Addendum to ColorFlex EZ User's Manual

Description

This CMR adds the Rd, a, b color scale as a selectable option in CFEZ firmware.

Between 1943 and 1967 Richard Hunter attempted to change the CIE X, Y, Z color scale into a form that better facilitated communication while incorporating the human vision concept of opponency. It took him three attempts.

The first was the Rd, a, b scale developed for C/2 conditions in 1943. Rd is the same as Y Brightness which corresponds to average reflectance. The "a" & "b" are aRd and bRd and while they represented an early redness-greenness and blueness-yellowness, they are not the same calculation as the current Hunter a and b or CIE a* and b* color values.

The Rd value of this scale used most often as a single-value overall brightness or reflectance for loose, neutral-color limestone-based powders. The Y value could be used instead as they are identical, but some industries become familiar with particular metrics and retain them to report the color quality of their products. In addition, the bRd is sometimes used to indicate iron contamination of limestone based powders.

In general, better color quality limestone powder is associated with a higher Rd value and an bRd close to 0.

Formula:

Rd = Y

a = 1.75 fY (1.02 X - Y)

b = 0.70 fY (Y - 0.8467 Z)

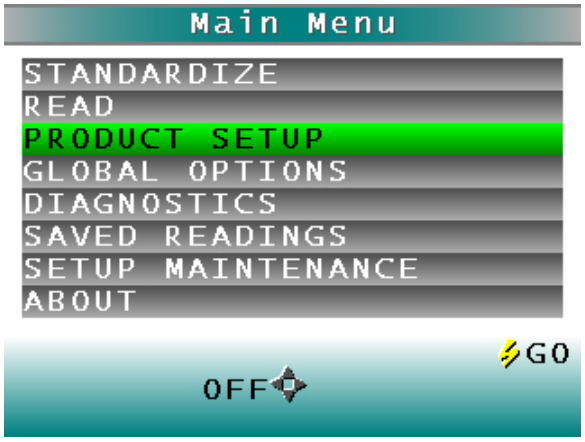
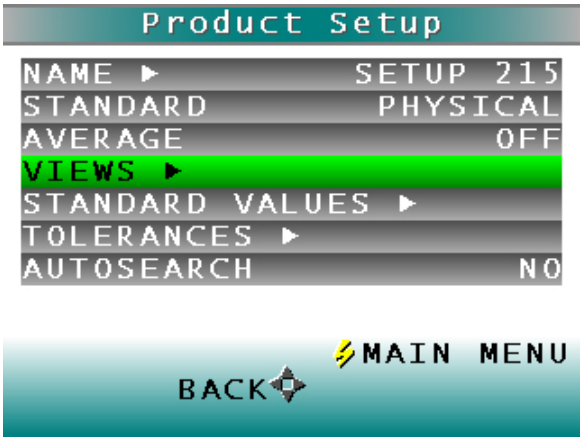
where: conditions are 2/C.
X Y Z are CIE tristimulus values
fY = (53.55 + 0.51 Y)/(5 + Y)

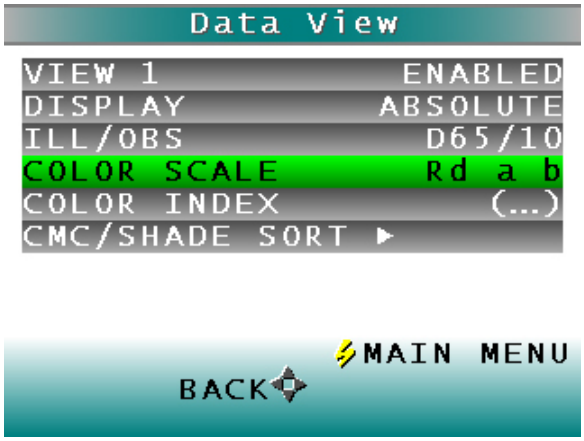
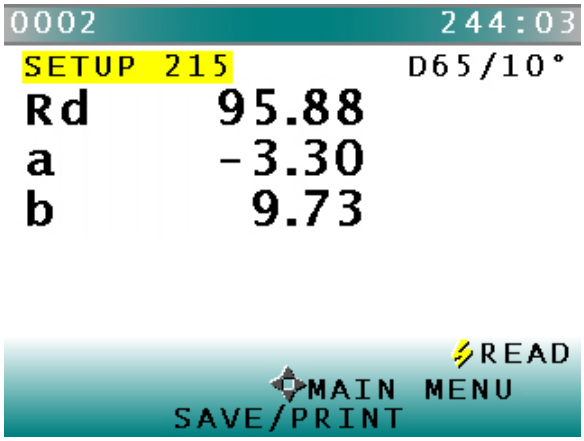
Rd a b was developed under C/2 conditions but can be used with other illuminant/observer combinations.

Installation

The special CMR-3122 firmware for the CFEZ will be installed at the factory.

Operation

From the Main Menu, select a Product Setup to modify.	
With a Product Setup, enable a View.	

Within that View, navigate to the Color Scales and select “Rd a b” color scale using the right or left arrows to display as an “Absolute” values.	
Once chosen, Rd a b will display in the measurement screen and be calculated using the formula above.	
If “Differences” are chosen as the Display option, the values will be displayed as differences from a Physical or Working Standard.