

Color densitometer
Chameleon advanced

Operation manual

GraphicMenue The **GraphicMenue** enables very fast and efficient working. Nearly all functions of the **Chameleon** may be selected only with a single click of **cal** on the appropriate color pad, without any nasty menue navigation!

Switch on Click **start** to activate unit. Last value is indicated.

Switch off If densitometer was not in use for more than one minute, it turns off automatically.

Measure Click **start**. Hold **start**: the current operating mode is indicated. Example:



Calibration paper white Only on white paper and only in density mode ("dEn")! Hold **cal** for approx 2 sec until only decimal points remain visible. Zero function is retarded to prevent erroneous triggering



Density Click **mode**: The display toggles between the preset function, e.g. dot, and density reading.



Higher resolution of 0.001 for D < 1.00 available (optional).

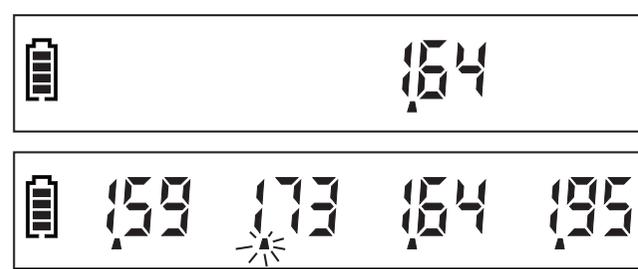


Select color Hold **color**: The color groups are displayed in the following sequence: den 4c¹⁾ → All²⁾ → den S1..S4³⁾. After releasing the button, the last mode indicated will be saved.

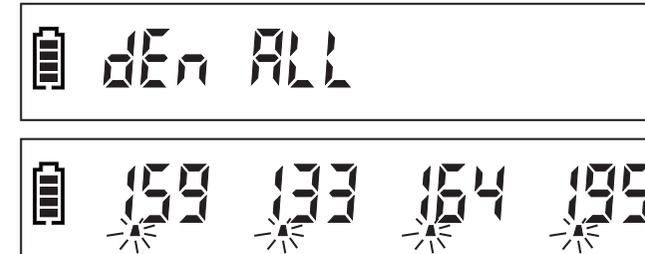
1) Density of the process color

Click **color**: the sequence of display will be as follows:
 c → m → y → k → auto 4c. Example: y

auto 4c = automatic color select; last reading is indicated by a flashing decimal point.



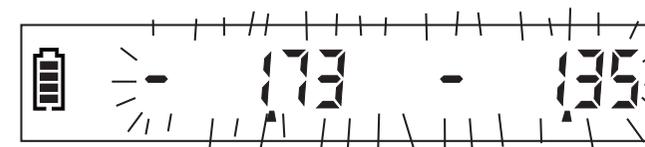
- 2) **ALL**: 4 colors of a reading are displayed simultaneously (e.g. to check the color of the ink). Mode is indicated by the flashing decimal points. Not possible in dot mode and in combination with special color mode.
 Return to den 4c: Click **color**.



- 3) Density of the special color (Pantone, HKS).
 The sequence of display will be as follows:
 S1 → S2 → S3 → S4 → auto S.
 auto S = automatic color select; last reading is indicated by a flashing decimal point.



Besides indication of the appropriate icons den S1...S4, resp. dot S1...S4 during reading operation, the display blinks at a rate of 1 second to identify special colors.
 Example: 2 special colors are allocated to S2 and S4. Memory cells S1 and S3 are free.
 See also: "Save special colors" and "Delete special colors"



Functions

Hold **mode**: modes are displayed in the following sequences:
dot¹⁾ → dotGn 25-50-75²⁾ → dotGn 40-80²⁾ → dotGn 60³⁾ →
bAL⁴⁾ → trP⁵⁾. After releasing the button, the last mode indicated will be saved.

- 1) see "Dot area"
- 2) see "Dot Gain"
- 3) see "Change dot reference"
- 4) see "Grey balance"
- 5) see "Trapping"

 dot	1)
 dotGn 25-50-75	2)
 dotGn 40-80	2)
 dotGn 60	3)
 bAL	4)
 trP	5)

Dot Area

Procedure:

- 1) Read solid color density. Example: D = 1,59.
- 2) Select: dot (see: "Functions"). Solid color stands for 100%
- 3) Read dot value

Reading is only possible if at least one solid color with a minimum density of D = 0.25 has been previously read. If density falls below D = 0.50, an acoustic signal appears. Dot measurement values are calculated according to Murray Davies.

Example: 40% cyan dot area has been read, result: 49% (corresponds to dot gain = 9%).

 159	1)
 100	2)
 49	3)

Dot gain

Select: dotGn (dot gain). There are the following 3 options (see „functions“). example: dotGn 40-80



- 1) Dot Gain dotGn 25-50-75 % and
- 2) Dot Gain dotGn 40-80 % is preset and cannot be varied.
- 3) Dot Gain 60%: customized dot reference can be varied by user as needed. See: “change dot reference”

After selection of the dot reference, the next steps are marked by flashing figures. The display shows the solid color to be measured and the selected dot reference (e.g. dot gain 40-80%):

- 1) Read solid color, e.g. D = 1,59.
- 2) Read first dot area, dot gain is 9%.
- 3) Read second dot area, dot gain is 7%.
- 4) Read third dot area, if applicable.
- 5) New reading cycle: Select next ink zone or next color, click **start** and repeat steps 1) through 4).



An acoustic signal appears in case of an operating error (e.g. in case of negative dot gain).

For dot readings to be repeated, a new measurement cycle beginning with a solid color measurement must be initiated.

Grey balance Color balance

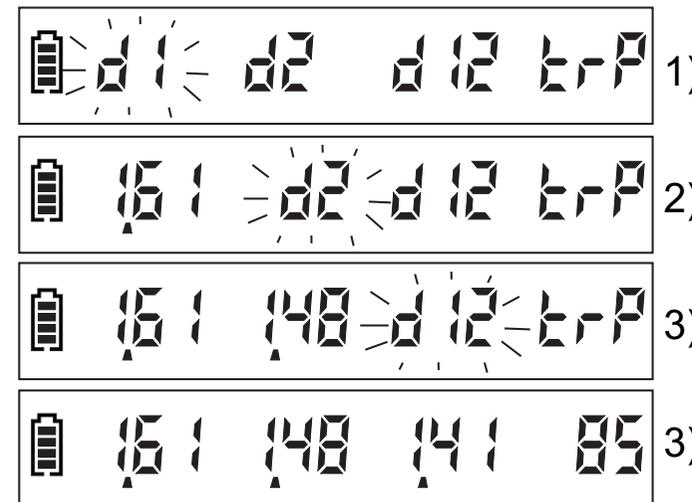
Select: bAL. If you measure the 3 solid process colors c, m, y (no special colors!) and then switch to bAL, the result will be the grey balance. If only 2 solid process colors have been measured before, the result will be the color balance. Example: color balance cyan + yellow.



Trapping

Select: trP. The next steps are marked by flashing figures:

- 1) Read the first printed color D1.
- 2) Read the second printed color D2.
- 3) Read the overprint color D12, the trapping value will be indicated in % according to Preucil.
- 4) New reading cycle: click Start and repeat steps 1) through 3).



Save special colors

To enable the densitometer to identify special colors (Pantone, HKS), appropriate reference colors must be saved.

- 1) Calibrate on paper white
- 2) Select free memory cell S1-S4 with Free space is indicated by a hyphen. Example: S1 was selected. If no memory cell is available, delete any special color cell first (see "Delete special color").
- 3) The first reading is specified as reference value, all further readings will refer to this value.
- 4) To terminate special color saving: Got to automatic mode (auto 4c or auto S).



The user may define any individual special colors and keep them in a dry and dark place together with the calibration chart.

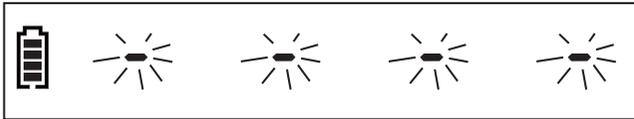
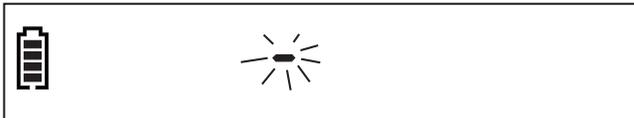
Measure special colors

Identified special colors are automatically assigned to the associated memories; a blinking display signals correct assignment.
Special colors not identified are assigned to the process color memory auto 4c (no blinking display).

Delete special colors

Select color to be deleted. Hold  for approx. 5 sec, clr-symbol (clear) appears, and the selected special color memory will be deleted.
Example: S2 was deleted.

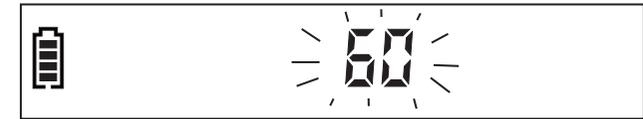
All special colors are deleted if the **Chameleon** is in “autoS” mode



Change dot reference

- 1) Select customized dot reference (see “Dot Gain”).
- 2) Press **cal** + **start** simultaneously for approx. 2 sec until display flashes.
Click **mode**(+) or **cal**(-) until the correct reference value appears (10 - 90%).
- 3) Alternative to 2): Set measuring head on the center of the color gradient of the calibration chart, hold **cal** and move head up(+) or down(-) until correct reference value appears on the display.
- 4) To confirm new dot reference: Take any measurement.

The preset dot references “25-50-75%” and “40-80%” cannot be varied!



Calibration

- 1) Set to zero on white pad “Zero cal” of the calibration chart.
- 2) Read all colors to be calibrated (auto 4c or auto S).
- 3) Press **cal** + **start** simultaneously for approx. 2 sec until CAL appears.. Select color with **color**.
Click **mode** (+) or **cal** (-) to adjust reference value.



If reference values are too high or too low, an acoustic signal appears or values are blocked.



- 4) Alternative to 3): Select color (via or **Graphic-Menue**) Set measuring head on the center of the color gradient of the calibration chart, hold **cal** and move head up(+) or down(-) until correct reference value appears on the display.
- 5) To confirm calibration: Take any measurement.
- 6) Abort calibration: Press **cal** + **start** simultaneously for approx. 2 sec.

The CalibrationChart has to be replaced every 24 months.

The chart should show no damages or scratches and has to be stored in a dry and dark place.

Fix here a new calibration chart

Data transmission Start (Record job) and stop (End job) data recording with **GraphicMenue** (optional).

Power supply The unit is equipped with a high quality 9V alkaline battery.

Thanks to the latest power save circuitry up to 1.000.000 readings can be taken before the battery is exhausted.

To change battery, simply remove the body screw.

Please make sure to observe the applicable national regulations for the disposal of exhausted batteries.

Information on your special colors

S1		Attach sample here
S2		Attach sample here
S3		Attach sample here
S4		Attach sample here

Errors

Set zero on paper white only



Function executable only in density mode



At least one solid color with a minimum of D = 0.50 is required



At least 2 solid cmy-colors with a minimum of D = 0.5 are required (no special colors!)



At least one solid color in the D = 0.50 to D = 2.20 range is required for calibration



Trapping Error: Colors in trapping mode have been combined falsley



Change battery, approx. 50 readings left before break-down. Double beep: battery discharged, only few readings left



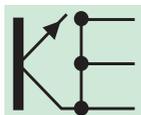
Hint

Major operating errors during the calibration procedure may lead to false calibration factors and create very high density values. If calibration is impossible, hold **cal** until "CAL rES no YES" appears. Click **start** (yes) and repeat calibration.



Technical specifications

Type	Chameleon advanced
Functions	Density Dot Area (0-100%) Dot gain (25-50-75%, 40-80% and customized) Gray balance, color balance Trapping
Color select	automatic or manual, process colors and 4 special colors
Range	0-2.70 D Resolution 0.001 up to D = 1.0 (optional)
Precision	±0.01 D, ±1%
Linearity	±0.01 D, ±1%
Inter instrument agreement	±0.02 D, ±2%
Light Source	LED
Data transmission	Wireless USB (optional)
Infrared-Sensitivity	none
Measuring Speed	0.3 sec
Polarization Filter	2x linear (standard)
Geometry	0/45° (according to DIN 16536)
Mesuring Area	3 mm Ø° (according to DIN 16536)
Display	LCD, 15 characters
Power Source	9V alkaline battery 6LR61
Battery capacity	up to 1.000.000 measurements
Dimensions	LWH 206x34x42 mm
Weight	150 g
Accessories	Operation instructions, case, calibration chart, GraphicMenu



Köth Elektronik Inh. Hans-Peter Nickel
Im Lichtenholz 19
D-35043 Marburg

E-mail: info@koeth.de
Website: www.koeth.de

Tel.: +49 (0)6421 1864278
FAX: +49 (0)6421 1864279