

VERSION 1.0 REFERENCE MANUAL



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# INTRODUCTION

With SymphonyCalibrator, you create calibration curves to use in Nexus RIP, Odystar RIP or PDF RIP.

In Odystar, Nexus and PDF RIP, these calibration curves can be applied in the Screening dialog. In ArtPro, they can be applied in the Nexus Extended Screening dialog. For more information about the use of calibration curves in these applications, please see their Reference Manuals. The use of SymphonyCalibrator and of this manual are covered by Artwork Systems' General License Terms, which are included in the software's CD.

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# 1. FILE MENU

### 1.1. New

When you create a new calibration file, you need to define how to organize the calibration curves. This will create a screens hierarchy, visible in the main window's left pane (see 2. Main Window on page 4).

Depending on the characteristics of your printing process, you may want to organize them by several or all of these criteria:

- Resolution
- Dot Shape
- Ruling
- Angle/Separation name.
- **Note:** The criteria you select determine the screen categories you will be able to add to the file afterwards. For example, if you don't select "Dot Shape", you won't be able to add any dot shape to the screens hierarchy once the file is granted. Son 2.6. Norway Son



the file is created. See 3.6. Nexus Screens on page 8, and 3.7. Odystar Screens on page 9.

#### Angles/Separations

By default, only "Ruling" is selected, and the "Angles" drop-down menu is grayed out. To activate it, select the check box beside it. This drop-down menu offers the following options:

- Angles (selected by default when you activate the drop-down menu),
- CMYK (4 color proofer),
- CMYKcm (6 color proofer with light Magenta and light Cyan),
- CMYKcmk (7 color proofer with light Magenta, light Cyan and grey),
- Custom Names (you can use up to 12 fields to specify your own separation names).

Note: Nexus and Odystar are case sensitive for separation names.

Shortcut: 🗘 - N

### 1.2. Open

This allows you to open a SymphonyCalibrator file.

### Shortcut: 🖸 - O

#### • Opening FastCalibrator files

You can also open legacy FastCalibrator files in SymphonyCalibrator.

Since FastCalibrator files can contain multiple curves types (e.g. film, plate, mask), you will be asked what type of curve in the FastCalibrator file you want to import. This allows easy

✓ Angles

CMYK

CMYKcm

CMYKcmk

Custom Names

conversion from one FastCalibrator file to multiple SymphonyCalibrator files.



If the FastCalibrator file contains multiple angle families with the same dot shape, you will also be asked which angle family in the FastCalibrator file you want to import.

Choose Angle Family	
You can import only one of these angle families at a time	
Choose which family to import	
PCCFlexo 🛟	
Cancel Import	

**Note:** You can only import one curve type and one angle family from a FastCalibrator file into SymphonyCalibrator. If you want to import another curve type/angle family, create a new Symphony-

Calibrator file and import them in it.

# 1.3. Close

This closes the open calibration curve(s).

If the curve isn't saved, a dialog will appear, giving you the option to save it, cancel or continue without saving.

### Shortcut: 🗘 - W

# 1.4. Save

This saves the open calibration curve(s). If the calibration curve wasn't saved before, "Save" will act as a "Save As".

**Note:** SymphonyCalibrator provides no default extension when saving a calibration file. We recommend you use ".cal".

### Shortcut: 🗘 - S

# 1.5. Save As

This saves the open calibration curve(s) under a new name.

# 1.6. Revert

This cancels all the changes you have made since the last time you saved the calibration file.

# 2. MAIN WINDOW

The main window shows the screens in use (left), the graph of the current curve (center) and the values for the selected curve (right).



# 2.1. Curves

In the left part of the window, you can see the screens hierarchy (organized as you defined in the "New" dialog, see 1.1. New on page 2).

To add a screen, go to the Edit menu, then click on "Nexus Screens" or "Odystar Screens". To remove a screen, go to Edit/Remove Screens.

The icons in front of each screen (or sets of screen) indicate the curve associated to it/them:

- A white icon indicates that no curve is defined.
- A green icon indicates a curve defined manually.
- A blue icon indicates the curve has been calculated by OptiCurve<sup>™</sup> (see 2.4. OptiCur ve<sup>TM</sup> on page 5).

- A light blue icon indicates the curve has been calculated by FastCal<sup>™</sup> (see 2.5. Fast-Cal<sup>TM</sup> on page 6).
- A white icon with a black stripe indicates that no curve is defined for this screen, but a curve is defined deeper in the hierarchy.

In the example below, "Concentric" has an icon with a black stripe because there is a curve defined for the 55 lpi screen ruling (green icon) with a Concentric dot.

 A white icon with a colored stripe indicates that a curve is defined for this screen (green for a manual curve, blue for an OptiCurve™ and light blue for a FastCal™ curve)
 AND that a curve is defined deeper in the hierarchy.

### 2.2. Curve graph

The graph gives a representation of the selected curve(s).

The color of a curve on the graph shows the type of curve it is: green for a manual curve, blue for an OptiCurve™ and light blue for a FastCal™ curve.

You can add or move points in a manual curve by clicking or dragging on the graph.



You cannot modify an OptiCurve™ or a FastCal™ curve manually.

### 2.3. Curve Values

You can see the curve values in the table on the right. To add a curve point, type in its "Input" and "Measured" values. To delete a point, select it in the list, and go to Edit/Clear. You can also use the shortcut  $\mathbf{\dot{C}} - \mathbf{X}$ .

You can view/enter values either in Dot percentages or in System Values for Input, and either in Dot percentages or in Density values for Output.

Input	Measured
💽 %Dot	💽 %Dot
🔘 SysVal	O Density
0.000	0.000
0.00 9.06 26.88 35.31 44.38 54.37 68.12 80.94 90.94	0.00 11.56 37.19 48.75 62.81 77.81 88.12 95.31 99.69

For example, if your densitometer doesn't convert the measured densities to dot percentages, you will need to enter your values in densities.

**Note:** If your values are in densities, SymphonyCalibrator will convert them internally to dot percentages, to display them on the graph.

The conversion is done using the "Solid density" and "Yule-Nielsen factor" options, defined in the Preferences (see 5.3. Density to Dot conversion options on page 14). We recommend you set these options before entering density values in SymphonyCalibrator.

	Input	Measure
(	)%Dot	🔘 %Dot
(	SysVal	💽 Density
[	0.000	0.000
	0 23 68 90 113 138 173 206 231	0.000 0.053 0.199 0.286 0.422 0.639 0.894 1.249 1.883

### 2.4. OptiCurve™

An OptiCurve™ is a smooth, optimized curve calculated from the points you entered to define a manual curve.

You can create an OptiCurve™ from 2 points, but the more points you have, the more accurate the OptiCurve™ will be. We recommend you use 6 or 7 points to have a reliable curve.

#### Click on the "Fit OptiCurve™" button to create an OptiCurve™.



An OptiCurve™ is displayed in blue, both on the graph and in the screens hierarchy.

Note: You cannot modify an OptiCurve™ manually. To change the curve back into a manual curve, click the "Clear OptiCurve™" button.

### • OptiCurve<sup>™</sup> Preferences

You can set preferences for OptiCurve™ creation (Force Value, Weighting, Number of Bends) in the Preferences windows. See 5.1. OptiCurve<sup>TM</sup> Options on page 14).

**Note:** You can either use the same preferences for each OptiCurve<sup>™</sup>, or change the preferences before calculating a specific OptiCurve<sup>™</sup> (if you need this curve to have different characteristics).

# 2.5. FastCal™

 $\mathsf{FastCal}^{\mathbb{M}}$  is an option to derive curves at different screen rulings from curves already measured.

To use it, you need to have at least 2 OptiCurves™ similar to the curve to calculate, but with a different screen ruling.

### • Example 1

You have OptiCurves<sup>™</sup> for Round dot screens at both 73 and 120 lpi (blue icons). From those, you can derive FastCal<sup>™</sup> curves for Round dot screens at all other screen rulings.



Select the screens you want a FastCal<sup>™</sup> curve for (e.g. 85, 100, and 113 lpi) in the screens hierarchy, and click on the "Calculate FastCal<sup>™</sup> Curves" button.

**Note:** The "Calculate FastCal<sup>™</sup> Curves" button is grayed out if FastCal<sup>™</sup> curves can't be derived for the screens you selected (there aren't 2 OptiCurves<sup>™</sup> with similar characteristics).

This displays the FastCal<sup>™</sup> curves in light blue on the graph (the darker blue curves with the green points are the Opticurves<sup>™</sup>).



The FastCal<sup>™</sup> icons in the screens hierarchy are also light blue.

r	$\square$	Round
	►	73
	►	85
	•	100
		113
	•	120

### • Example 2

You have OptiCurves<sup>™</sup> for Euclidean dot screens for the Cyan separation at both 55 and 85 lpi (blue icons). From those, you can derive FastCal<sup>™</sup> curves for Euclidean dot screens at all other screen rulings for Cyan

Select the Cyan screens you want a FastCal<sup>™</sup> curve for (e.g. Cyan at 63 lpi and Cyan at 74 lpi) in the screens hierarchy, and click on the "Calculate FastCal<sup>™</sup> Curves" button.

Note: Use the Shift key to select non-consecutive screens.



This displays the FastCal<sup>™</sup> curves in light blue on the graph, and displays a light blue icon for Cyan at 63 lpi and 74 lpi in the screens hierarchy.



To remove a FastCal<sup>™</sup> curve, select it in the screens hierarchy and click on the "Clear FastCal™ Curves" button.

### 2.6. Calibration Shift

If you have already created all your curves and you notice a dot gain variation in your printing process, you don't have to manually re-enter all the new values to create new curves. You can update your existing curves in proportion of the variation you noticed with the Calibration Shift feature.

To use the Calibration Shift feature, select the screen you noticed Calibration Shift the variation in, and click on the "Shift Calculator" button at the top of the calibration window.

campration sint	
Shift Calculator	)
Current Cal Shift	0.000

Clear FastCal<sup>™</sup> Curves

#### • Applying a shift

In the "Shift Calculator" dialog, enter the Desired Value and the Actual Value (the value you measured on the screen). You can see the characteristics (resolution, dot shape and ruling) of the screen you selected at the top of the dialog.

Press the **Return** key: SymphonyCalibrator calculates the shift in microns between the two values, and displays it in the "New Shift" field.

Click on "Recalculate All Curves" to apply the shift to all the curves you defined.

Shift Calculator		
Resolution 2400		
Dot	Concentric	
Ruling 55		
Desired Value	50.000 %	
Actual Value	47.000 %	
Current Shift	0.00µ	
Change in Shift	11.23µ	
New Shift	11.23µ	
Cancel	Zero	
Recalculate All	Curves	

The original curves take a dim color, and the shifted curves are displayed in the original colors (green for manual curves, blue for OptiCurves™, light blue for FastCal™ curves).



You can see the shift applied in microns just under the "Shift Calculator" button.



Current Cal Shift: 11.23µ

**Note:** After applying a Calibration Shift, you won't be able to edit your curves (create new manual curves, fit OptiCurves™ or derive FastCal™ curves) anymore. If you need to edit your curves, revert the Calibration Shift (see below).

#### • Reverting a shift

To revert to the original curves, click on the "Zero" button and then on "Recalculate All Curves". This will create a shift that balances out the current shift, so that the "New Shift" becomes 0. For example, if the current shift is 11.23, the "Zero" button will create a shift of -11.23, so the "New Shift" is 0.

Desired Value	0.000	%
Actual Value	0.000	%
Current Shift Change in Shift New Shift	Оµ -11.23µ Оµ	
Cancel	Zero	)
Recalculate All	Curves	)

#### • Applying a new shift

You can apply a further shift if you need to (e.g. if later on you notice a new dot gain variation on your screens). As for the first shift you applied, select the screen, click on "Shift Calculator", and enter the values. When you press the **Return** key, SymphonyCalibrator calculates the additional shift from the values you just entered ("Change in Shift"), and adds it to the (existing) "Current Shift", to get the total shift ("New Shift").

Click on "Recalculate All Curves" to apply the shift to all your curves.

To close the dialog without changing the shift, click on the "Cancel" button.

Shift Calculator		
Resolution 2400		
Dot	Concentric	
Ruling	55	
Desired Value	50.000 %	
Actual Value	48.000 %	
Current Shift	11 22	
Channel in Chift	11.25µ	
Change in Shift	7.44µ	
New Shift	18.67µ	
Cancel	Zero	
Recalculate All	Curves	

# 3. EDIT MENU

# 3.1. Cut / Copy / Paste

The "Cut", "Copy" and "Paste" commands allow you to cut, copy and paste points from/to a curve.

**Note:** You can only cut, copy or paste points from/to a manual curve. If you selected an Opticurve<sup>™</sup>, you need to first use the "Clear Opticurve<sup>™</sup>" button before you can cut, copy or paste points.

Shortcuts: C - X (Cut) C - C (Copy)

C - C (Copy)

### 3.2. Clear

The "Clear" command removes the selected point(s) from a curve.

**Note:** You can only clear points from a manual curve. If you selected an Opticurve<sup>™</sup>, you need to first use the "Clear Opticurve<sup>™</sup>" button before you can clear points from it.

### Shortcut: Backspace

### 3.3. Select All

"Select All" allows you to select all the points in the curve.

Shortcut: 🗘 - A

# 3.4. Load Data

This option allows you to load curve data you saved earlier in a text file (see below), and feed it into the selected curve.

# 3.5. Save Data

This allows you to save the selected curve's data (the points coordinates shown in the right part of the main window) into a text file. The data in the text file is separated by tabs.

# 3.6. Nexus Screens

The "Nexus Screens" option allows you to set up your calibration file with curves for different Screen Resolutions, Dot Shapes, Screen Rulings, Angles and/or Separations for NexusRIP. You can also use it to add extra NexusRIP screens to your calibration file at any time.

#### • Adding Nexus Screens

1. Click on Edit/Nexus Screens to open the "Add Nexus Screens" dialog.

Add	Nexus Screens	
Resolution	2400	
Family	Paragon	\$
Dot	Euclidean	\$
55 63 74 85 99 113 120 131 153 169 179 200 214 226 242 283 309		
Cancel	ОК	

- 2. Enter your desired resolution in the "Resolution" text box.
- 3. In the "Family" drop-down menu, select your Screening Family. This determines which dot shapes are available (e.g. if you select the "FM" Screening Family, the "Dot" drop-down menu will display "Stochastic").
- Select your dot shape in the "Dot" drop-down menu. This determines which screen rulings are available (e.g. for a stochastic dot, the screen rulings available will be in microns).
- 5. Select your desired screen ruling(s) in the rulings list (use the **Shift** key to add or remove screen rulings from the selection).
- 6. Click "OK".
- **Note:** You need to define all the characteristics (Resolution, Screening Family and Dot Shape) to display the appropriate list of screen rulings for your printing process. However, the characteristics you didn't define when creating the file (e.g. Dot Shape, if you use only one type of dot) won't be added to the screens hierarchy in the main window.

For more information about defining a screens hierarchy on file creation, see 1.1. New on page 2.

**Note:** If you choose identical dot shapes in different Screening Families (e.g. Paragon Round and PCC Flexo Round), their screen rulings will be displayed together in the screens hierarchy (the screens hierarchy doesn't show Screening Families).

# 3.7. Odystar Screens

The "Odystar Screens" option allows you to set up your calibration file with curves for different Screen Resolutions, Dot Shapes, Screen Rulings, Angles and/or Separations for Odystar RIP.

You can also use it to add extra Odystar RIP screens to your calibration file at any time.

#### Adding Paragon Odystar Screens

1. Click on Edit/Odystar Screens, and choose "Paragon".

Nexus Screens		
Odystar Screens	•	Paragon
Remove Screens		ParagonOrganic FM
		From Cookbook

2. This opens the "Add Paragon Screens" dialog.

	Add Paragon Scr	eens	
Resolutions	Shapes	Rulings	
600 900 1000 1016 1200 1219.2 1270 1800 1828.8 2000 2400 2438.4 2540 3000 3600 3657.6 4000	Euclidean Round Square Ellipse Diamond	5 10 15 20 35 40 45 55 65 75 85 100 110 120 133 150 175 200 220 250	• •
Edit		Edit	
Angle Family Standard	Å Ţ		
Break Point (%) 35			
Cancel OK			

- **Note:** This dialog only shows values for the screening characteristics you defined when creating the file (see 1.1. New on page 2). For example, if you only defined "Ruling", the "Resolutions" and "Shapes" lists will be empty.
- 3. Select your desired Resolution, Dot Shape and Screen Ruling.

Note: Use the "Edit" buttons to create new Resolutions or Screen Rulings.

4. If you selected "Angles" when creating the file, the "Angle Family" drop-down menu is available.

Choose from "Standard". "+7.5 Degrees" or "-7.5 Degrees".

- Angle Family 
  V Standard
  Plus +7.5 Degrees
  Break Point (%)
  Minus -7.5 Degrees
- 5. If you select an asymmetrical dot shape (Ellipse or Diamond), or several dot shapes including an asymmetrical one, the "Break Point" drop-down menu is available. You can choose from several break points values, including "Line screen".



6. Click "OK".

### Adding ParagonOrganic Odystar Screens

You can only add ParagonOrganic screens to your calibration file if you selected "Ruling" when creating the file (see 1.1. New on page 2).

1. Click on Edit/Odystar Screens, and choose "ParagonOrganic".

2. This opens the "Add ParagonOrganic Screens" dialog.



- 3. If you selected "Resolution" when creating the file, you can enter your desired Resolution.
- 4. Select your desired screen ruling(s) in the list and click "OK".
- Adding FM Odystar Screens

You can only add FM screens to your calibration file if you selected both "Resolution" and "Ruling" when creating the file (see 1.1. New on page 2).

1. Click on Edit/Odystar Screens, and choose "FM".

#### 2. This opens the "Add FM Screens" dialog.

Add FM Screens
Resolution 2400
Dot Sizes
$\begin{array}{c} FM-1(11\mu)\\ FM-2(21\mu)\\ FM-3(32\mu)\\ FM-4(42\mu)\\ FM-5(53\mu)\\ FM-6(64\mu)\\ FM-7(74\mu)\\ FM-8(85\mu)\\ FM-9(95\mu)\\ FM-10(106\mu)\\ FM-10(106\mu)\\ FM-11(116\mu)\\ FM-12(127\mu)\\ FM-13(138\mu)\\ FM-14(148\mu)\\ FM-15(159\mu)\\ FM-16(169\mu)\\ FM-16(169\mu)\\ FM-16(180\mu)\\ FM-18(191\mu)\\ FM-19(201\mu)\\ FM-20(212\mu)\\ \end{array}$
Cancel OK

3. Enter your desired Resolution in the "Resolution" text box.

- 4. Select your desired screen ruling(s) in the list and click "OK".
- Adding Odystar Screens from a CookBook
- 1. Click on Edit/Odystar Screens, and choose "From Cookbook"

2. This opens a Finder window. Select the Cookbook file and click on the "Choose" button.

000	Choose a File	
	Choose cookbook	
	VariousDotsCookbook.cbkd	Q search
Computer	🗋 VariousDotsCookbook.cbkd 🕨	
Network	VariousDotsCookbook.pcbk	-
Desktop		
Applications		
👚 User		
Documents		Name VariousDot
Movies		sCookbook .cbkd
& Music		Size 25 KB
Pictures		
New Folder	Car	ncel Choose

- **Note:** You can either select a cookbook file (".pcbk"), or a cookbook description file (".cbkd"), which is lighter than a cookbook file but still contains all the necessary information.
- 3. The screens from the cookbook that have the same characteristics as those defined in the file (e.g. Dot Shape and Ruling) will be added to your calibration file.

# 3.8. Remove Screens

This allows you to delete the selected screens from your calibration file.

# 4.1. Micron Calculator



The Micron Calculator tool allows you to:

- Calculate the difference in microns between 2 dot percentages (e.g. when you measure a dot gain at 50%).
- Calculate the dot percentage difference for a given micron difference (e.g. to estimate the dot gain at 50% of a printing process with a given micron gain).

#### • Calculating the difference in microns between 2 dot percentages

- 1. Enter your Screen Ruling and select its unit (lines/inch or lines/cm).
- 2. Enter the dot percentage you measured in the "Original %" text box.
- 3. Enter the new (expected) dot percentage in the "Final %" text box.
- 4. Press the Return key.

SymphonyCalibrator displays the micron change on the right.

Original %	57.000		
Final %	50.000	Micron Change:	-9

#### • Calculating the final dot percentage for a given micron difference

- 1. Enter your Screen Ruling and select its unit (lines/inch or lines/cm).
- 2. Enter the dot percentage you measured in the "Original %" text box.
- 3. Enter the micron change in the "Micron Change" text box.
- 4. Press the Return key.

SymphonyCalibrator displays the final dot percentage on the right.

Original %	50.000		
Final %	50.000	Micron Change:	0μ
Micron Change	7.000	Final %:	55.37%

# 4.2. Curve Information

The "Curve Information" window gives you details on the curve you selected.

0	Curve Information		
	OptiCurve <sup>™</sup> selected		
	Force value (y):	Off	
	Weighting:	Highlight	
	Number of bends:	Data optimized (3 bends)	

It shows the type of curve you selected (manual curve, OptiCurve™ or FastCal™ curve), and settings defined in the Preferences used to create the curve.

• Force value (y)

This is only applicable to OptiCurves™. For more information see • Force value (y) on page 14.

• Weighting

This is only applicable to OptiCurves™. For more information see • Weighting on page 14.

• Number of bends

This is only applicable to OptiCurves™ and FastCal™ curves. For more information see ● Number of bends on page 14.

# 4.3. Complete Curve Data

The "Complete Curve Data" option opens the "Complete Curve" dialog.

Sys	In (%)	Out (%	6)
000	0.00	0.00	-
001	0.39	0.96	U
002	0.79	1.91	
003	1.18	2.85	
004	1.57	3.79	
005	1.96	4.72	
006	2.35	5.65	
007	2.75	6.57	
008	3.14	7.48	
009	3.53	8.39	
010	3.92	9.29	
011	4.31	10.18	
012	4.71	11.07	
013	5.10	11.95	
014	5.49	12.83	
015	5.88	13.70	
			¥
_ Sł	iow co	mpen	satior

This shows the curve selected, and the points the curve passes through, for every System Value (0-255).

### • Show compensation curve

Ticking this checkbox shows the values for the compensation curve.

Sys	In (%)	Out (%	)
000	0.00	0.00	÷
001	0.39	0.16	U
002	0.79	0.32	
003	1.18	0.48	
004	1.57	0.65	
005	1.96	0.81	
006	2.35	0.97	
007	2.75	1.13	
008	3.14	1.30	
009	3.53	1.46	
010	3.92	1.63	
011	4.31	1.79	
012	4.71	1.96	
013	5.10	2.12	
014	5.49	2.29	
015	5.88	2.45	
			¥

# 5. PREFERENCES

To open SymphonyCalibrator's Preferences, go to SymphonyCalibrator/Preferences.

Preferences			
Force value (y)	0.000 %		
Weighting	Highlight		
Number of bends	Data optimized		
Calibration shift curve display	Original and shift curves		
Density input	Positive 🛟		
Solid density	2.000		
Yule-Nielsen factor	1.700		
Check for negative slope	⊻		
Add point at 0%			
Add point at 100%			
Cancel	ОК		

Shortcut: C - , (command - comma)

# 5.1. OptiCurve™ Options

SymphonyCalibrator calculates OptiCurves™ (see 2.4. OptiCurve<sup>TM</sup> on page 5) to get the smoothest optimized curves from all the points you defined manually.

However, in certain cases, you may want to give priority to a point / an area of the manual curve over the rest of the curve.

The OptiCurves™ options allow you to do this (Force value and Weighting), as well as to control the curve smoothness (Number of bends).

**Note:** You can either use the same preferences for each OptiCurve<sup>™</sup>, or change the preferences before calculating a specific OptiCurve<sup>™</sup> (if you need this curve to have different characteristics).

### • Force value (y)

The "Force value (y)" option allows you to force OptiCurves™ to go through an important point (the curve point closest to the Force value you define).

For example if the Force value is 10%, the curve will go through the point whose output is closest to 10%.

This point is indicated with a cross on the graph, as in the example on the right.



**Note:** For Flexo the Force value will usually be a minimum dot (e.g. 0.6%), for Offset it will usually be 50%.

### • Weighting

The "Weighting" allows you to privilege an area of the curve (highlights, midtones or shadows) when fitting an OptiCurve™.

It means the OptiCurve™ will be closer to the points in the weighted area (allowing a bigger difference in the other areas), while still being smooth.

- "Highlight": the OptiCurve™ will fit the points between 0 and 10% more closely.
- "Midtone": the OptiCurve™ will fit the points between 40 and 60% more closely.
- "Shadow": the OptiCurve™ will fit the points between 90 and 100% more closely. If the option is off, the OptiCurve™ will be calculated to fit all points equally.
- Number of bends

The "Number of bends" allows you to set the number of bending points in the curve. Fewer bends will result in a smoother curve.

Select "Data optimized" to base the number of bends on the curve data (this gives a closer fit to the manual curve).

# 5.2. Calibration shift curve display

This option defines the display of the curves created with the Calibration Shift feature (see 2.6. Calibration Shift on page 7).

• Original and shift curves

This is the default setting. The original curve takes a dim color, and the shifted curve is displayed in the original color (green for manual curves, blue for OptiCurves™, light blue for FastCal™ curves).

• Shift curves only

The original curve is hidden, and only the shifted curve is shown (in color).

# 5.3. Density to Dot conversion options

The "Density input", "Solid density" and "Yule-Nielsen factor" options allow you to convert densities to dot percentages:

if your densitometer doesn't do the conversion for you, you can enter density values and convert them directly in SymphonyCalibrator.

#### • Density input

Set this to "Positive" if you are measuring densities from a positive film or plate, and to "Negative" if you are measuring densities from a negative film.

#### • Solid density

Measure a solid patch on your film or plate, and enter the density value for it in the "Solid density" text box.

- If you measured your solid patch from a positive film or plate, the solid density value will correspond to a 100% dot.
- If you measured your solid patch from a negative film, the solid density value will correspond to a 0% dot.

SymphonyCalibrator uses this value to convert densities to dot percentages, when you enter your values in densities (see 2.3. Curve Values on page 5). It also uses it to convert the dot percentages back to densities for display.

#### • Yule-Nielsen factor

- Leave this checkbox unticked to use the Murray-Davies formula for the density to dot conversion.
- Tick this checkbox to use the Yule-Nielsen formula for the conversion. You can define the "N-factor" to apply to the conversion in the text box, or use the default value of 1.700.

### 5.4. Check for negative slope

Tick this checkbox if you want SymphonyCalibrator to display an error message when you save a file containing a negative slope.

For example, the following curve has a negative slope in the highlights:



When saving a file which such a slope, SymphonyCalibrator displays a message like:



### 5.5. Add point at 0% / 100%

Tick these checkboxes to automatically add a point at the origin (0,0) and at the maximum (100,100) to all manual curves.

- When to add a point at 0%
- If your curves have highlights above the 1:1 line, add a point at 0%.
- If your curves have highlights below the 1:1 line, don't add a point at 0%.
- When to add a point at 100%
- If your curves have shadows below the 1:1 line, add a point at 100%.
- If your curves have shadows above the 1:1 line, don't add a point at 100%.

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