

# BetaColor S2 XPress



DENSITY



DOT GAIN



DOT AREA

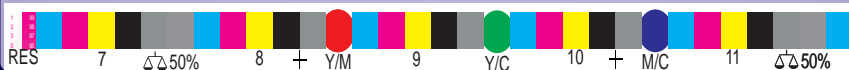


UPGRADEABLE



Instruction Manual

Ver 01.03b



<b>Table of Contents</b> .....	Version01.03b
Components and Controls .....	4
Getting Started, Touchmatic Memory .....	5
Red, Green Traffic Lights. Zero to Paper.....	6
Measure Density.....	7
Measure a Dot Gain Target.....	7
Factory Settings. Customizing the Settings .....	8
Edit Density and Tolerances.....	9
Edit Dot % Dot Gain Targets and Tolerances .....	10
Automatically Enter Dot Gains .....	11
Beta Color Viewer for Subjective Evaluation .....	12
Automatic Mode Settings, Auto Paper Zero Modes .....	13
Absolute Density, Dot Gain, Color Select.....	14
Measure Dot Area 1% to 99% .....	15
Manual Color Select .....	16
Special Functions, Slope Control .....	17
Slope Control Calibrations .....	18
Setting Absolute Zero .....	19
Changing Batteries .....	20
Technical Specifications .....	20
Warranty .....	21
Press Kits .....	22
Eye Scan XPress .....	23
Print Characterization Chart.....	24

# Components and Controls

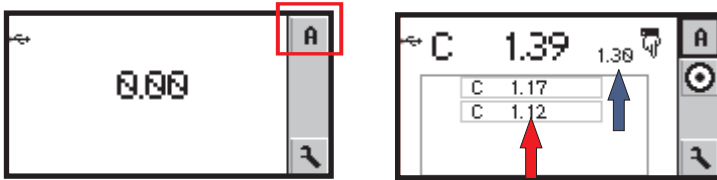


**UPGRADEABLE TO S4 XPRESS**

## Getting Started With “Touchmatic Memory”

The S2 XPress is always ready to use. There is no need to charge it, plug it in, or connect cables. It will produce more than 500,000 measurements with 2-AA alkaline batteries, and turn itself off after the last measurement.

The top Icon in the **Vertical Tool Bar** indicates you can automatically perform the following functions.



- 1.Zero to the paper.
- 2.Measure **Density** of the primary colors, yellow, magenta, cyan, and black.
- 3.Measure 2 **Dot Gain** values in each primary color.



2.Density

3. Dot Gain

4. Dot Area

**Density, and Dot Gain** targets can be readily memorized for each new print run from the opening screen by measuring a target, then framing the **Bulls Eye** with the up or down keys and storing it in the “**Touchmatic Memory**” by pressing **ENTER** with the middle key. For example, the first **CYAN** [C] ink 1.30 Density was measured and memorized. The next **CYAN** measurement 1.39 Density is indicated by the large numbers. The **BLUE** pointer indicates that the first Cyan 1.30 Density will serve as a reminder for all subsequent CYAN measurements until it is changed if necessary. Up to 4 previous measurement appear in the history stack as indicated by the **RED** pointer. The down pointing icon indicates the 1.39 Density is high.

## Getting Started



Flashing **Red** or **Green Traffic Lights** indicate when the **Density, and Dot Gains**, are in or out of tolerance. This feature allows the fastest and most accurate measurements possible without the need to constantly look at the numerical display.

**Note: A color bar with targets of Density, Dot Gain, Gray Balance, and Trap Colors is essential.**

We highly recommend the Beta Custom Gray Balance Color Bar for accuracy, speed and features.

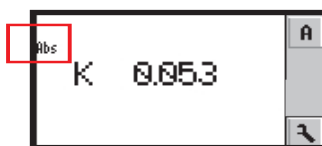


Zero to Paper in **RELATIVE** or **ABSOLUTE** Density  
Place the aperture on white paper and press the head down.  
Rezero on paper any time if in doubt of the zero value or when changing paper.

Measurements can be done in **RELATIVE DENSITY** that produces a 0.000D with paper for any density up to 0.14D, or in **ABSOLUTE DENSITY** that will show an average white paper range between 0.04 to 0.09D. For example, the display shows a Black Density of 0.053. On the left side of the display is the **Abs** symbol as a reminder.



RELATIVE



ABSOLUTE

## Getting Started



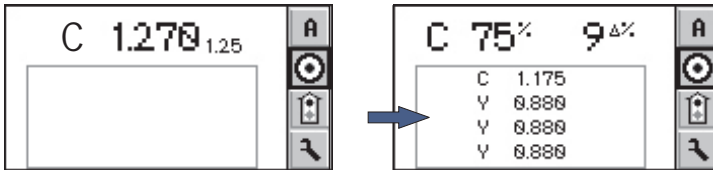
### Measure Density

Place the aperture on a solid color of cyan, magenta, yellow, or black and press the head down. The large **C** in this example shows you've measured a Cyan target. Continue with the other colors in any order.

Up to 4 previous measurements are saved in a **history stack** beneath the current measurement. (Blue Arrow)

The last measurement as illustrated was the Cyan target.

After measuring any solid color patch the DOT GAIN targets of the same color can be automatically measured. The S2 XPress is pre loaded with Dot Gain Targets of **75%**, and **50%**, to correlate with the **Beta Custom Color Bar**. The Dot Gain targets can be changed to other values if needed.




### Measure Dot Gain Targets



If the last solid color measurement is **Cyan**, we can now measure **Cyan Dot Gain Targets**. Place the aperture on the Dot Gain Target and press the head down. In this example the C indicates you've measured the **Cyan Dot Gain Target**. The 75% indicates which of the three Dot Gain Targets you've measured. The 9?% is the result of the Dot Gain Calculation. [Murray/Davies equation, which calculates the actual dot size plus optical dot gain]

?% means **CHANGE IN PERCENT**. The 75% Target is actually 84% total Dot Area. In this example the Cyan Dot Gain Target has 9 points of dot gain. Continue measuring the 2 other Cyan Dot Gain Targets.

The Dot Gain values can be memorized by framing the Target  icon and pressing **Enter**.

**Note:** To restore Factory Settings, press the **RED** button on the bottom of the S2 XPress. Select the Factory Tool [blue pointer] on the top of the **Vertical Tool Bar** and press **ENTER** to restore the original Factory Settings.

**Caution: Restoring Factory Settings will remove your custom settings.**

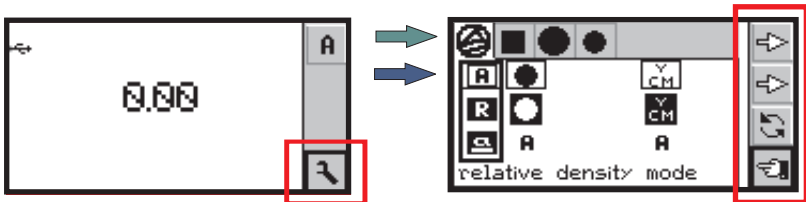
To return to programs without making any changes, frame the **Go Back** symbol and press Enter or Zero to paper. The **USB** symbol appears when the densitometer is connected to your computer.



References are accessed by framing any Reference icon and then **Framing** the Change Tool and pressing **ENTER**. Each **Reference** can memorize its own set of **DENSITY**, **DOT GAINS**, and **TOLERANCES** values.


## Customizing the Settings



The BetaColor S2 XPress is extremely flexible and easily adapted to your shop standards. Icons are used to navigate through the groups of setting and adjustments. Frame the **Tool Icon** on the **VERTICAL TOOL BAR** to open the References and Tolerances.

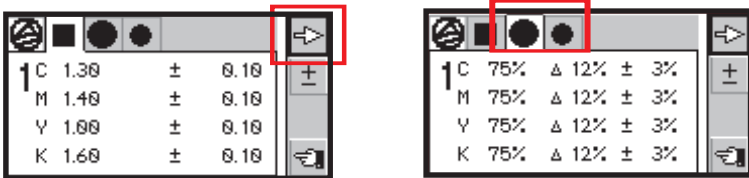


1. Vertical Tool Bar Settings. [In red rectangle]
2. References and Tolerances Settings. [Green arrow]
3. Automatic Mode Settings. [Blue arrow]

# Edit Density and Tolerances

Press the up or down Keys to frame the top arrow . Press **ENTER** to open the **Solid Density Reference and Tolerance field**. The **DENSITY** values displayed will be either the installed pre loaded values, or new values that were measured and memorized using the **BULLS EYE**  function. Framing the top arrow and pressing **ENTER** will open the edit program for **DENSITY** values and the +/- tolerances. To change any other **Density** values and **Tolerances**, frame the top arrow and press **ENTER** to proceed to each value and repeat as necessary.


Note: The **DENSITY** values will change each time you enter new values in any of the 4 References using the **BULLS EYE**  function. To proceed to the next editable values it is necessary to exit the program by framing the **RETURN**  **KEY** and press **ENTER**.



# Edit the Dot Gain and Tolerances

Press the up or down Keys to frame the top arrow and press **ENTER**. The **DOT GAIN EDIT** screen will appear. There are 2 DOT GAIN values that can be programmed.

The **S2 XPress** is generally set at 75%, and 50%, to agree with the **Beta Custom Color Bar**.

In the example above, the first Dot percent is 75%. The Dot Gain increase is set at 12% or can be actually measured and memorized with the Bulls Eye.  The **+/- Tolerance** is set at 3%. Measurements within Tolerance will flash **GREEN**.

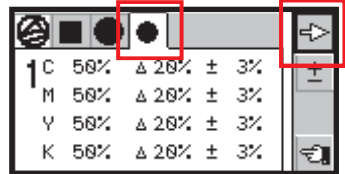


## Edit Dot %, Dot Gain Targets & Tolerances

**DOT PERCENTAGES** from 80% to 25%, plus **DOT GAINS** and **TOLERANCES** can be changed by framing the top arrow on the vertical tool bar and pressing ENTER. Press ENTER again to frame the appropriate DOT icon for adjusting. Frame the  $\pm$  and press ENTER. The DOT % for CYAN will enlarge and a separate + and - symbol will show.

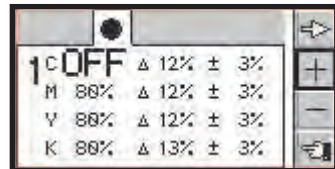
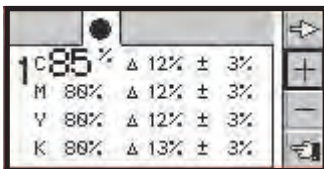
Frame the + or - symbol to change the **DOT %** value if necessary.

To continue editing, frame the top arrow and adjust the **DOT GAIN** if necessary. Repeat the procedure for the **TOLERANCE +/-** values.








The magenta, yellow and black values can be similarly adjusted. To proceed to the next set of editable values it is necessary to frame the **RETURN KEY** and press **ENTER**.

**NOTE:** The automatic **DOT GAIN** function relies on the principle that measuring a solid ink patch results in a density measurement which then can compare it to a 3/4, 1/2 or 1/4 tone tint value. Under ordinary press conditions a logical DOT GAIN value is displayed. If an illogical result is displayed, it is the result of the solid or tint values beyond normal tolerance values. This may happen when the first measured solid density patch is significantly higher in density than subsequent measurements causing a false 3/4 tone DOT GAIN result in error. In this event, re-zero to paper and measure the solid again. All DOT GAIN measurements should be made as close as possible to a solid of the same color tint to minimize errors. To change the 3/4 tone value to **OFF** press the  $\pm$  icon beyond 85% to show Density only.



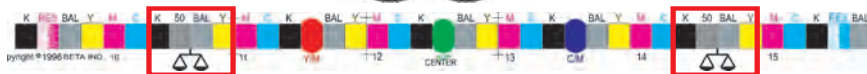
## Automatically Enter Dot Gains

Dot Gains for 3/4tone, midtone, and 1/4 tone can be entered automatically by measuring a solid and then a tint value of the same color. The Dot Gain can be memorized by framing the BULLS  EYE then press ENTER.

				
1	C	50%	Δ 20%	± 3%
	M	50%	Δ 20%	± 3%
	Y	50%	Δ 20%	± 3%
	K	50%	Δ 20%	± 3%

The new Dot Gain values will replace the previous ones.

## GRAY BALANCE

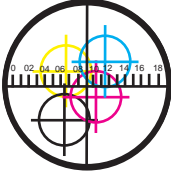


An accurately printed three-color **Gray Balance target** has the same visual appearance as a black tint of the same value.

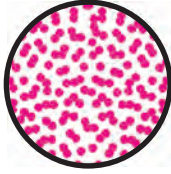
Because **Density, Dot Gain, Trapping, and Pearl Factor** affect Gray Balance targets, they are a good early warning sign for detecting changes in print conditions. When **Gray Balance** targets are located adjacent to a **black tint**, very accurate visual judgments can be made with just a glance. **Beta Eye Scan Custom Gray Balance Color Bars** have Gray Balance targets in every ink key zone, and black tints adjacent to them in every fourth zone, allowing both visual and densitometer press control. The **Balance Symbol** below the Beta Color Bar quickly identifies the 50% black tint and adjacent 3-color Gray Balance target.

# SEE IT MEASURE IT CONTROL IT

REGISTRATION



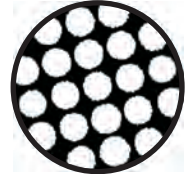
STOCHASTIC



SLUR



FILM



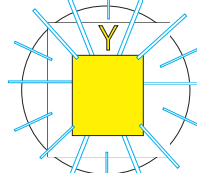
INK/WATER BAL.



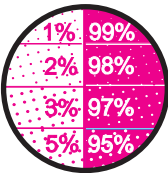
SEE YELLOW



FLUORESCENCE

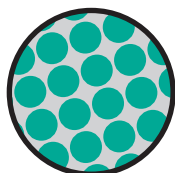


DOUBLING



RESOLUTION

See UV  
Influence I On  
Ink and Paper



PLATES

The Beta Color Viewer III is the ideal companion to the S2 XPress and Beta Custom Color Bar

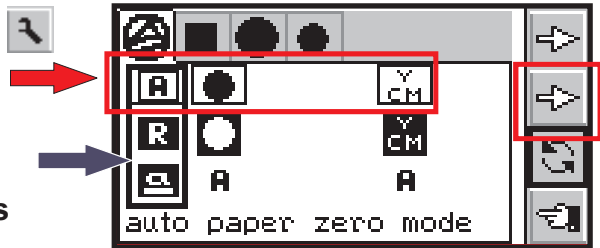
See the nearly invisible yellow and defects on plates, proofs, and print.

**Slur and Doubling** will affect Dot Gains and Gray Balance without having any change in Density measurements.

Similarly, when viewing a printed sheet under a different lighting condition the Gray Balance will also change. Inks and paper have varying amounts of U.V. brighteners that will also change Gray Balance and the appearance of a printed sheet. The Beta Color Viewer III is a useful tool that features a **U.V. light source** that will visually detect the **fluorescence** and **metameric** influence.

# Automatic Mode Settings


To access, go to settings display and press Enter.



All Automatic Function Details Are Displayed:

1 2 3

The screen shows icons in row 2 framed in **RED**, (red arrow) Each individual icon that is framed in black indicates that it is active and has an **A** underneath.


The other icons are reversed on a black field and are not active. A black frame outlines the column that is active (blue arrow) and moves by framing the arrow  then **Enter**

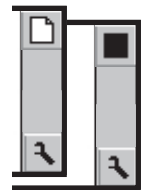
## 1 Auto Paper Zero Mode

Automatically zeros [0.00] to any paper density up to 0.14 Density. This is the preferred setting for most measurements

## Relative Density Mode

Allows zeroing [0.00] on tinted paper or to any density for **null** comparison measurements.

Frame the Relative Density Mode and activate the Go Back icon.  to return to the Starting Screen. On top of the Vertical Tool Bat there will be a Density icon and then a Relative Paper icon

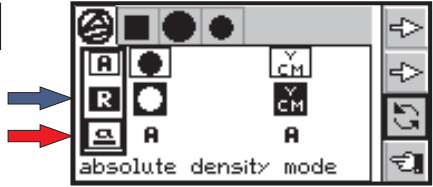


Frame the Paper icon and measure any Density to (0.00). Then measure another density for +/- deviations. The mode will automatically change to **Density**. Subsequent measurements will show +/- differences to the **Zeroed or NULLED** value. This is useful for measuring densities across the width of a sheet without having to remember the original density.


# Automatic Mode Settings


## Absolute Density Mode

**1** Allows measurements in the **Status T mode**. Measuring white paper generally produces a value between



0.04 and 0.09 Density. Measurements in **Relative Density (Blue Arrow)** allow the S2 XPress to NULL (0.00) on any Density for +/- measurements in any color.

**2 Dot Gain.**  The S2 XPress is programmed to automatically measure 2 dot gain percentages, generally 75% and 50%. Measure a solid 100% of a K,C,M,Y and then measure a tint percentage on the color bar of the same color. Adding the dot gain to the starting percent is the equivalent of dot area. The Dot Gain range can be set from 25% to 85%

**3 Color Select**  in **A** allows the S2 XPress to automatically recognize a process color. Changing **A** to **M** (Manual) will show the Density values of C,M,or Y in any color.


## Optional Upgrade to S4 XPress

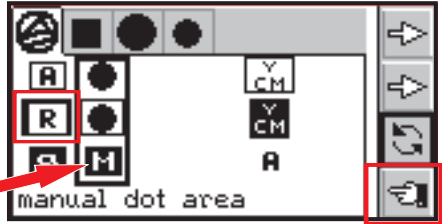
The S2 XPress can be upgraded at any time to provide additional features of 3 Dot Gain Levels, Auto Gray Balance, Trapping, Pearl Factor, and Color Match







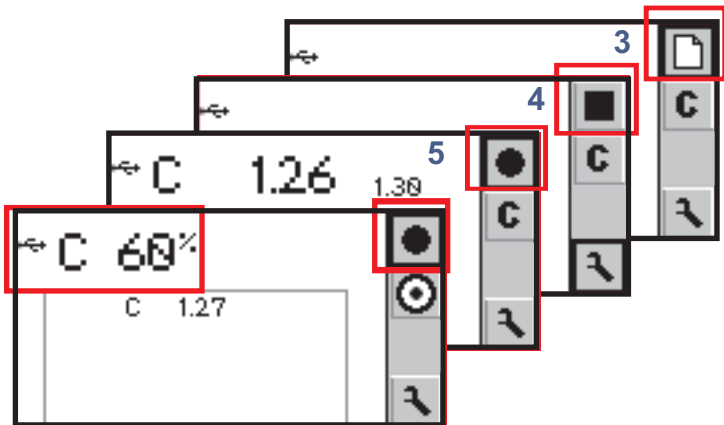
# Manual Mode Settings

## Measure Dot Area 1% to 99%

1. Move the black frame to column 2.  
Frame the **Change Tool**  and press **Enter** to change to **Manual Dot Area**. The **Relative Density Mode** will automatically frame.

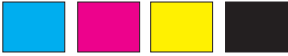


2. Frame the go back  icon and press **Enter**.
3. Frame the paper  icon and zero to paper.
4. Frame the **Density** icon  and measure a solid primary.
5. Frame the **Dot** icon  and measure dot areas of that primary color.





# Manual Mode Settings

## Manual Color Select




1. Move the black frame to column 3.

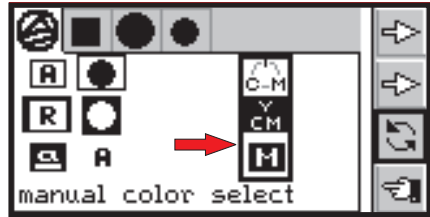
2. Frame the Change  icon and press **Enter** for Manual Color Select.

3. Frame the Go Back  icon and press Enter.

4. Frame a C,M,Y, or K icon on the vertical Tool Bar.

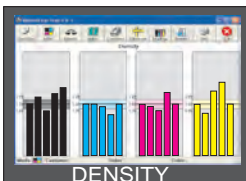
5. Zero to paper by framing the Bulls  Eye and press Enter.

6. Measure any color and the display will show the density of that specific color in the sample being measured. For example, if Magenta is selected, then the Magenta component in any CMYK or special color can be measured without the influence of other colors.

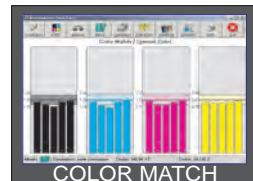
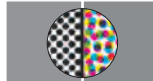
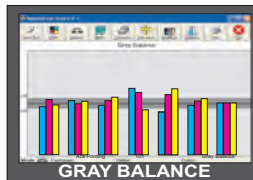


## Optional EyeScan XPress Software

Measure and record vital data for total control and recall.



Automatic Data Entry  
Statistical Library






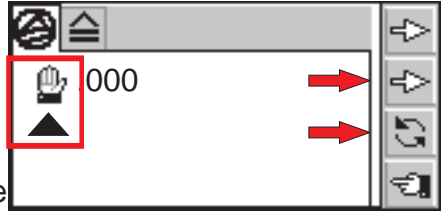
GRACoL G7™  
Match Pantone™ Colors

# Special Functions


## Right Hand / Left Hand


functions can be activated by pressing the **RED BUTTON** on the underside.

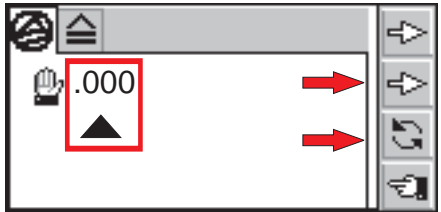
Frame the Change Tool  and press ENTER. Frame the pointer on row 2  and press Enter. Then frame the Change Tool  and press ENTER. The display will invert for left handed users.



## Numerical Resolution

To change the numerical display to either two 0.00 or three 0.000 places after the decimal point, Frame the pointer on row 2  and

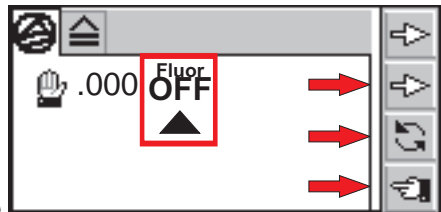
press Enter to move the triangle icon ▲ to below the numerical display. Then Frame the Change Tool  and press Enter.



## Fluorescence

The presence of fluorescence in inks can be detected by changing the normally **OFF** to **ON**. The influence of Fluorescence is generally greater in yellow ink and Hexachrome

Return to the opening screen 



## Slope Control

Changing the SLOPE value allows the S2 XPress to agree with densitometers using other standards for density values.


Press the **RED BUTTON** on the underside.

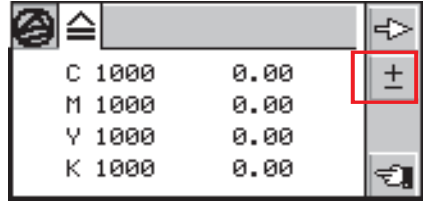
Frame the Settings Display  and press ENTER to open SLOPE CONTROL.






# Slope Control Calibrations

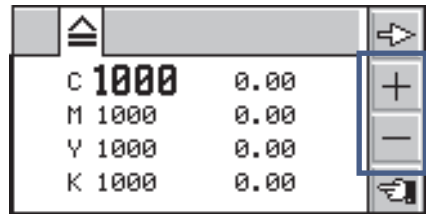
Then frame the Top Arrow  and press ENTER for C M Y K adjustments. The S2 XPress is pre set with C M Y K SLOPE values of 1000 for each color and the Densities in the right column are set at 0.00 for **Paper Relative Density**.



C	1000	0.00
M	1000	0.00
Y	1000	0.00
K	1000	0.00

In **Absolute Density**, other minimum Density values are shown. These values generally range from 0.05 to 0.10. The **SLOPE** adjustment range is 750 to 1250.

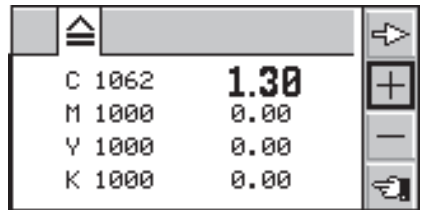
In the left column are Density Slope values for C, M, Y, K. Frame the  icon on the opening screen and press ENTER. For example, the Cyan slope value can be raised or lowered.



C	1000	0.00
M	1000	0.00
Y	1000	0.00
K	1000	0.00

Use the PLUS + or MINUS - icons framed in BLUE to raise or lower the slope values for each channel as needed.

**NOTE:** The slope values can also be adjusted interactively by measuring a sample with a known density for each color. The samples can be measured in any order and the corresponding values will be updated automatically.



C	1062	1.30
M	1000	0.00
Y	1000	0.00
K	1000	0.00



Pressing the **RED BUTTON** on the underside will reset to original 0.00 values and the change Slope will remain.

## Setting Absolute Zero

Press the **RED BUTTON** on the underside. Frame the ABS Icon and press ENTER to open the screen.

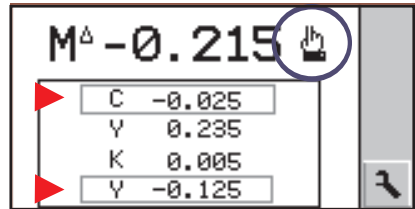


Measure white paper to display CMYK and corresponding minimum density values.

Measure the supplied **White Calibration Cap**. Frame the top arrow  and press ENTER to enlarge any minimum density number to be changed to agree with the values as marked. Press the **+ or -** Icon accordingly. Press the RETURN  icon and continue to the next function.

## Special Features


The Guide Pointer marked by a blue circle indicates that the density of the last measurement must be increased.



The operator must increase the ink feed to that zone. Subsequent density measurements are placed in the history stack as shown below.

Out of tolerance density values in the stack are surrounded by a gray rectangle as marked by red pointers. Dot gain measurements are marked in the same manner during measurement and when they are placed in the history stack.

# Changing Batteries

The S2 XPress is powered by 2- alkaline AA batteries. There are no cables or chargers or Ni-Cad batteries. As the batteries approach the end of their usable life span a low battery warning  will appear.

The S2 XPress will continue to produce many accurate measurements, but the batteries should be replaced when convenient. Remove the bottom plate to access the battery compartment.

Note: Notice the polarity and replace as indicated. The customized settings will be unchanged.

## Technical Specifications

Illumination	Light Emitting Diodes, 45°/0° geometry
Aperture	3 mm (Optional 2 mm or 1mm)
Density Range	D 0.00 – 2.50
Percent	% 0 – 100
Measuring time	0.5 seconds
Graphical Display	160x80 Pixel, 4 gray scales
Repeatability D	+/- 0.01D, 0.2 E
Linearity %	+/- 1 %
Serial Interface	USB
Measurements per battery set	Over 500,000
Batteries	2 AA Alkaline 1.5 V
Filters	Status T [Status I/E/T Special Order]
Polarization filter	Optional
Dimensions	6.75x3x1.75in. 175x75x47mm
Operating condition	10°C to 40°C 10% to 80% relative humidity non-condensing
Storage conditions	-20°C to 60°C 10% to 90% relative humidity non-condensing

## Warranty and Contact Information

### Warranty

The complete instrument is covered for **THREE YEARS** against manufacturing defects for Parts and Labor.

The light source and filters are covered for **SEVEN YEARS** against failure and fading.

Warranty repairs or replacement will be performed on instruments shipped freight prepaid to our office.

Unlimited technical support is provided for the life of the instrument. Support calls are toll-free in the US and parts of Canada.

### Contact Information

Beta Industries

707 Commercial Ave.,  
Carlstadt, NJ 07072 USA

Toll Free 800-272-7336

Tel 201-939-2400

Fax 201-939-7656

Email [info@betacreen.com](mailto:info@betacreen.com)

[www.betascreen.com](http://www.betascreen.com)

# “SEE IT, MEASURE IT, CONTROL IT”

**Beta Press Kits**, consisting of a **S2 XPress**, **Beta Color Viewer**, and a **Custom Color Bar** are designed to match your press specifications and offer a holistic solution for the control of printing problems.

The Beta Color Viewer is the world standard for viewing printing colors including seeing the nearly invisible yellow dots as small as  $\frac{1}{2}$  1% and 10-micron stochastic pixels. It also features a U.V. light source to detect the effects of fluorescence in inks and papers.

The heart of the Press Kit is a unique color bar that allows you to take full advantage of the advanced features of the S2 XPress due to the ability to automatically measure Density, Dot Gain, Trapping, and especially Gray Balance without changing programs or pressing buttons. This is the optimum combination of speed and precision.

If your S2 XPress was not ordered as a Press Kit, you can do so by calling Beta for details and a money saving offer.

**CUSTOMIZED EYE**  **SCAN COLOR BARS**

**FASTER MAKE READY**      Y   M   50% BAL   C   K      **FASTER TURN AROUND**



**PRESS KITS**



**Beta Press Kits**



**Densitometry for Objective Evaluation**



**Beta Color Viewers for Subjective Evaluation**

# Beta Eye Scan Xpress

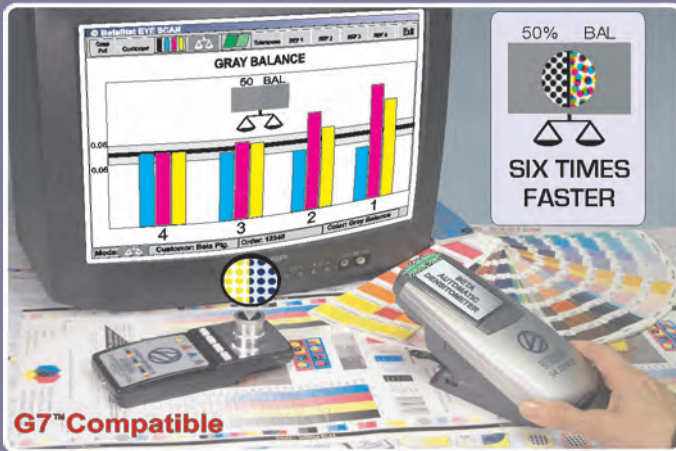
Easy to use software program shows Density, Gray Balance, and Color Match on a colorful screen with unmistakable accuracy. Customer name, job info, measured data and statistical data are saved and recalled for future re-runs.

## NEW EYE SCAN Xpress



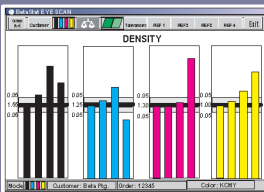
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### MEASUREMENTS AT THE SPEED OF SIGHT Featuring Eye Scan Gray Balance and Your Eyes

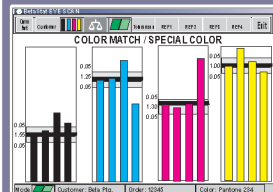


THE SPEED OF A SCANNER - THE COST OF A DENSITOMETER

#### DENSITY



#### COLOR MATCH



# PRINT CHARACTERIZATION CHART

Information generated from SNAP, GRACOL, SWOP and other industry groups.

## SUGGESTED Input Variables

## Output Print Characteristics

Paper/ Substrate	LPI= Line Screen	TAC= Total Area Coverage	SID= Solid Ink Density			PC= Print Contrast			TVI= Total Dot Gain at 50%					
			K	C	M	Y	K	C	M	Y	K	C	M	Y
Grades 1 and 2 premium gloss/dullcoated	175	320%	1.70	1.40	1.50	1.05	40-45	35-40	35-40	30-35	22	20	20	18
Grades 1 and 2 premium matte coated	150-175	300-320%	1.60	1.30	1.40	1.00	40-45	35-40	35-40	30-35	24	22	22	20
Premium text and cover (smooth)	150	260%	1.30	1.15	1.15	0.90	35-45	30-40	30-40	25-35	26	22	22	20
Grade #3 coated	150	310%	1.65	1.35	1.45	1.02	45	40	40	35	22	21	22	18
Grade #5 coated (SWOP)	133	300%	1.60	1.30	1.40	1.00	40	35	35	30	24	22	22	20
Supercal SCA	133	240-260%	1.50	1.25	1.35	0.98	23	21	21	20	28	26	26	24
Supercal SCB/SCC	120	240-260%	1.35	1.10	1.15	0.95	20	19	19	18	28	26	26	24
Uncoated offset	110	240-260%	1.25	1.00	1.12	0.95	20	17	16	17	28	26	26	24
Newsprint (SNAP offset)	85	240%	1.05	0.90	0.90	0.85	16	13	12	15	30	30	30	30
Newsprint (heat set)	100	240%	1.20	1.08	1.15	0.95	16	13	12	15	35	32	32	30