Computer Monitors and Display Colours – Fact Sheet

WHAT COLOUR SHOULD MY COMPUTER SCREEN BE?

The choice of colour for characters on your computer monitor is largely a matter of personal preference. However, several aspects of the display should be considered before you select the colours that you will use. The most important points to consider are the clarity (legibility) of the characters and the contrast between the colour of the characters and the background colour of the screen.

What should I know about “character colour”?

The consensus is that the “non-colours”, white and black, and the colours yellow, green, and orange are generally most acceptable. These colours (yellow, green, orange) are in the middle of the visible spectrum (the range of colours that our eyes can detect) and are the easiest for the eye to see. Our eyes are not as receptive or sensitive to the colours at the extreme ends of the visible spectrum (e.g., blue, violet/purple, and red). The focus point inside the eye for different colours is situated at different distances behind the lens. To simultaneously see different colours well, the eye has to focus quickly and alternatively at different distances. The further the colours are from each other in the visible spectrum, the more difficult the process is. When we try to focus at the same time on colours situated at opposite ends of the spectrum (e.g., red and blue), our eyes get more tired than when we focus on colours which are close to one another in the spectrum (e.g. green and yellow). Characters in colours situated at the extreme ends of the visible spectrum should probably be avoided unless displayed on a light or contrasting background.

Occasionally colours may create “after images” following prolonged viewing. For example, after looking at a green image for a period, when you look away, white images may appear pink-tinged. This is a harmless, very short term effect that can be caused by any coloured source (e.g., a painted surface), not just computer screens.

What is display polarity?

Positive polarity means that a monitor displays dark characters on a light background, while negative polarity means that light characters are displayed on a dark background. One polarity has little advantage over the other. The resolution of positive polarity screens tends to be less affected by glare (screen reflections). Also, the dark characters on a light background are similar to what we are most used to in print materials. On the other hand, it tends to make screen flicker more noticeable. Given the same luminance (intensity of the light from the screen), negative polarity provides better character contrast and is less prone to flicker. User preference should be the determining factor when setting display polarity.

What should I know about image contrast and resolution?

The image contrast is given by the ratio between the brightness of the “white” and the brightness of the “black” the monitor can reproduce. A higher contrast of the display can give the impression of increased brightness and can increase the capacity of noticing details.

There are two types of contrast ratio: “static” contrast ratio and “dynamic” contrast ratio.

The “static” contrast ratio is the contrast ratio that can be produced at any moment in time, and is determined by calculating the ratio between the brightness of “white” and the brightness of “black” within a single picture on a display situated in a complete dark room.

The “dynamic” contrast ratio compares the brightest whites and the darkest blacks from different scenes of a movie. The display equipped with dynamic contrast ratio (DCR) has the ability to make dark scenes even darker by adjusting the intensity of the backlight. In this way, the ratio between the luminosity of the whitest white among all images and the darkest black from all images increases. As a consequence, the dynamic contrast ratio is always much higher than the static contrast ratio.

The monitors used in offices do not usually have DCR technology, so they are characterized by the “static contrast ratio”.

Fairly sharp images and adequate contrast ratios are typically required to make a display easier to read.

The human eye can perceive changes in contrast up to about 1000:1 ratio. Changes are more noticeable when we pass from 10:1 contrast ratio to a 20:1 contrast ratio. As the contrast ratio increases the difference is noticed less. For example, the difference in contrast at ratios higher than 500:1 up to 1000:1 will seem minor. The contrast perceived by the viewer will be always less than the given contrast ratio for the monitor. This difference is due to the fact that the monitors are usually in an office setting where the reflection of the surrounding light will reduce the contrast.

What is acceptable to an individual will also depend on character size, viewing distance and the type of task being done. A properly functioning monitor will typically provide adequate resolution and a static contrast ratio up to 1000:1.