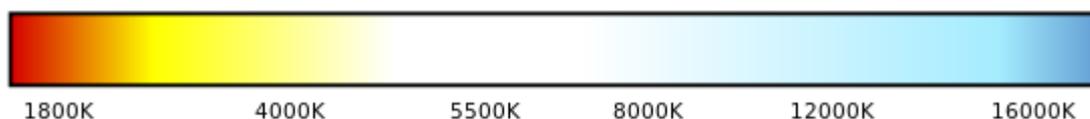
The included software, IC Capture, offers several ways of achieving correct white balance. Using the gray-world and color-temperature estimation methods, IC Capture automatically adjusts for white balance. Of course, the RGB values can also be manually adjusted.

## Gray World

Gray World is well-known color constancy method which, independent of the light source, delivers automatic white balance. This method delivers excellent results in almost every situation. Performance can, however, begin to deteriorate in some extreme situations. An example of this might be when no gray or white is present in the object or scene being imaged (as with a monochromatic surface). In such a case, the image is rendered as gray only.

## Color Temperature

Every light source can be described by its corresponding color temperature which is conventionally stated using the absolute temperature scale, Kelvin (K).



For example, average noon daylight has a color temperature of 5500K. If the color temperature of a given light source is known, this value can be used as a reference value for white or can be used to calculate the reference value. The major advantage of this method is that monochromatic surfaces can be correctly reproduced.



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## Some Light Sources and their Color Temperatures

Light Source	Color Temperature (K)
Household Tungsten Incandescent Bulbs (220 W / 220 V)	2790
International Standard for Average Daylight	5500
Clear Daylight (noon)	5600
Sun and Cloudless Sky	6000
Overcast Daylight	6700
Blue Northern Sky (45°)	11.000
Electronic Flash	5500-6500
LED (white)	6000-10.000
LED (warm white)	2500-3500
Fluorescent Bulbs (warm white) conference rooms, offices, residential living spaces	<3300
Fluorescent Bulbs (warm white) schools, offices, shop floors, show rooms	3300...5300
Fluorescent Bulbs (daylight) full-spectrum fluorescents in windowless rooms and for technical uses	>5300
Halogen Bulbs Similar to Tungsten Incandescent Bulbs	2300-2900



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