

Operating manual DigiDens T6CR



The **DigiDens T6CR** is a robust and precise universal densitometer for transparent b/w-film and colour control fields on reflection media. With these capabilities it is perfect for the reproduction field and printing houses. Due to its latest sensor and microprocessor technology it is small and handy in size, exceptional in precision and very easy to use. You will find more technical data at the end of this manual.

The DigiDens T6CR possesses the following important elements:

- **3 Pushbuttons M, C, P,**
- **16-digit LCD-display,**
- **Lightsensor,**
- **Battery case for 3 mignon cells**

In both modes (reflection and transmission) push-button M, C and P, are used for 2 functions each. The second function is initiated by pressing the button for a longer period of time (>4 seconds). Pressing the red pushbutton **P** (power) switches between colour reflection ('**R**') and transmission ('**T**'). The second function of the red pushbutton **P** switches the device on or off.

The center button **C** (calibrate) calibrates the device. Second function is the menu mode to modify some parameters.

Pressing button **M** (measure) initiates the measuring process. Second function is the switch to continuous mode (measuring continuously) in transparent mode and to store a reference colour

in colour reflection mode..

The measured value and the parameter modification is displayed on the 16-digit LCD-display.

The precise state of the art light sensor measures densities up to over density 6 in the transmission mode. The strong and constant reflection colour light sources allow measurements up to more than density 2.5 in colour reflection mode. The accuracy of the measurements is excellent.

The device switches off automatically, if no button is pressed within 10 minutes. This feature helps minimizing battery consumption. The power source are 3 mignon cells (batteries or accumulators).

The operating procedure in transmission mode is different from the operating procedure in colour reflection mode. For that reason the following description on this page describes the transmission mode only. You find the description of the colour reflection mode on the backside of this leaflet.

Transmission mode:

The functions in details:

Button P:

The DigiDens T6CR is switched on with this button. If you switch on the device, you first will see the indication '**Wait**' to hold the button. If you release the button before the display switches to '**DigiDens Cal**', the device switches off (to prevent the device from being switched on accidentally). Right to the '**Wait**' you find the version number of the software (e.g. V5.1). Now the device is ready to use.

If the device is currently in the colour reflection mode state, press the button P until you see 'Cal T' on the display, indicating that the device is now in transmission mode (to measure transparent films)

(If you want to switch to colour reflection mode and the device is currently in this transmission mode state, press the button P shortly.

In this case see further information on the back of this page)

The switch off is also done with this button. Keeping the button pressed, (finally) leads to '**Down**'. Now you can release the button and the device is switched off.

Button C:

With this center button **C** the calibration is done. The second function is the menu function to modify some parameters...

Calibration for the transmission mode 'T':

Mark a bright area of your light table with a circle as a measuring area. Inside this circle you do your calibration. Make sure, that '**DigiDens**' is in transmission mode '**T**'. Position the measuring spot of '**DigiDens**' onto clear film on the marked measuring area. Press button **C** for less than 3 seconds to calibrate. Now the calibration is done.

Menu modes:

If you hold the button **C** for longer than 4 seconds, the menu mode is initiated. This mode enables the user to modify some parameters. The first step is

DotGain (Soft Dot):

You see '**DotGain**' followed by '**T**' or '**R**' on the display (depending in which mode you currently are) and the percentage of Dotgain for the middle tones (around 50%). Factory setting is 0.0%. With button **M** you can increase this value in steps of 0.5%. With button **P** you can decrease this value in steps of 0.5%.

Sens in transmission mode T (Version 3.0):

The Sens parameter varies the sensitivity. The value is adjustable between 1 and 40. The factory setting is individual to the sensor (see battery cover inside). You also may use this feature to adjust to different light tables. There is the relation: Increasing sensitivity results in falling accuracy. Increase this value only if you need to read very high densities. The brighter your light source, the wider the density range (the better).

Pressing button **C** again leads to the next parameter (step3) **Slope adjustment:**

The slope adjustment feature enables the user to adjust the density of '**DigiDens**' to another densitometer. Despite the precision of '**DigiDens**', there might be a need to vary the density values slightly for compatibility purposes. The slope value can be varied between 1 and 200. The factory setting is 100, which means original slope. With button **M** you can increase the slope, each step increases the density about 0.33% (e.g. density 3.00 is increased to 3.01 by one step).

With button **P** you can decrease the slope in the same way.

Pressing button **C** again leads to the next parameter (step4) **Display (only valid for transmission mode):**

This parameter varies the display of the measured values.

The values 1 to 7 represent

1. show density and percentage, density first
 2. show percentage and density, percentage first
 3. show percentage only
 4. show density only
 5. like 1, percentage for negative measurement
 6. like 2, percentage for negative measurement
 7. like 3, percentage for negative measurement
- Factory setting is value 1. With button **M** you can increment this value, button **P** decrements this value.

Pressing the button **C** for a longer period of time (>4 seconds) leaves the menu mode and saves the current parameters (you see '**Save**' on the display). If you want to leave the menu mode without saving the parameters, switch off the device by pressing button **P** for a longer period of time until you see '**Down**' on the display.

Button M:

This button is the measuring button. In the measuring mode (not menu mode, where button **M** is the increment button) button **M** initiates the measuring process. It might take 1 to maximum 8 seconds until the new values appear on the display. During this time a '**w**' for wait overloads the mode letter '**T**' to indicate, that the measuring process is in progress. Coming close to the sensitivity limit of the DigiDens T6CR displays a > to indicate, that the density may be higher than displayed.

The longer periods between 2 and 8 seconds only will appear in very dark areas (e.g densities over 4) and only in transmission mode. Pressing the button **M** for a longer period of time will switch to continuous mode (only in transmission mode). In this mode the '**DigiDens**' measures continuously without the need to press button **M** for every measurement. To leave the continuous mode, press any button within this mode.

The 16 digits of the LCD-display allow a guided and simple operation of '**DigiDens T6CR**'. The density is leaded by the letter '**D**', the percentage is trailed by the symbol '%'. The rightmost letter is the mode letter '**T**' for transmission.

The continuous mode is indicated by a 'c' left to the mode symbol. If the batteries go low, an indication '**e**' for empty will be seen. If you want the default parameters (factory settings) reactivated, then with button **P** you have to press button **M** and **C** simultaneously when switching on the device until '**DigiDens Cal**' shows an additional '**r**' for reset. This lasts about 15 seconds.

Technical data:

- density max transmission > 6 D
- identical to > 120 dB
- deviation density trans. (D<5) +- 0,02 D
- deviation percentage trans. +- 0,5 %
- density reflection > 2.5 D
- dev. colour density reflection +- 0,02 D
- dev. colour percentage refl. +- 1 %
- about 200 000 measurements transmission
- 50 000 measurements reflection with 1 set of batteries (or accus)
- Input voltage 2.8 - 5.0 volts
- 3 x 1,5 Volt Mignon batteries
- or
- 3 x 1,2 Volt Mignon accus
- measuring spot diameter 2,5 mm

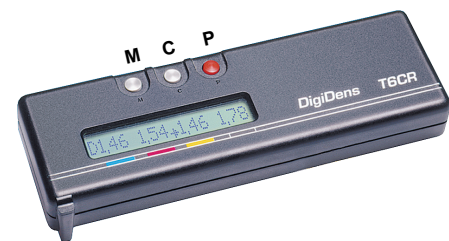
To change batteries, open the battery case by unscrewing the battery cover. Please place the batteries carefully in the right direction (as shown by the battery symbols) into the battery case.

To let the device always supply reliable values, keep the area around the measuring spot clean. To avoid unwanted infrared influence (in density ranges higher than 5 is some despite the IR-blocking filter), follow this advice: Don't expose your DigiDens T6CR to heat and in particular: **don't leave the DigiDens T6CR and the films you want to measure on the light table while not using.** **Measuring on a light table means relying on the light source of this table. Check from time to time if the light source is still stable.**

The power source (batteries or accumulators) should be checked from time to time. Beside cleaning frequently, no further maintenance is necessary. The internal colour light sources are maintenance free.

This product is subject to change without notice
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Operating manual DigiDens T6CR
Colour reflection mode:



In colour reflection mode you can measure densities and percentages of colour control fields on reflective media.

If the display shows 'DigiDens Cal CR' after switching on, the colour reflection mode is already active. If the device is in transmission mode after switching on (this depends on the mode, which has been active when switching off the device the last time), press button P to enter the colour reflection mode ('Cal CR' on the display). In this mode 3 specific colour light sources (filter behaviour like Kodak Wratten Tricolor Filters) are switched on separately and the light sensor examines the remission.

The DigiDens T6CR possesses the following important elements:

- **3 Pushbuttons M, C, P,**
- **16-digit LCD-display,**
- **sensor head with 3 colour light sources and light sensor,**
- **Battery case for 3 mignon cells**

The three pushbuttons M, C and P are used for 2 functions each. **The second function is initiated by pressing the button for a longer period of time (>4 seconds).**

Pressing the red pushbutton **P** (power) switches between the 5 different display modes. Second function is the switch to Transmission ('T'). Switching off the device needs to press button 'P' even longer.

The center button **C** (calibrate) calibrates the device. Second function is the menu mode to

modify some parameters.

Pressing button **M** (measure) initiates the measuring process, the second function stores the measured value as a reference. **For display mode 1, 2 and 4 only the dominant colour separation component of the reference is stored (So you can have 4 references for the four separation colours). For display mode 3 and 5 the complete colour with its 4 separation components is stored.**

The measured value and the parameter modification is displayed on the 16-digit LCD-display.

You find the four values for cyan, magenta, yellow and black next to each other on the display. Densities are displayed with two fraction digits, percentages are displayed without fraction part.

There are 5 display modes:

1. Maximum display densities:
after a measurement and always after calibration (zero adjustment) only the colour with the maximum (dominant) value is changed in the display. This value is indicated with a leading arrow.

This mode is suitable for measuring colour control fields of pure printing inks, because values of other separations are left unchanged in the display.

2. Maximum display percentage:

The percentage of the dominant separation colour is displayed, the values of the other separations are left unchanged. Percentages only can be measured after solid colour calibration of this separation and only on pure separation colours (control wedges).

3. All separation Display:

In this display mode all separation components of the measured colour are displayed. Attention: Even pure separation inks do contain components of other separation colours (e.g. magenta ink also contains yellow and cyan).

4. Differential display (to reference):

In this mode the difference of the dominant separation to the reference colour component is displayed. The display of the other separati-

ons is left unchanged. The differences are always displayed with its sign. After each white calibration, the absolute values of all reference colour components are displayed.

5. Display of weighted distance in RGB-colour space:

In a multi dimensional colour space every colour has its unique position. Two colours do have a distance value, which depends on the similarity of this two colours. The more similar this colours are, the smaller the distance. This display mode calculates in CIE-Lab and the distance is delta E. Also a + or - is displayed behind the distance value, which indicates, if the currently measured colour is darker (+) or brighter (-) than the reference (luminance indicator).

Pressing the button 'P' shortly, switches between the 5 display modes.

The functions in details:

Button P:

The DigiDens T6R is switched on with this button. If you switch on the device, you first will see the indication 'Wait' to hold the button. On the right of 'Wait' you find the version number of the software (e.g. V5.R). If you release the button before the display switches to 'DigiDens Cal', the device switches off (to prevent the device from being switched on accidentally). **Now the device is ready and it should be calibrated for the mode you want to use it (here 'CR').** The switch between the 5 display modes also is done with this button.

Holding the button for about 4 seconds leads to the transparent mode ('T'), if currently in colour reflection mode. To switch off the device, press this button 'P' even longer, until you see 'Down'. Now you can release the button and the device is switched off. There is no real need to switch off the device manually (whenever no measurement is done, the device runs in low energy stand by and switches off automatically after about 8 minutes).

Button C:

With this center button **C** the white and solid colour calibration is done. **The white calibration is valid for all 4 separation colours. The solid colour calibration must be done separately for**

every separation colour !

The second function is the menu function to modify some parameters...

Calibration for the reflection mode 'CR':

Make sure, your densitometer is in colour reflection mode 'CR'. Position the measuring head above your white, then press button 'C'. The white alignment is done, the display shows density 0,00 for every separation and the arrow points to black as a default. Now you calibrate the solid separation colours: Place the measuring head on a solid separation colour and press button 'C' again. Now the white calibration value is referenced as 0%. The solid colour value is referenced as 100%. **Only for the separation colours which have been 'solid colour calibrated', percentage measurements are possible.** The other separations permanently show 0%.

Now the calibration is finished. If white is interpreted as solid colour (wrong handling, very few cases), switch to transparent mode with the button P and back to colour reflection mode to reset the calibration. A new calibration of white invalidates the old solid colour calibration too.

Menu modes:

If you hold the button **C** for longer than 4 seconds, the menu mode is initiated. This mode enables the user to modify some parameters. The first step is

DotGain (Soft Dot):

You see 'DotGain' here followed by a 'R' and the percentage of Dotgain for the middle tones (around 50%) on the display. Factory setting is 0.0%. With button **M** you can increase this value in steps of 0.5%. With button **P** you can decrease this value in steps of 0.5%. The DotGain value is valid for all 4 separations.

Pressing button **C** switches to the next parameter (step2) **Select**. The Select can be modified by pressing the M (forward) or P (backward) button. Select A=Autoselect (factory setting) or the individual colors (C,M,Y,K) here.

For negative printing plate-measurements you can use the next select Neg. The select Abs stand for absolute densities and can only be used, if you also ordered a reference white ceramic tile (rarely used)

Pressing button C switches to the 4 colour-individual **Yule Nielsen Factors** (an improved and generalized variant of the Murray-Davies formula)

for percentage measurements. This formula allows the variation of paper and ink parameters. The parameter varies from 0.6 up to 3.0. Factory setting is the medium value 1.2. Choosing the right parameter needs some experiments in the beginning (Smaller values increase the mid tone percentage values).

Pressing button **C** again leads to the next parameter (step3) **Slope adjustment:**

The slope adjustment is also separate for the four colour separations. This feature enables the user to adjust the density of 'DigiDens' to another densitometer. Despite the precision of 'DigiDens', there might be a need to vary the density values slightly for compatibility purposes. The slope value can be varied between 1 and 200. The factory setting is 100, which means original slope.

With button **M** you can increase the slope, each step increases the density about 0.5% (e.g. density 2.00 is increased to 2.01 by one step). With button **P** you can decrease the slope in the same way.

Service parameters (factory settings):

some parameters only can be changed when the unit is started in the reset mode (pressing button M with button P simultaneously, when switching on). Then you have access to parameters you better only change with factory guidance.

The 3 internal Slope1 parameters change the responding curve. The next 3 internal Slope2 parameters do the same as the external slope. The following 3 color parameter influence the filter behaviour of the instrument.

The next 3 WT (White Threshold) parameters decide when to interpret white and when to interpret solid colour while calibrating.

With these service parameters component variations of the densitometers are balanced.

Pressing the button **C** for a longer period of time (>4 seconds) leaves the menu mode and saves the current parameters (you see 'Save' on the display). If you want to leave the menu mode without saving the parameters, switch off the device by pressing button **P** until you see 'Down'.

Button M:

This button is the measuring button. In the measuring mode (not menu mode, where button **M** is the increment button) button **M** initiates the

measuring process. During this time a 'w' for wait is displayed on the display in the first digit to indicate, that the measuring process is in progress. After the measurement the first digit shows a 'D' in display mode 1 and 3, a % in display mode 2. **You can store a measured value as a reference by holding the button M for a longer period of time (about 4 seconds) until the leading digit shows a 'R'.**

For display mode 1, 2 and 4 only the dominant separation of the reference is stored and for display mode 3 and 5 all color components of the measured value are stored. Reference colours are needed for the difference calculation in display mode 4 and delta E calculation in display mode 5.