

Measurement of Full-Screen White, Black, Red, Blue, Green

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① Measurement conditions and light-measurement device (LMD)

~~Write down~~ LMD measures L (cd/m^2), x , y .

• Warm-up time for display (allow > 20 min)

• LMD directed perpendicularly at center screen

• LMD at 0.5 m distance from screen (if it is imaging LMD)

• Ambient ≈ 1 lx (Dark room)

N/A if screen-mounted sensor
(must be at center screen)

② Command, Target Values

| | command Level | | | L (cd/m^2) | Target values | | Notes. |
|-------|---------------|------|------|-------------------------|---------------|-------|--|
| | R' | G' | B' | | x | y | |
| White | 255 | 255 | 255 | 70 | .3128 | .3292 | (D65) |
| Red | 255 | 0 | 0 | N/A | .64 | .335 | Rec 601 (SMPT E) (CR EBU)* |
| Green | 0 | 255 | 0 | N/A | .30 | .60 | Rec 601 (SMPT E) (CR EBU) |
| Blue | 0 | 0 | 255 | N/A | .15 | .065 | Rec 601 (SMPT E) (CR EBU) |
| Black | 0 | 0 | 0 | 3.2 3.2 | .3128 | .3292 | (D65) |

③ Tolerances: Given measured x_m, y_m ; target x, y :

compute $u_m' = 4x_m / (3 + 12y_m - 2x_m)$

~~u'~~ $u' = 4x / (3 + 12y - 2x)$

$v_m' = 9y_m / (3 + 12y_m - 2x_m)$

$v' = 9y / (3 + 12y - 2x)$

$\Delta u'v' = \sqrt{(u_m' - u')^2 + (v_m' - v')^2}$

confirm that $\Delta u'v' \lesssim 0.04$

confirm that luminance is within tolerance: $\Delta L/L = |L_m - L|/L = 0.1$

④ Report Make and model of display under test, ~~all~~

measured values, and $\Delta u'v'$, $\Delta L/L$.

* SMPTE and EBU primaries differ by very little; i.e., by less than .005.