BacklightFly Manual

http://www.febees.com/

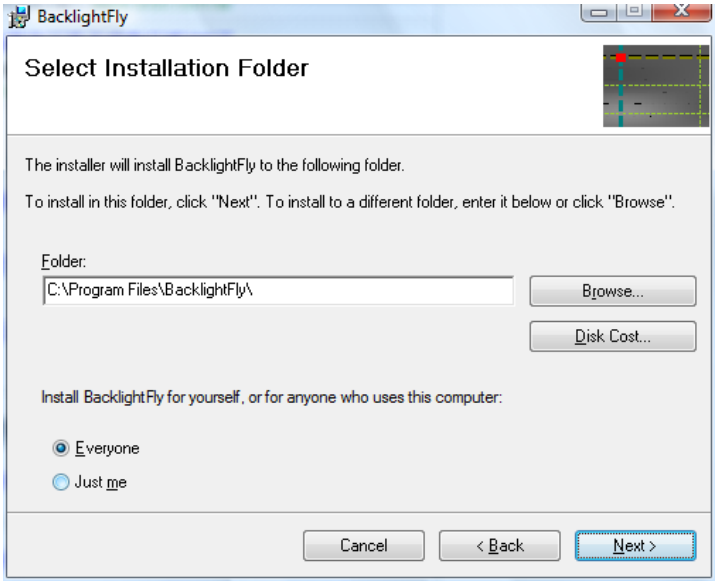
Contents

Start

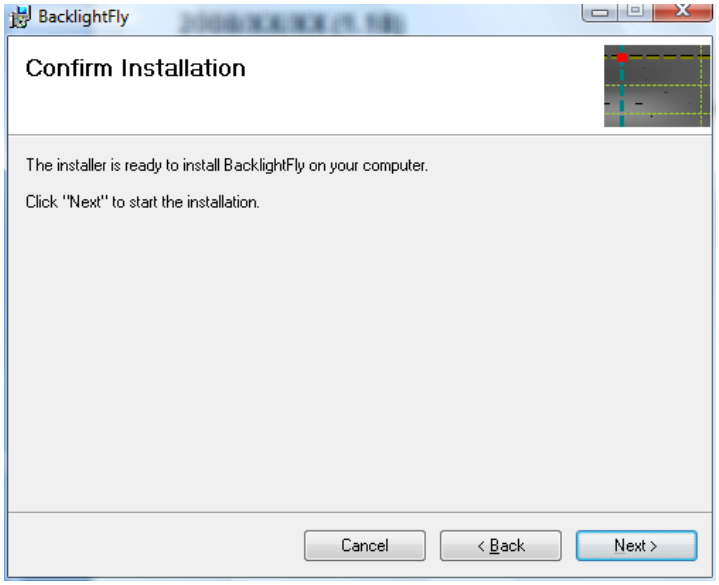
Installation

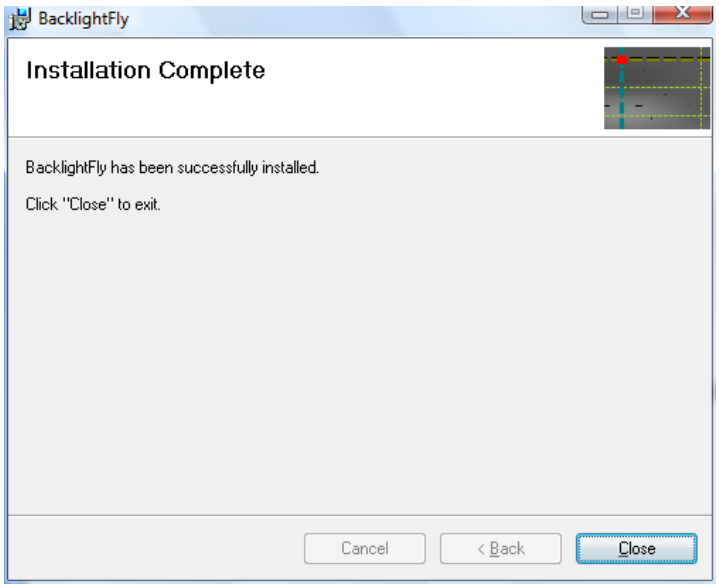
CDROM Version

1. Insert disk labeled “BacklightFly Installation Disk” into CDROM drive.
2. Open the CDROM folder.
3. Execute BacklightFlySetup.msi (double click on the BacklightFlySetup.msi file), and follow the installation wizard[1].



[1] If your system doesn’t have .Net Framework 2.0 installed, Setup will ask you to download and install it from our website. If you don’t have Internet connection available, please answer no and close setup program, then execute dotnetfx.exe to install it. Once it is done, re-execute BacklightSetup.msi and finish the installation.

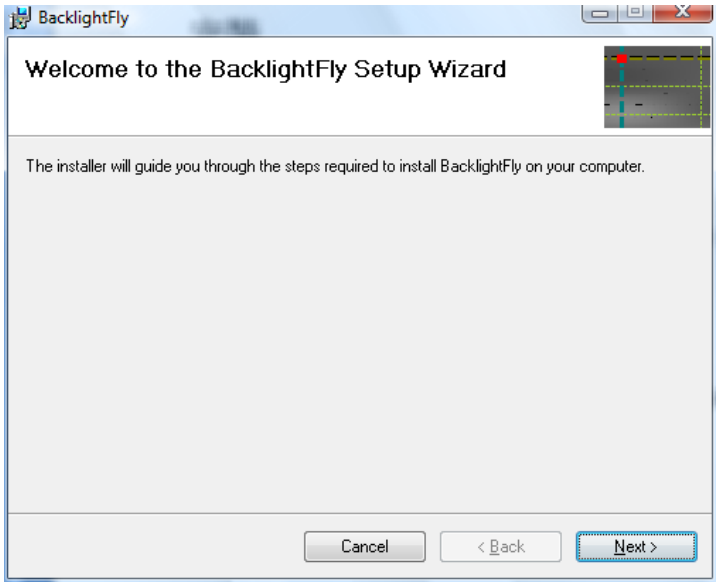

BacklightFly
Confirm Installation
The installer is ready to install BacklightFly on your computer.
Click "Next" to start the installation.
Cancel
< Back
Next >

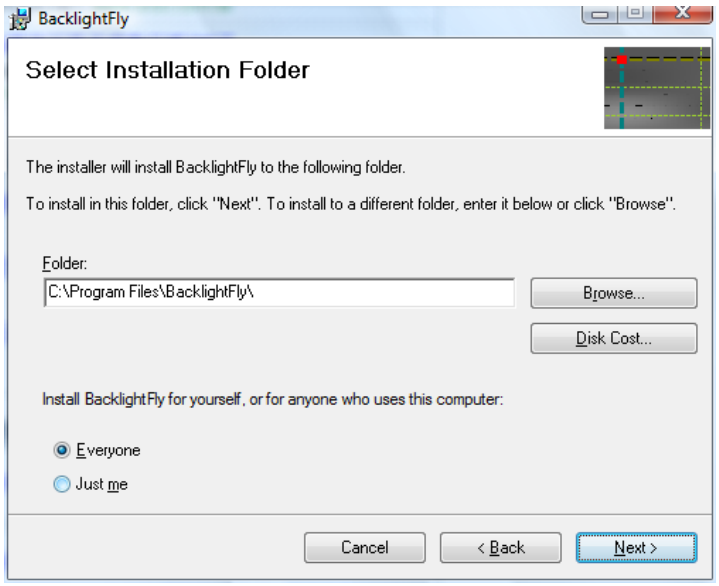

BacklightFly
Installation Complete
BacklightFly has been successfully installed.
Click "Close" to exit.
Cancel
< Back
Close

4. Finished.

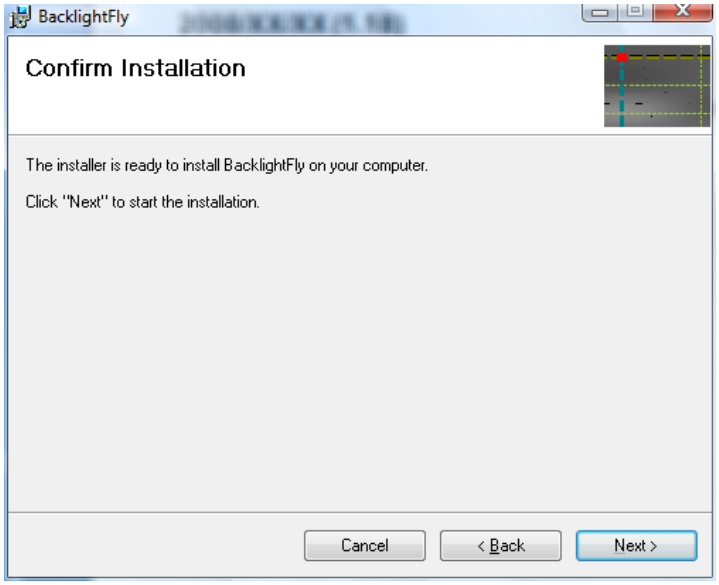
Download Version

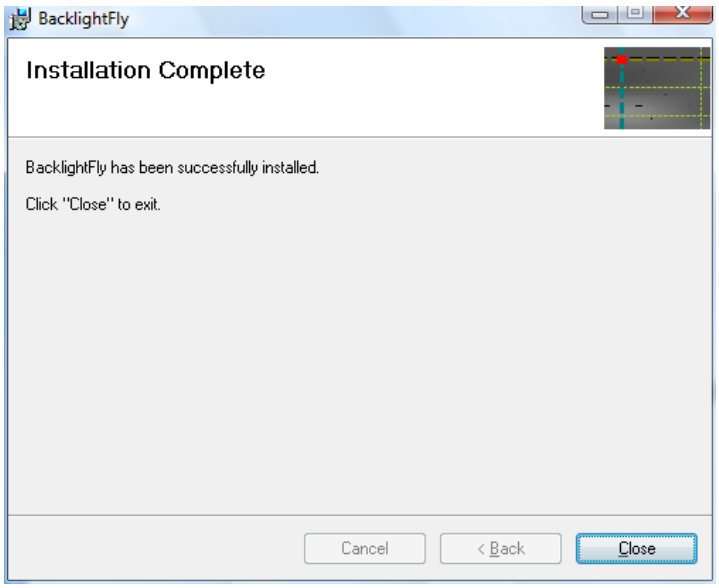
1. Execute BacklightFlySetup.msi (double click on the BacklightFlySetup.msi file) and follow the installation wizard[2].





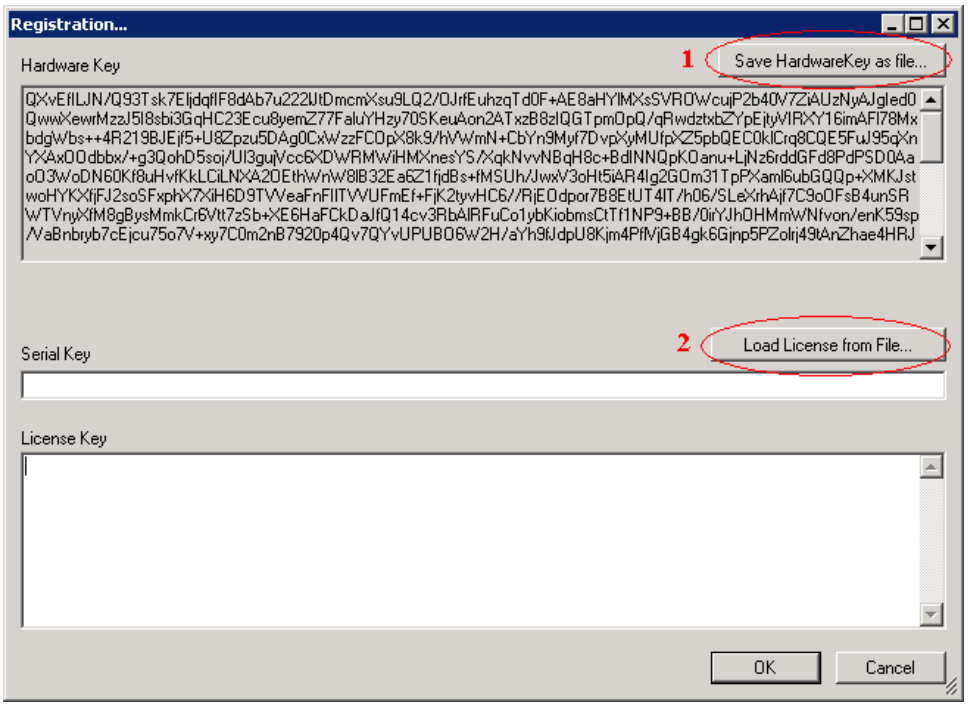
[2] If your system doesn't have .Net Framework 2.0 installed, Setup will ask you to download and install it from our website. Once you finish .Net Framework 2.0 installation, please re-execute BacklightFlySetup.msi and finish the installation.


BacklightFly
Confirm Installation
The installer is ready to install BacklightFly on your computer.
Click "Next" to start the installation.
Cancel
< Back
Next >


BacklightFly
Installation Complete
BacklightFly has been successfully installed.
Click "Close" to exit.
Cancel
< Back
Close

2. Finished.

Registration



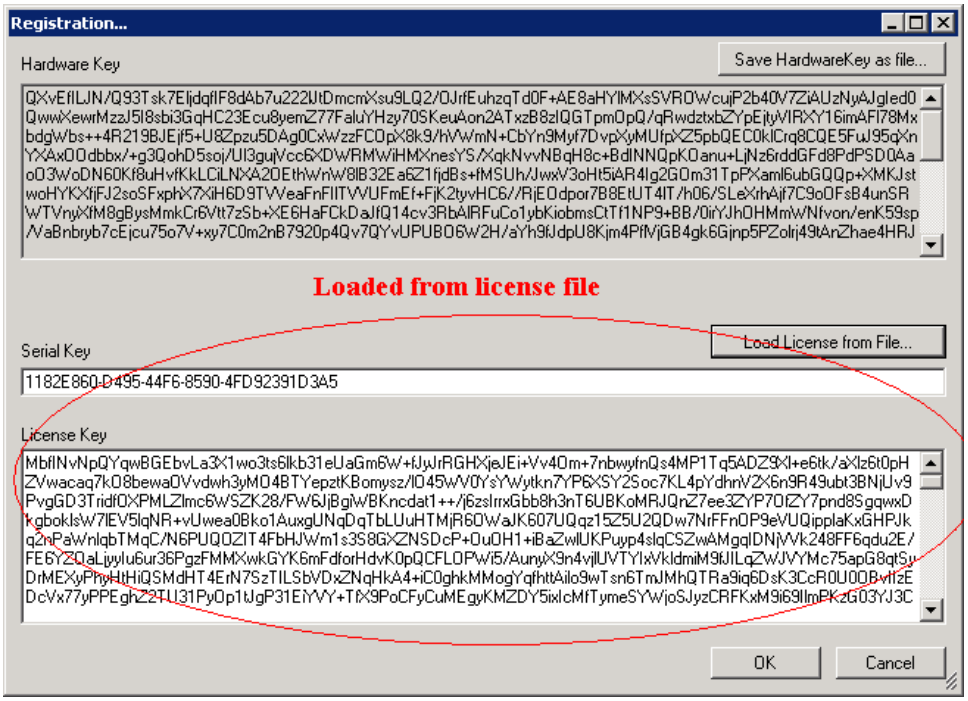
Registration can be divided into two steps as shown in above picture.

Step1:

- Save Hardware Key to a file and email it to support@febees.com .
- Once we receive your file, we will produce an unlock license file and send it back to you.

Step2:

- Load the License file that you receive from us and click OK.
- Registration Finished.



Please note that BacklightFly will close itself automatically after your click OK button. You will need to start it again from Start menu,

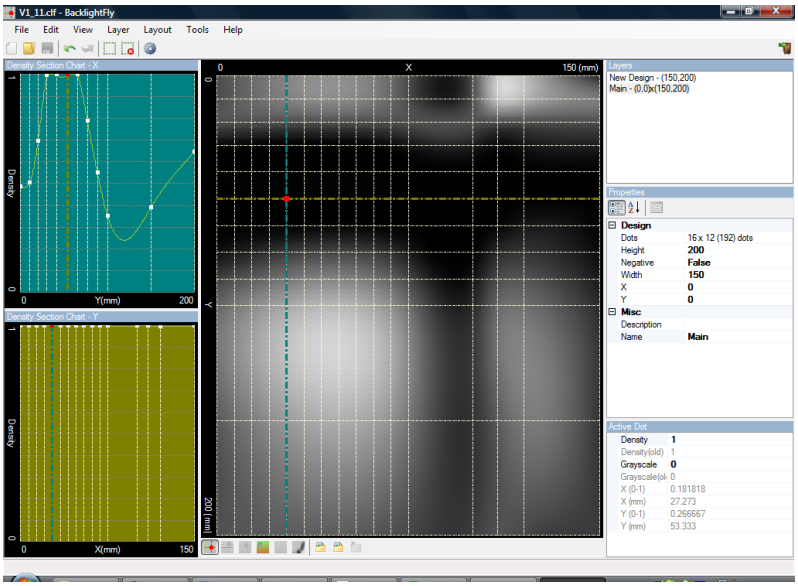
BacklightFly 1-2-3

Do you know that it only takes three steps to make BacklightFly works for you?

1. Enter your density distribution.
2. Output dot patterns using one of built-on output methods.
3. Review output dot patterns.

One of the design goals of BacklightFly is to eliminate the unnecessary complex. Instead of providing you tons of features, in which none can deliver precise density output, we focus, and only, on precise density outputs.

Overview



Layer Window: The layers list. First item is always Layer Container, others are layers.

Property Window: The properties of selected design or layer in the Layer Window.

Density Chart Window: Display the density chart of active dot.

Design Window: For density values editing. Several view modes are available to toggle.

- **Design View**: Foreground: design lines; Background: current density displays as grayscale.
- **Loaded Image View**: Foreground: design lines; Background: loaded image.
- **Design Tiles Loaded Image View**: Upper: design view; Bottom: loaded image view.
- **CCD View**: This view will be redesigned.
- **Overlay View**: This view will be redesigned.
- **Preview View**: Preview the current density as grayscale.

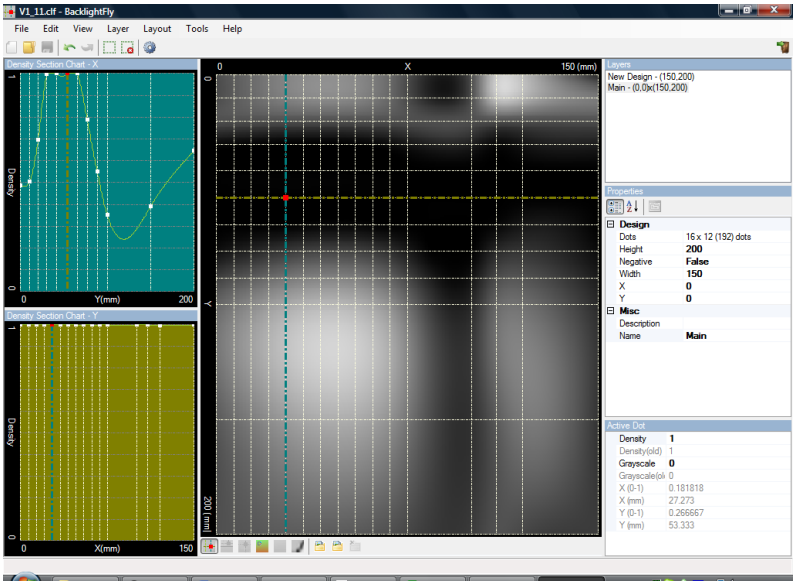


Figure 1 Design View

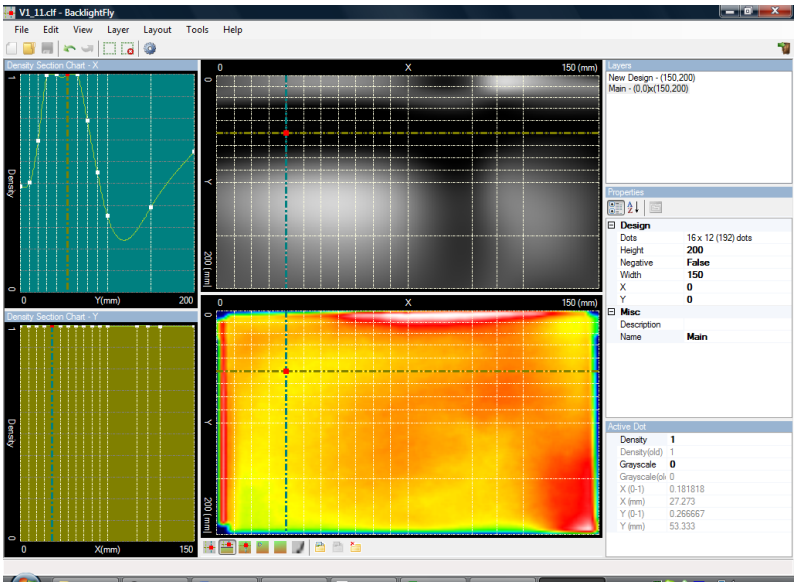


Figure 2 Design tiles loaded image view

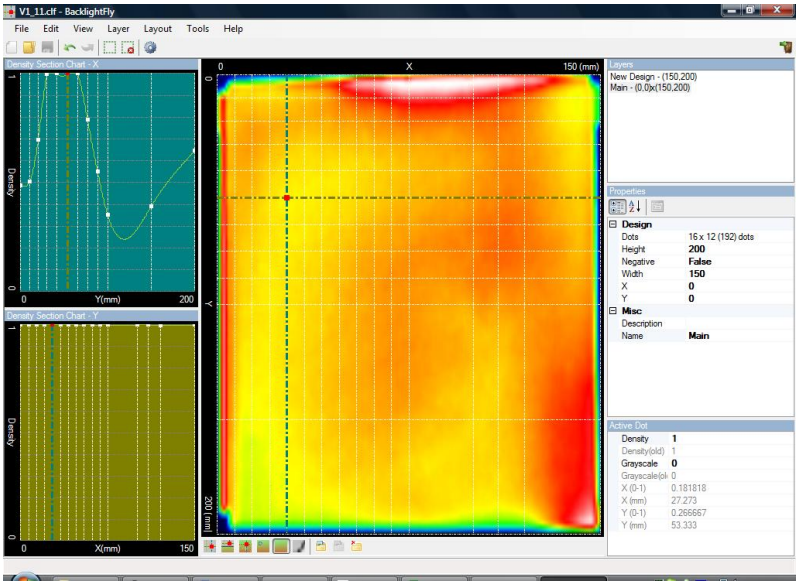


Figure 3 Loaded image view

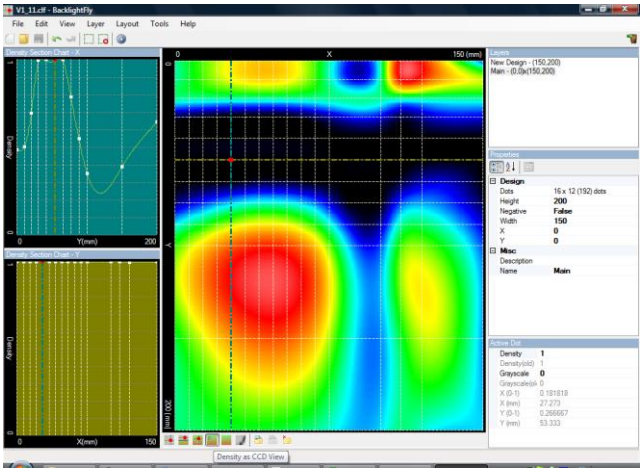


Figure 4 CCD view

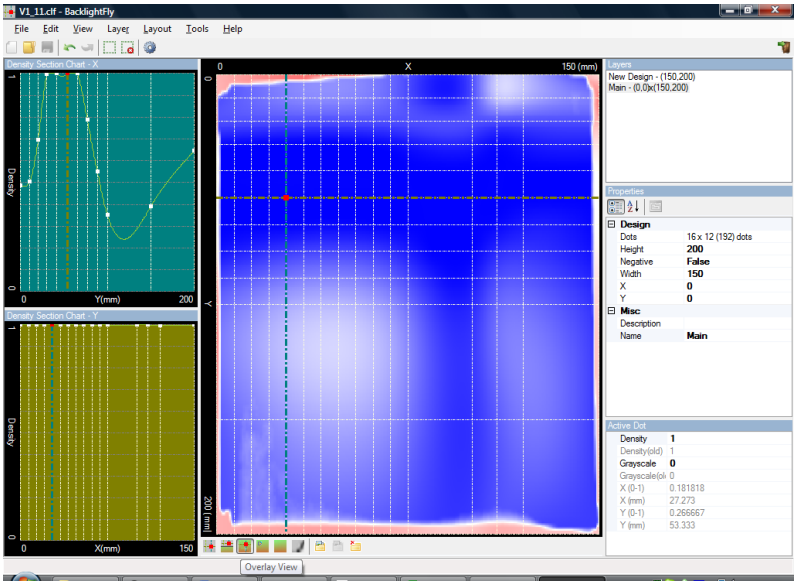


Figure 5 Overlay View

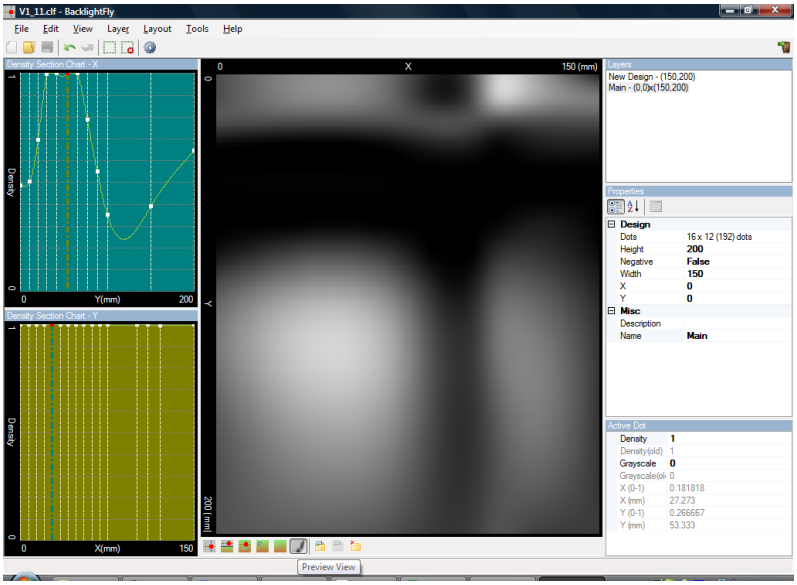


Figure 6 Preview View

Shortcut keys:

Space: Toggle selected/unselected of current density dot.

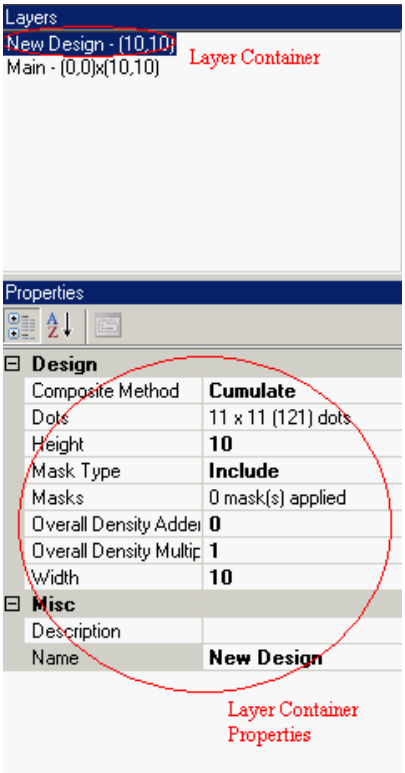
Left Double Click: Toggle selected/unselected of current density dot.

Left Click and Hold + Drag: Toggle selected/unselected of multiple density dots.

Ctrl + Left Click and Hold + Drag: Select a section and open the section density chart.

Layers

Layer Container



Composition Method:

Composition Method	Effects
Cumulate	cumulate densities of the same spot of layers
Average	averages densities of the same spot of layers
Minimum	get the minimum density of the same spot of layers
Maximum	get the maximum density of the same spot of layers

Dots:

The density table after following processing (in order):

- Composition of multiple layers.

- Overall Density Multiplier**.**
- Overall Density Adder

Height: The height of light guide plate.

Width: The width of light guide plate.

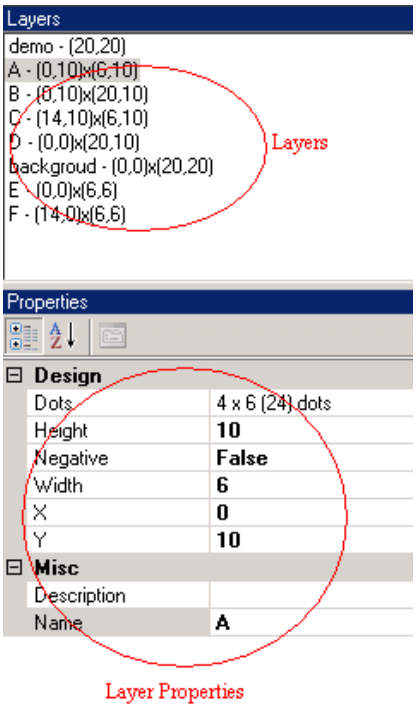
Overall Density Adder: Adding a density value (positive or minus) to the entire density result.

Overall Density Multiplier: Multiplying a factor to the entire density result.

Name: The name of the design.

Description: The description of the design.

Layer



Dots: The density table of the layer.

Negative: If true, the entire density table will be treated as negative values when doing layers composition.

X: The X position relates to Layer Container.

Y: The Y position relates to Layer Container.

Width: The width of the layer.

Height: The height of the layer.

Name: The name of the layer.

Description: The description of the layer.

Density and Design Lines

Density Adjusting Methods

Density values adjusting can be done using following methods:

- Menu: Layout->Adjust Density Values
- Menu: Layout->Adjust Density Gradiently
- Menu: Layout->Open Density Editor
- Modify density value in Current Density Dot Window

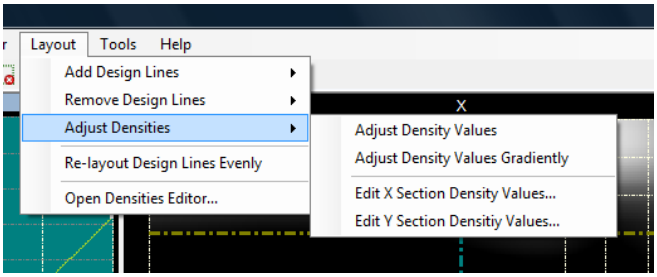


Figure 7 Menu: Layout->Adjust Density Values

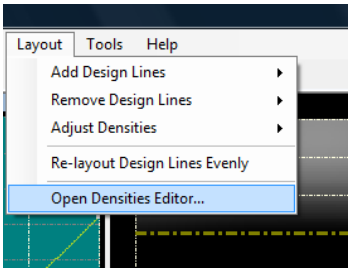


Figure 8 Menu: Layout->Open Density Editor

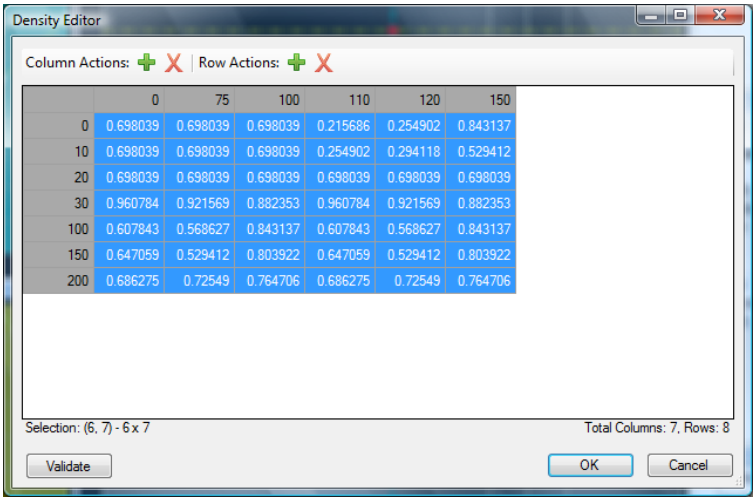


Figure 9 Density Editor

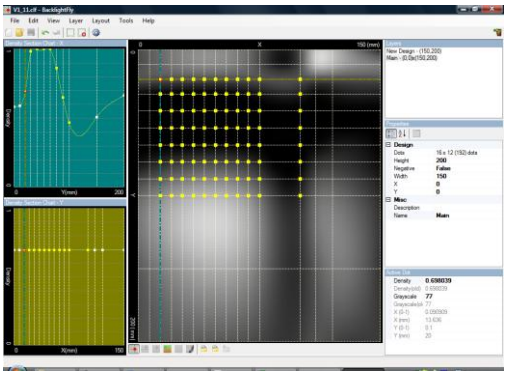


Figure 10Yellow: selected dots

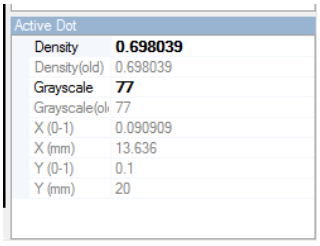


Figure 11 Active Dot Window

Add, Modify and Remove Design Lines

Layout design lines can be done using following methods:

- Menu: Layout->Re-Layout Design Lines Evenly.
- Menu: Layout->Add Design Lines.
- Menu: Layout->Remove Design Lines.
- Menu: Layout->Open Density Editor.

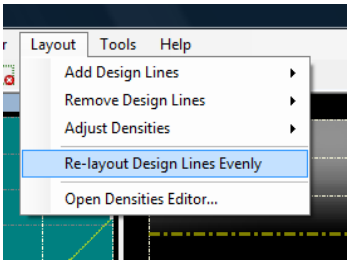


Figure 12 Menu: Layout->Re-Layout Design Lines Evenly

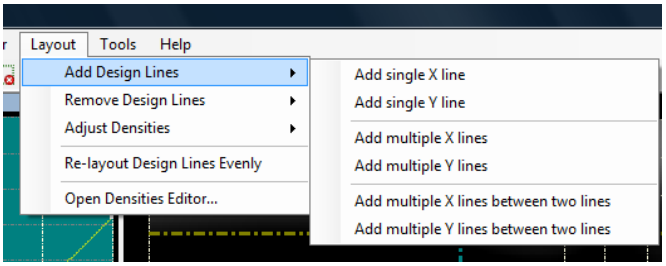


Figure 13 Menu: Layout->Add Design Lines

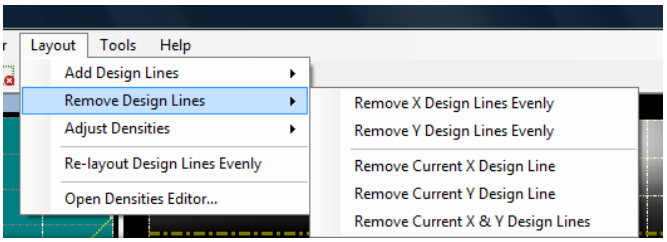


Figure 14 Menu: Layout->Remove Design Lines

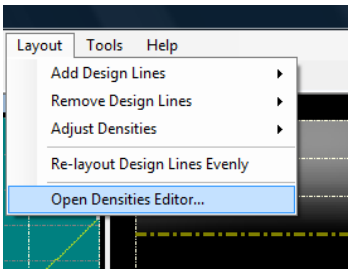
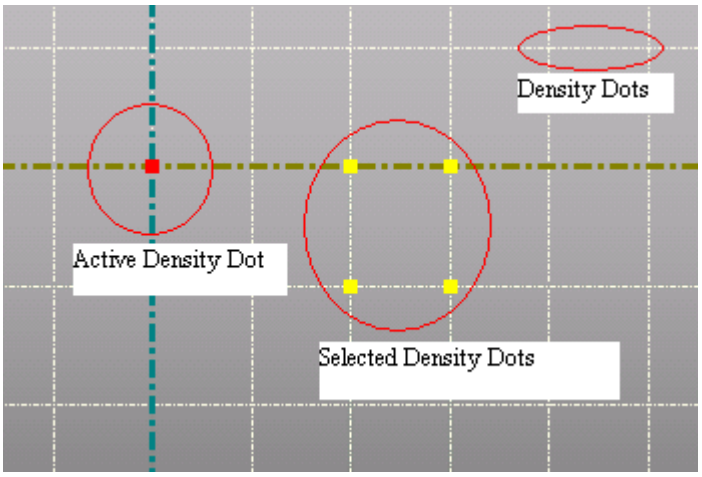


Figure 15 Menu: Layout->Open Density Editor

Density Dots



A density dot is created at each interaction of design lines and removed automatically when a design lines is removed.

Properties of an active dot can be observed at the Active Dot Window.

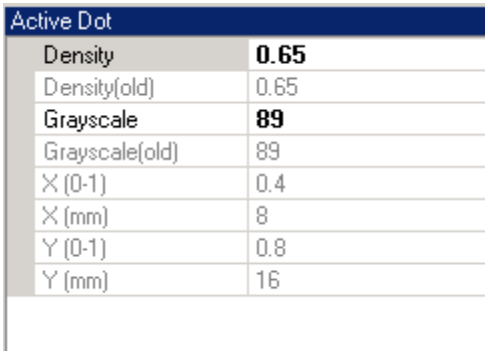
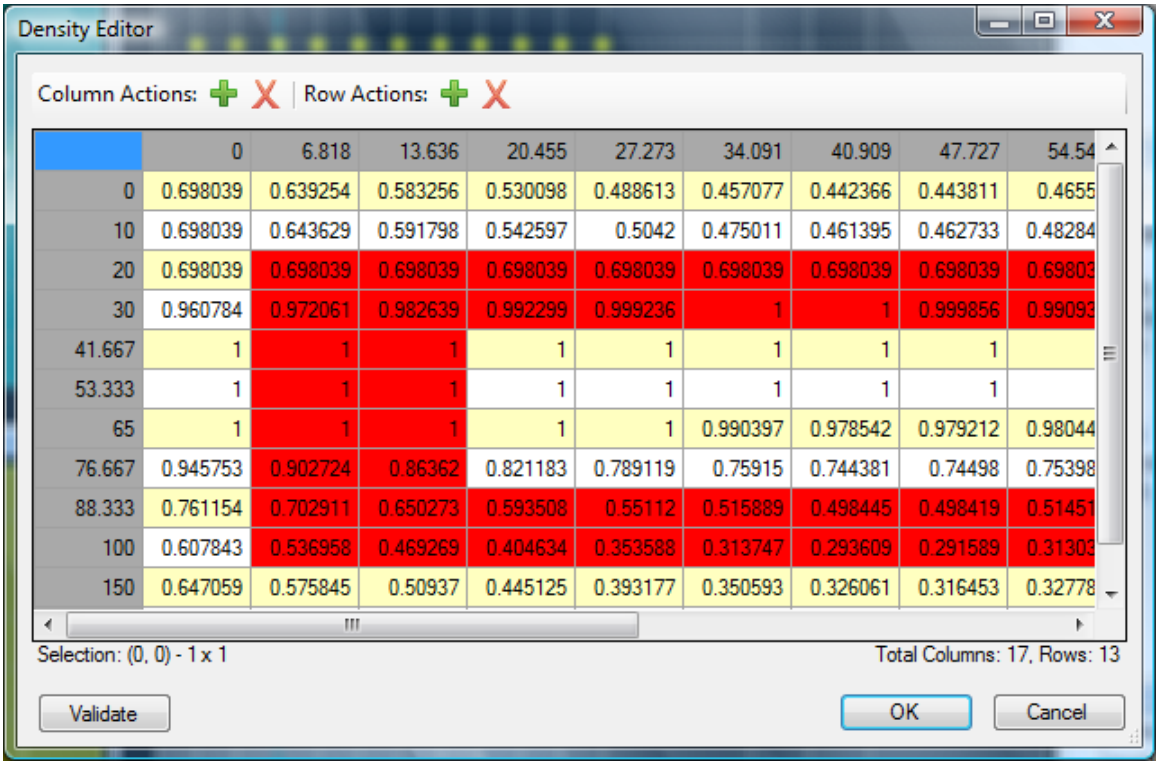


Figure 16 - Active dot window

Density Editor



	0	6.818	13.636	20.455	27.273	34.091	40.909	47.727	54.54
0	0.698039	0.639254	0.583256	0.530098	0.488613	0.457077	0.442366	0.443811	0.4655
10	0.698039	0.643629	0.591798	0.542597	0.5042	0.475011	0.461395	0.462733	0.48284
20	0.698039	0.698039	0.698039	0.698039	0.698039	0.698039	0.698039	0.698039	0.69803
30	0.960784	0.972061	0.982639	0.992299	0.999236	1	1	0.999856	0.99093
41.667	1	1	1	1	1	1	1	1	
53.333	1	1	1	1	1	1	1	1	
65	1	1	1	1	1	0.990397	0.978542	0.979212	0.98044
76.667	0.945753	0.902724	0.86362	0.821183	0.789119	0.75915	0.744381	0.74498	0.75398
88.333	0.761154	0.702911	0.650273	0.593508	0.55112	0.515889	0.498445	0.498419	0.51451
100	0.607843	0.536958	0.469269	0.404634	0.353588	0.313747	0.293609	0.291589	0.31303
150	0.647059	0.575845	0.50937	0.445125	0.393177	0.350593	0.326061	0.316453	0.32778

Gray Cells: Horizontal cells are the position of X design lines. Vertical cells are the position of Y design lines. The unit is percentage (0-1) or absolute (mm). For more about unit, please refer to topic: Unit.

Yellow/White Cells: The target density values. Users can specify target density values here. The unit is percentage (0- 1) or grayscale (0 – 255). For more about unit, please refer to topic: Unit.

Red Cells: The selected dots in design window will be highlighted as red color.

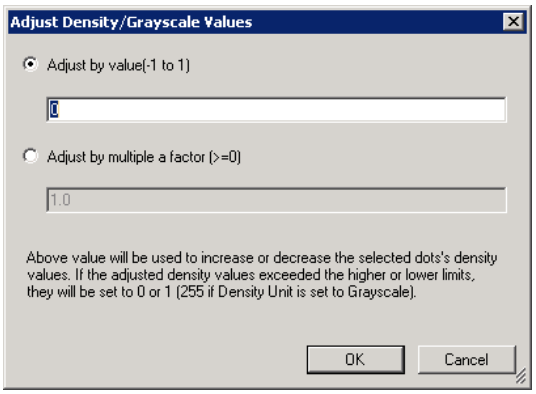
Validate: validates if the input values are correct.

Shortcut keys:

Ctrl + C: Copy

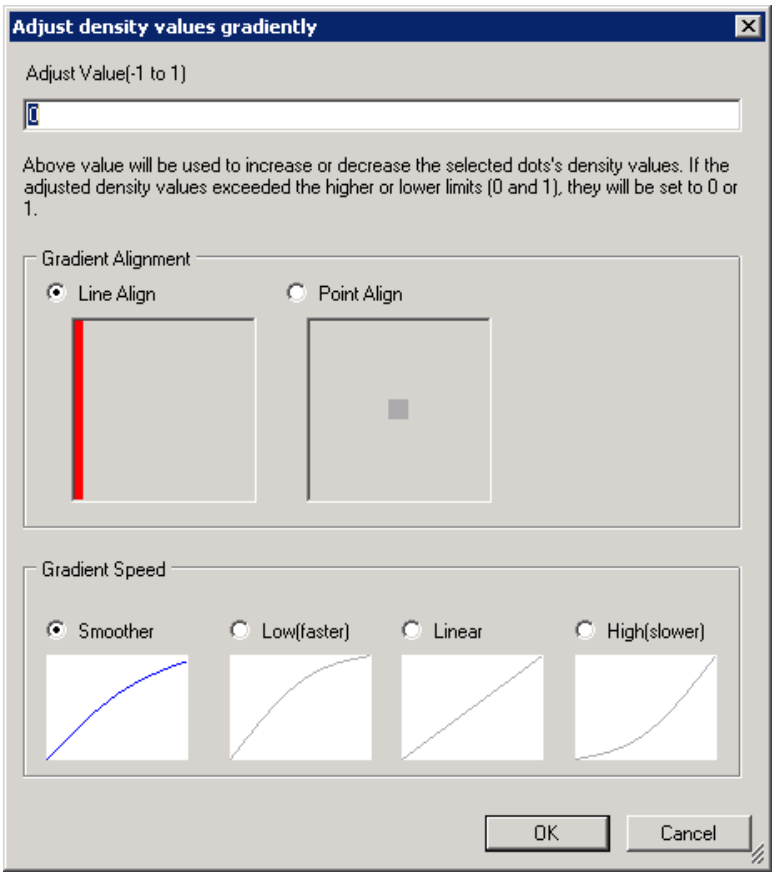
Ctrl + V: Paste

Adjust Density



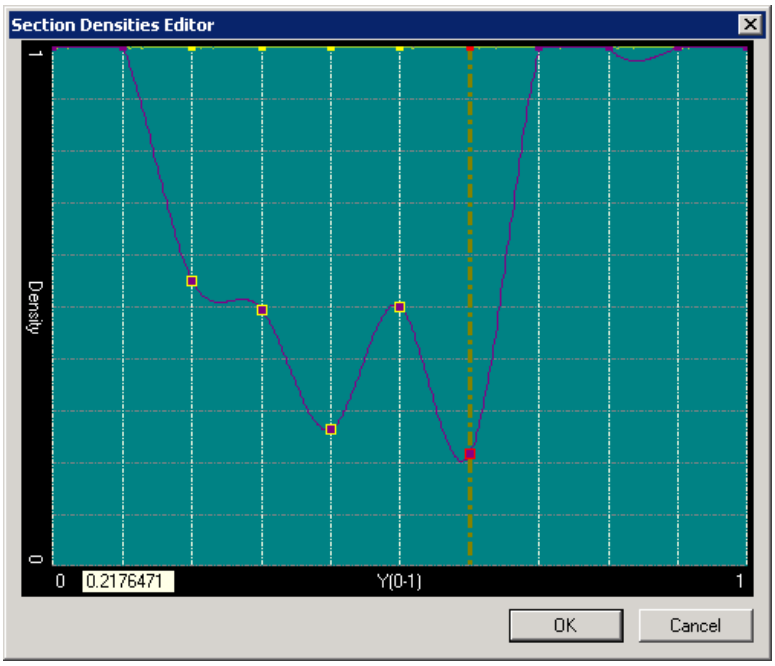
This method is used to adjust density by adding a value or multiplying a factor.

Adjust Density Gradiently



This method is used to adjust density while smoothing the density changing speed in nearby areas.

X/Y Section Density Editor



This method is used to adjust density by dragging selected density dots.

Usage:

- Mouse down and hold on Density Dot.
- Drag the density dot up or down or Up/Down key to adjust density value.

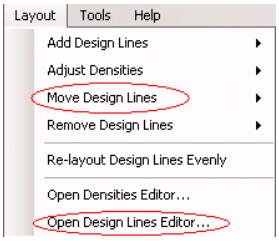
If you wish to drag multiple dots at a time:

- Left or Right key to navigate through density dots.
- Space to select or de-select density dots.
- Mouse Drag (while mouse down and hold) or Up/Down key to adjust density values.

Move Design Lines

Move design lines feature allow you to relocate design position without changing the current density distribution too much.

This feature can be accessed through Layout->Move Design Lines and Layout->Open Design Lines Editor…



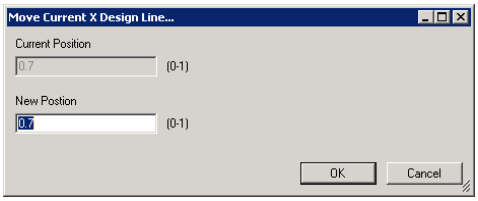


Figure 17 - Allow you to edit current X design line position.

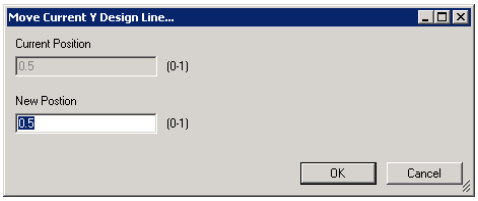


Figure 18 - Allow you to edit current Y design line position.

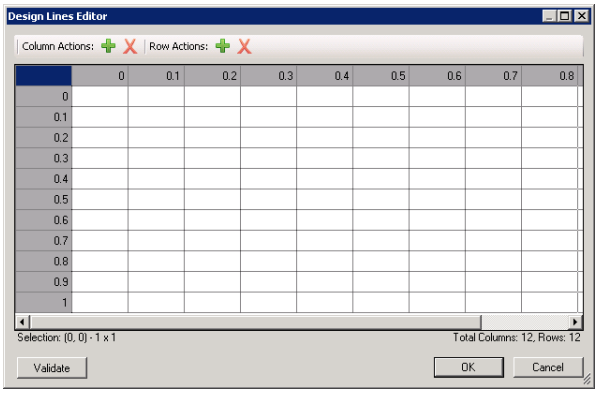


Figure 19 - Allow you to edit all design lines at once.

Mask

Mask feature allow you to cut or mask off shapes and text on the output results. This feature is located at the property window of design file.

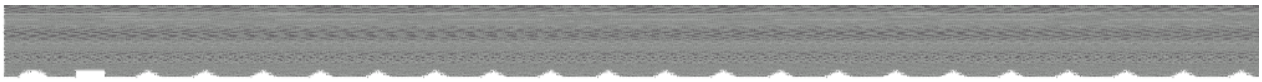


Figure 20 - a Mask applied grayscale image.

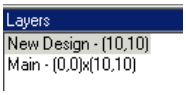


Figure 21 - Click on the design file to bring up property window

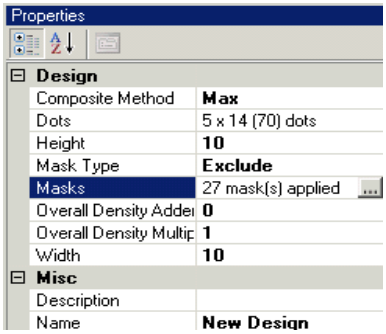


Figure 22 - Property window of design file.

	Shape Type	X	Y	Width	Height	Result Density	Font Size	Text	Angle
▶	Diamond	0.1851852	10	0.1851852	0.1851852	Min			0
	Diamond	0.5555556	10	0.1851852	0.1851852	Min			0

Figure 23 - Masks input table.

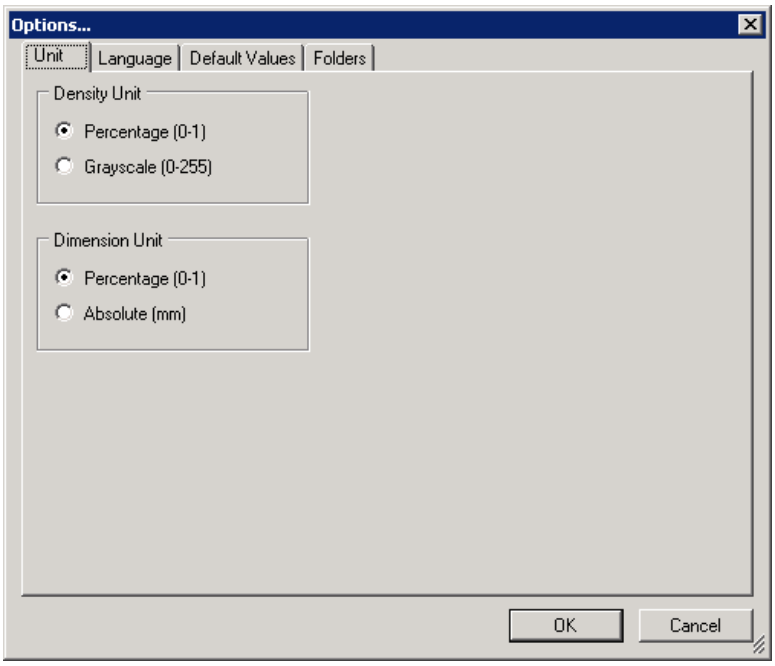
Mask Field Description

Field	Description
Shape Type	Diamond, Rectangle, Ellipse (also Circle), Text

X, Y	For Diamond, Rectangle and Ellipse, these two fields are the center location of the shape. For Text, these are the left-top corner position.
Width, Height	The dimension of shapes. For Text, these fields are ignored.
Result Density	Must be “Min”. Currently, only Min is supported.
Font Size	Font size in points.
Angle	Rotate angle.

Options

Unit

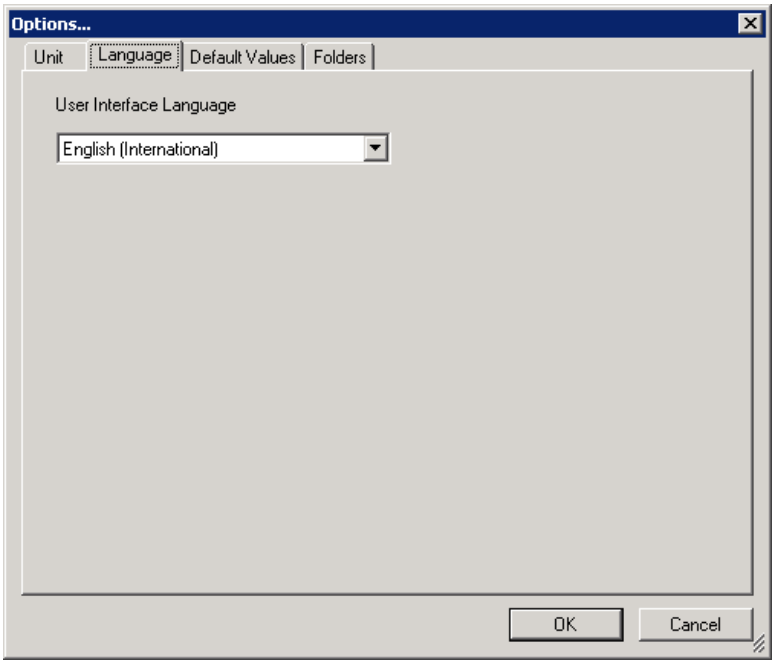


The Unit settings can be changed at Menu: Tools->Options->Unit.

Density Unit: density unit can be either percentage (0 – 1) or grayscale (0 – 255). When under percentage unit, higher values indicate bigger shapes or darker grayscale. When under grayscale unit, higher values represent smaller shapes or lighter grayscale.

Dimension Unit: dimension unit can be either percentage (0 – 1) or absolute (mm). When under percentage unit, the values represent the proportional position in the layer. For example: if the layer's width is 90mm. X=0.3 represents the X position at X = 27mm.

Language

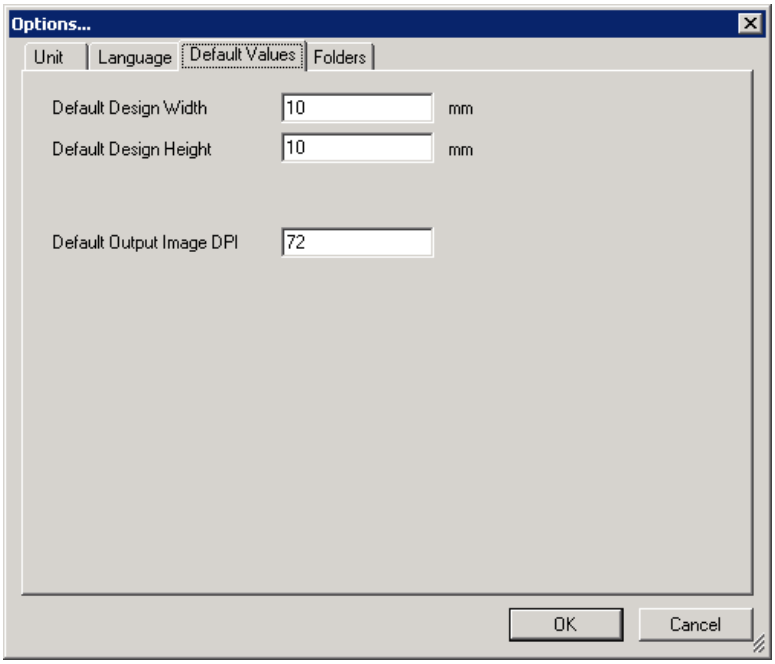


The Language settings can be changed at Menu: Tools->Options->Language.

Supported User Interface Languages:

- English (International)
- Chinese (Taiwan)

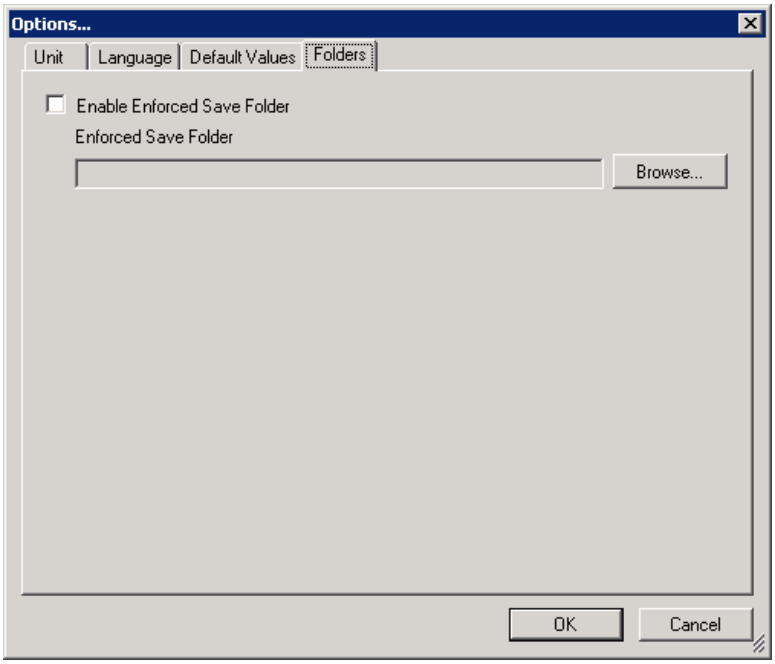
Default Values



The Default Values settings can be changed at Menu: Tools->Options->Default Values.

If you wish to change the default values of new designs, here is the place.

Folders



The Folders settings can be changed at Menu: Tools->Options->Folders.

Enable Enforced Save Folder:

If enabled, the save folder will be restricted to the specified folder and its subfolders.

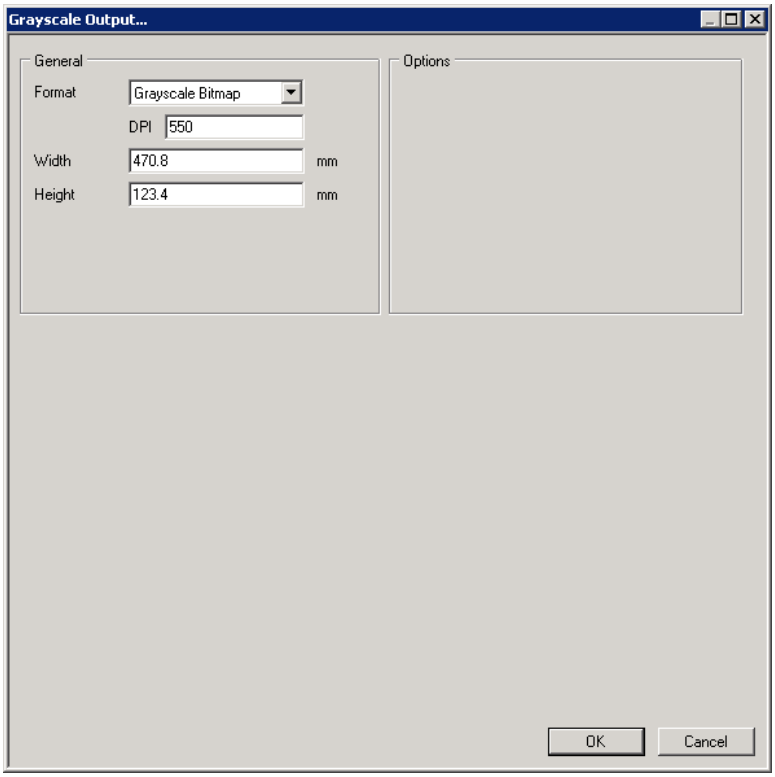
Output Methods

Grayscale Output

File->Output->Grayscale Output

Output density distribution using grayscale colors and densities (0-1) are normalized to grayscale values (0-255).

Settings



General

Format: The format of output files.

Width: The width of output files.

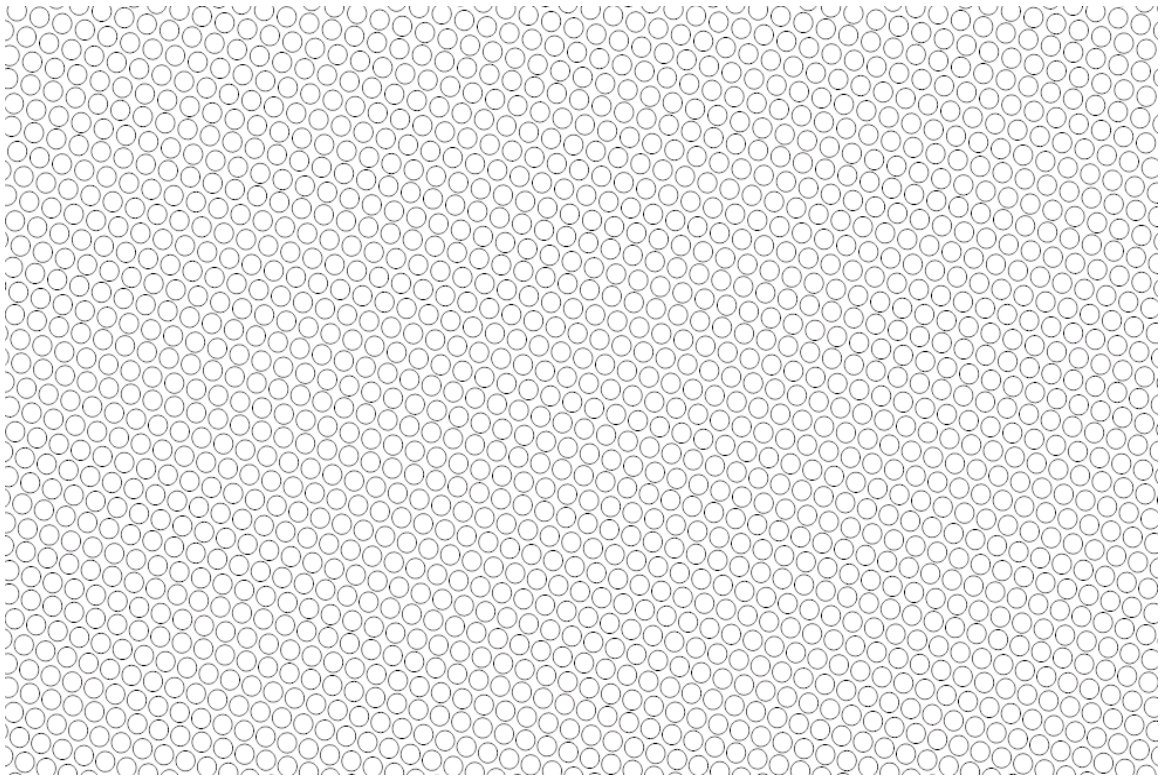
Height: The height of output files.

DPI: Pixels per inch. This option is only available when Format is Image. The actual image size is calculated as:

*Image Size (Pixels) = (Width / 25.4 * DPI) x (Height / 25.4 * DPI)*

How density values relate to grayscale values: When density value is 1, grayscale value will be 0. When density value is 0, grayscale value will be 1. For Density values between 0 and 1, the grayscale values will be proportional.

Array Output

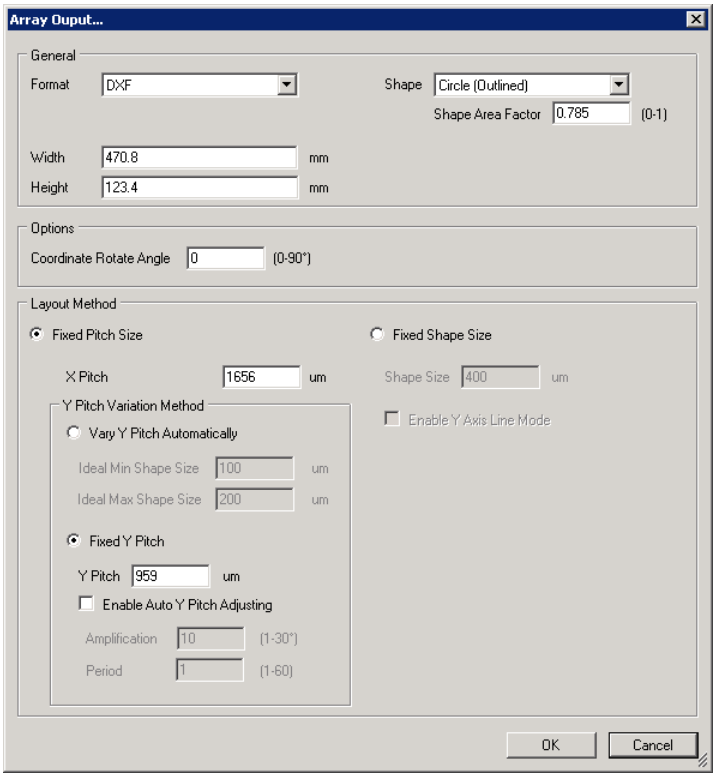


File->Output->Array Output

Array output uses modal-based algorithms to generate output results. The following rules can be expected at all time:

- Output density (area coverage rate) will be consistent with design density at all time.
- Output result is repeatable since it is modal-based.

Settings



General

Format: The format of output files.

Width: The width of output files.

Height: The height of output files.

Shape: The type of output shape.

Shape Area Factor: This factor is used to calculate the actual area of a shape. The value will be adjusted based on the shape type you selected automatically. In some cases, you may need to adjust this factor to get a different effect. Shape area is calculated as below:

*ShapeArea = ShapeAreaFactor * ShapeSize * ShapeSize*

DPI: Pixels per inch. This option is only available when Format is Image. The actual image size is calculated as:

*Image Size (Pixels) = (Width / 25.4 * DPI) x (Height / 25.4 * DPI)*

Options

Coordinate Rotate Angle: rotate the output coordinate by specified angle.

Layout Method

Fixed Pitch Method

Layout shapes using fixed pitch method. Both X and Y pitches can be specified.

X Pitch: X pitch value.

Y Pitch Variation Method

- **Vary Y Pitch Automatically**

  Allow output shape size controlled in reasonable ranges (i.e. to avoid over-size shapes or tiny shapes).

  Ideal Min Shape Size: Specify the ideal minimum shape size of output shapes.

  Ideal Max Shape Size: Specify the ideal maximum shape size of output shapes.

  Please note that if the ideal min shape size or max shape size does not have a mathematical solution, the actual output shape size will still exceeded the ranges in order to maintain precise output density.

- **Fixed Y Pitch**

  Traditional fixed pitch and vary shape size method.

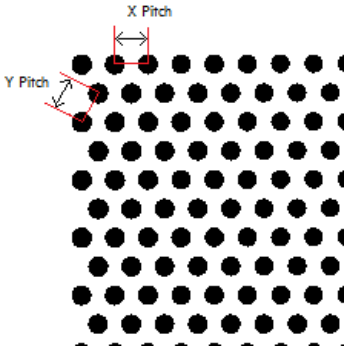
  Y Pitch: specify Y pitch.

  Enable Auto Y Pitch Adjusting: turn on or off auto Y pitch adjusting.

  Amplification: controls the maximum degree of Y pitch adjusting.

  Period: controls how many rows to complete a full amplification. The formula is defined as:

  Rows to complete a cycle = 360 / Period



Definition of X and Y Pitch

Fixed Size Method

Layout shapes using fixed size method.

Shape Size: the size of outputting shapes.

Enable Y Axis Line Mode: turn this option on to disable the Y direction vibration.

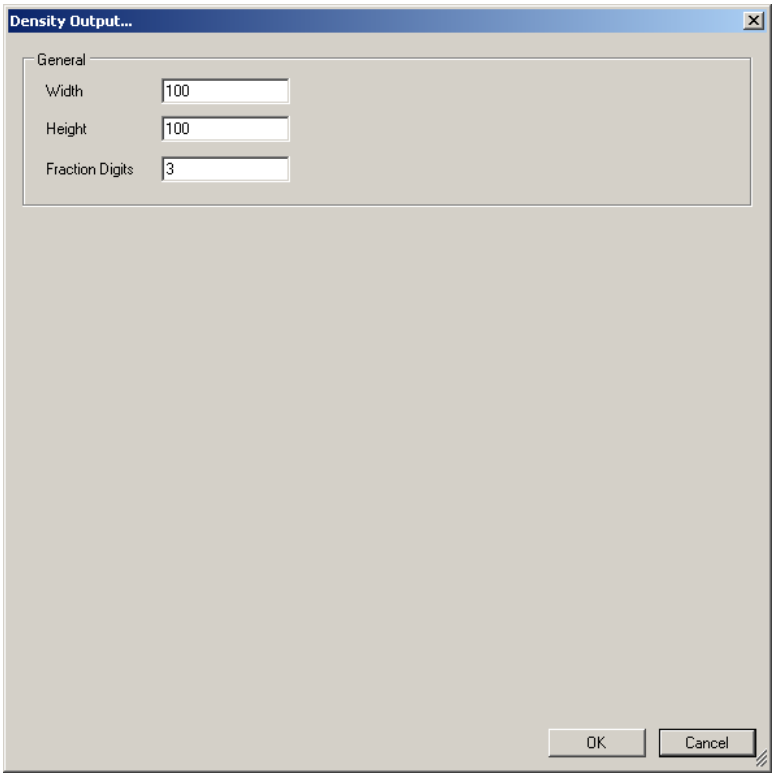
Density Output

Y\X	0	0.01	0.02	0.03	0.04	0.051	0.061	0.071	0.081	0.091	0.101	0.111	0.121	0.131
0	0.068	0.071	0.073	0.076	0.078	0.081	0.083	0.085	0.088	0.09	0.092	0.095	0.097	0.099
0.01	0.088	0.091	0.093	0.096	0.098	0.101	0.103	0.106	0.109	0.111	0.114	0.116	0.119	0.121
0.02	0.108	0.11	0.113	0.116	0.118	0.121	0.124	0.126	0.129	0.132	0.135	0.137	0.14	0.142
0.03	0.127	0.13	0.133	0.136	0.138	0.141	0.144	0.147	0.15	0.152	0.155	0.158	0.161	0.164
0.04	0.146	0.149	0.152	0.155	0.158	0.161	0.164	0.166	0.169	0.172	0.176	0.179	0.182	0.185
0.051	0.165	0.168	0.171	0.174	0.177	0.18	0.183	0.186	0.189	0.192	0.195	0.199	0.202	0.205
0.061	0.183	0.186	0.189	0.192	0.195	0.198	0.201	0.204	0.208	0.211	0.214	0.218	0.221	0.224
0.071	0.2	0.203	0.206	0.209	0.213	0.216	0.219	0.222	0.226	0.229	0.233	0.236	0.24	0.243
0.081	0.217	0.22	0.223	0.226	0.229	0.233	0.236	0.239	0.243	0.246	0.25	0.254	0.257	0.261
0.091	0.232	0.235	0.238	0.242	0.245	0.248	0.252	0.255	0.259	0.262	0.266	0.27	0.274	0.277
0.101	0.246	0.25	0.253	0.256	0.26	0.263	0.266	0.27	0.273	0.277	0.281	0.285	0.289	0.293
0.111	0.26	0.263	0.266	0.27	0.273	0.276	0.28	0.283	0.287	0.291	0.295	0.299	0.303	0.306
0.121	0.272	0.275	0.279	0.282	0.285	0.289	0.292	0.296	0.299	0.303	0.307	0.311	0.315	0.319
0.131	0.284	0.287	0.29	0.293	0.297	0.3	0.304	0.307	0.311	0.315	0.319	0.323	0.327	0.331
0.141	0.294	0.298	0.301	0.304	0.308	0.311	0.314	0.318	0.322	0.326	0.33	0.334	0.338	0.342
0.152	0.305	0.308	0.311	0.315	0.318	0.321	0.325	0.328	0.332	0.336	0.34	0.344	0.348	0.352
0.162	0.315	0.319	0.322	0.325	0.328	0.332	0.335	0.339	0.342	0.346	0.35	0.354	0.358	0.362
0.172	0.315	0.319	0.322	0.325	0.328	0.332	0.335	0.339	0.342	0.346	0.35	0.354	0.358	0.362
0.182	0.326	0.329	0.332	0.335	0.339	0.342	0.345	0.349	0.352	0.356	0.36	0.364	0.368	0.372
0.192	0.337	0.34	0.343	0.346	0.349	0.352	0.356	0.359	0.363	0.366	0.37	0.374	0.379	0.383
0.202	0.348	0.351	0.354	0.357	0.36	0.363	0.367	0.37	0.374	0.377	0.381	0.385	0.389	0.393
0.212	0.36	0.363	0.366	0.369	0.372	0.375	0.378	0.381	0.385	0.389	0.392	0.396	0.4	0.404
0.222	0.372	0.375	0.378	0.381	0.384	0.387	0.39	0.394	0.397	0.401	0.404	0.408	0.412	0.416
0.232	0.386	0.389	0.392	0.394	0.397	0.4	0.404	0.407	0.41	0.414	0.417	0.421	0.425	0.429

File->Output->Density Output

Density output is designed to output the current density distribution in grid form.

Settings



Width: number of columns to output.

Height: number of rows to output.

Fraction Digits: maximum fraction digits.

Output File Formats

BacklightFly supports multiple output formats. If the current formats do not meet your needs, please contact us.

Supported Formats:

- DXF
- EPS
- Gerber
- Image
- Standard Laser
- Standard Laser w/ Origin Offset
- LightTools(Text)
- SPEOS (Text)
- Text Coordinate
- TracePro(Text)

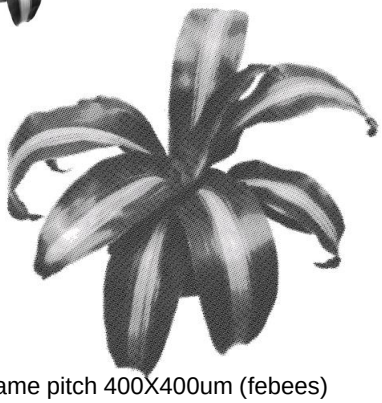
Materials

- Quick Start Guide
- Example – 3 LED LG

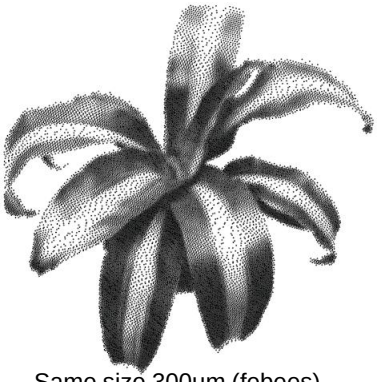
Quick Start Guide

Quick Start for BackLight Fly

Image (100mmX100mm) from Michael Balzer (internet)



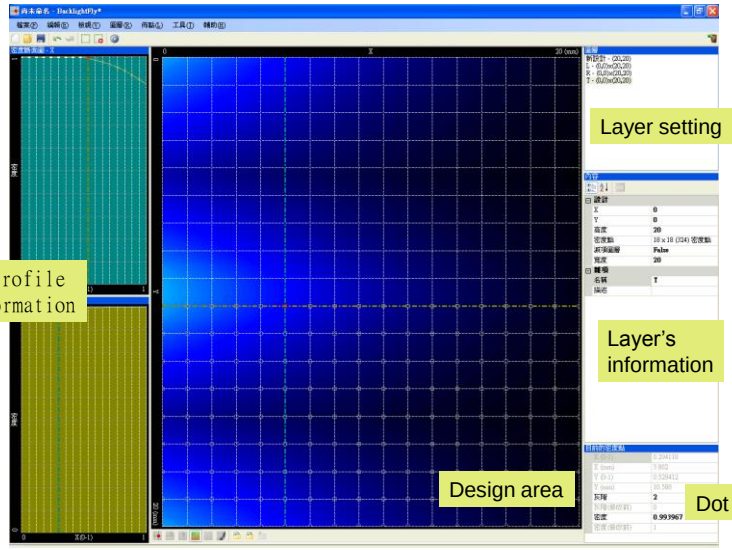
Same pitch 400X400um (febees)



Same size 300um (febees)

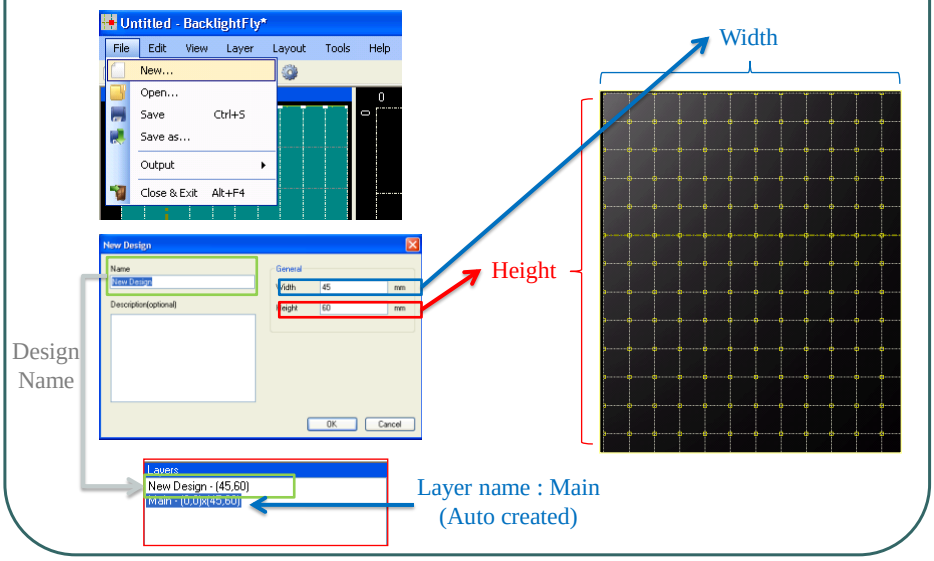
2009/05/18 Febees! SOFTWARE

Software overview



Febees! SOFTWARE

Create a new design file



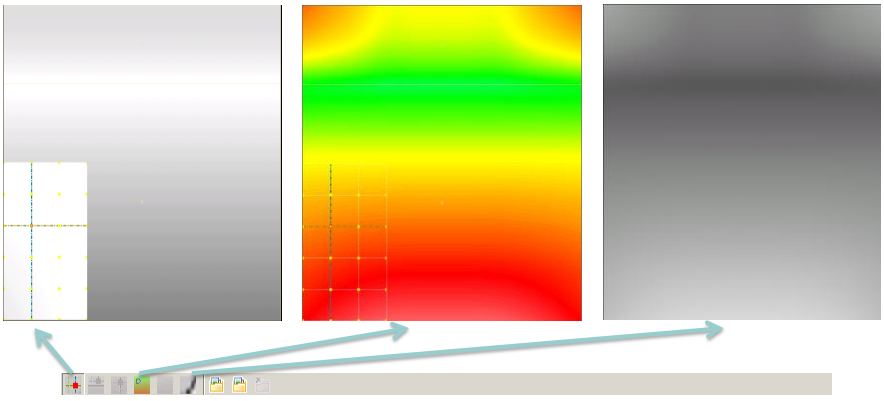
Febees! SOFTWARE

Choose suitable mode to design and check

Design mode:
editable in active layer
Active layer gray level result

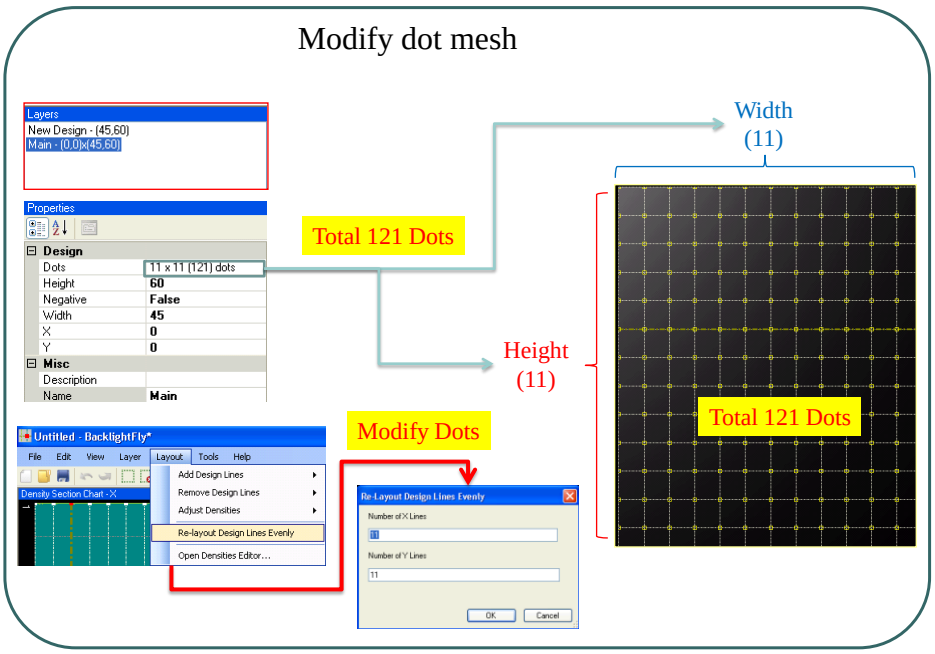
CCD mode:
editable in active layer
Composite color result

Gray level mode:
Non-editable
Composite final result

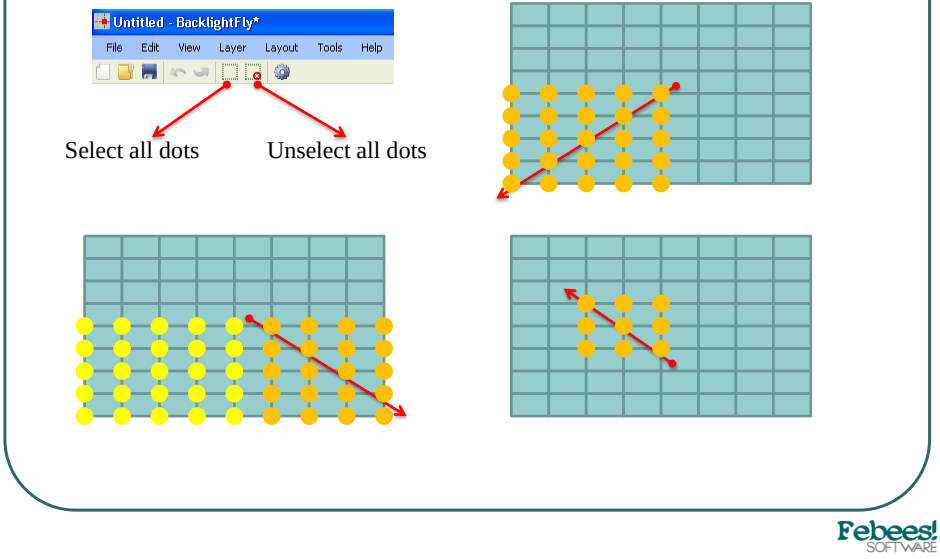


Febees! SOFTWARE

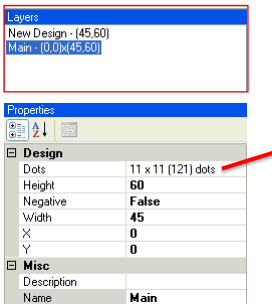
Modify dot mesh

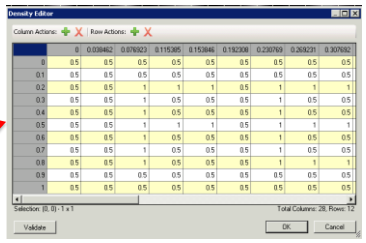


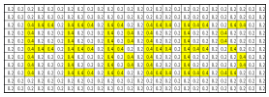
Select dots in special area



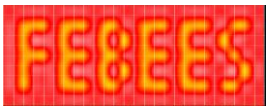
Input density table directly or paste from excel



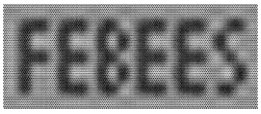




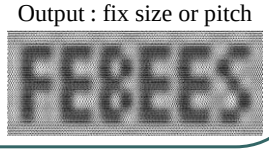
Density table



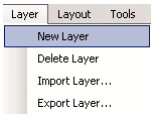
Design PreView

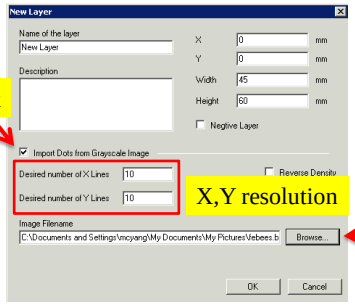


Output : fix size or pitch



Import from external graph file (mesh mode)





Click

X,Y resolution

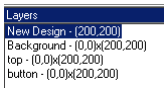
Browse

Output : fix size or pitch

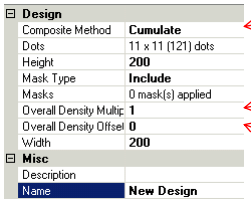
Import file

Design PreView

Composite layers



Project

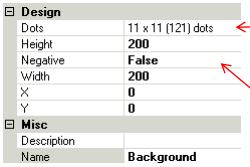


Operation of multi-layers

Final multiplier factor

Final offset factor

layer



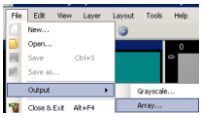
Click for density table

False as "-"
True as "+"

Design output=Operation of multi-layers(+/-layer 1….+/-layer n)
***Final multiplier factor + Final offset factor**

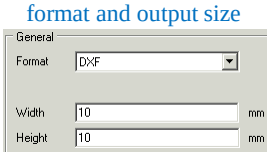
Febees! SOFTWARE

Property of same size output

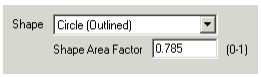


File/Output/Array

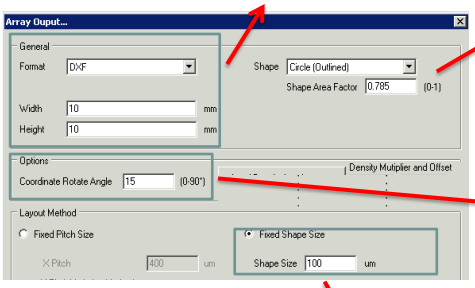
Choose right output format and output size

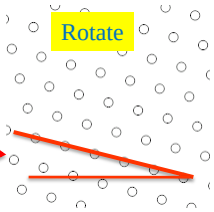


Choose dot pattern and right shape area factor



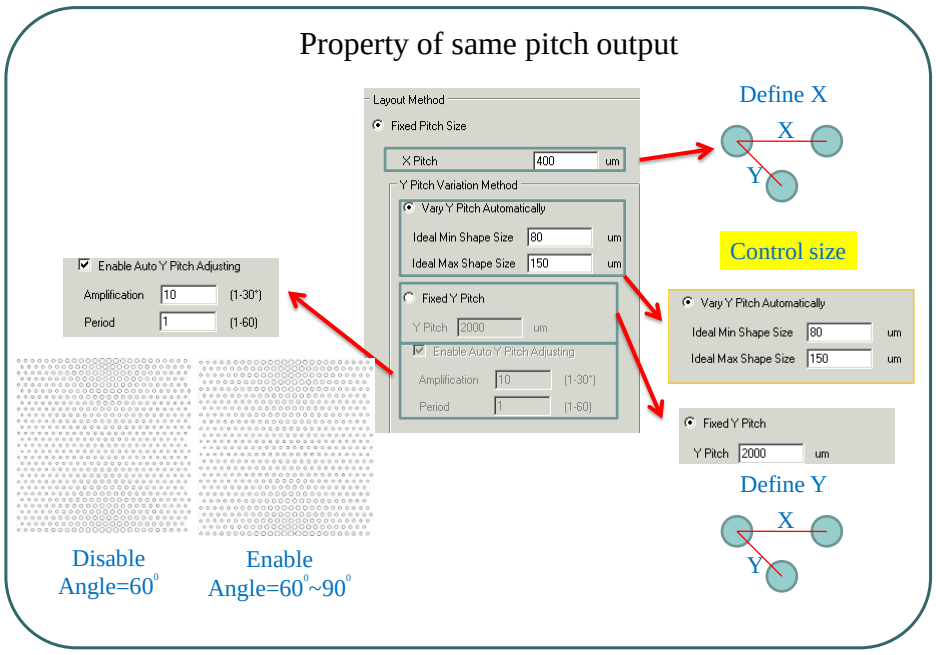
Square SAF=1
Circle SAF=0.785

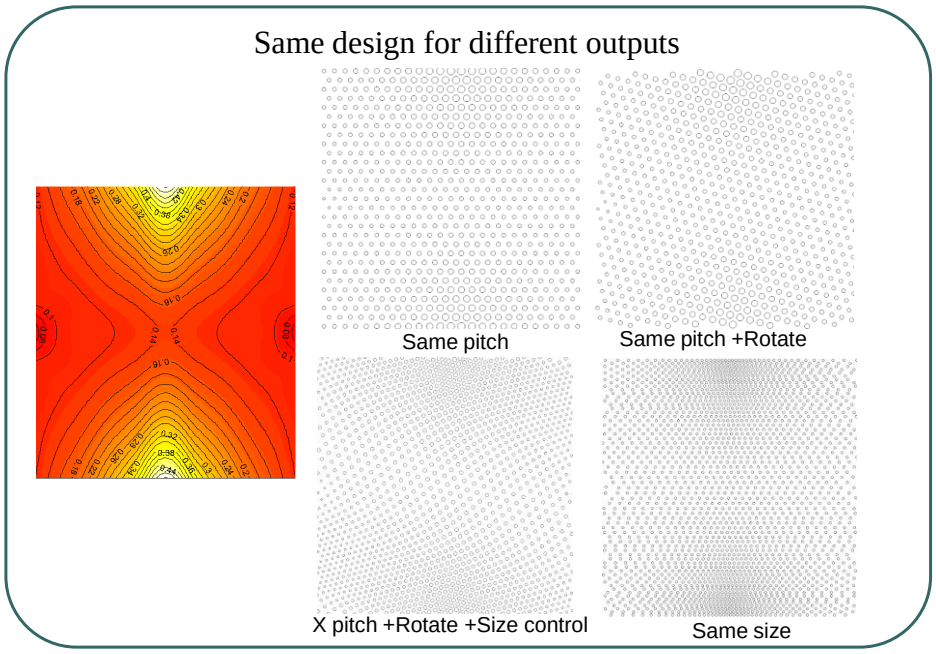




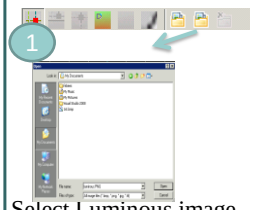
Define Square width

Febees! SOFTWARE

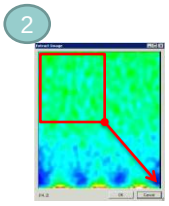

Property of same pitch output
Layout Method
Fixed Pitch Size
X Pitch 400 um
Y Pitch Variation Method
Vary Y Pitch Automatically
Ideal Min Shape Size 80 um
Ideal Max Shape Size 150 um
Fixed Y Pitch
Y Pitch 2000 um
Enable Auto Y Pitch Adjusting
Amplification 10 (1-30°)
Period 1 (1-60)
Define X
X
Y
Control size
Vary Y Pitch Automatically
Ideal Min Shape Size 80 um
Ideal Max Shape Size 150 um
Fixed Y Pitch
Y Pitch 2000 um
Define Y
X
Y
Disable
Angle=60°
Enable
Angle=60°~90°


Same design for different outputs
Same pitch
Same pitch +Rotate
X pitch +Rotate +Size control
Same size

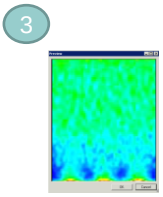
Data comparison



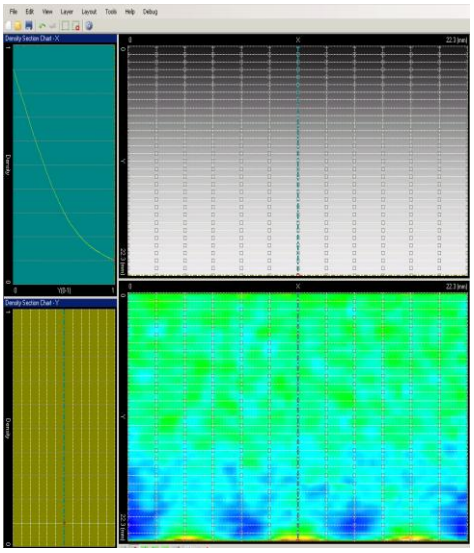
Select Luminous image



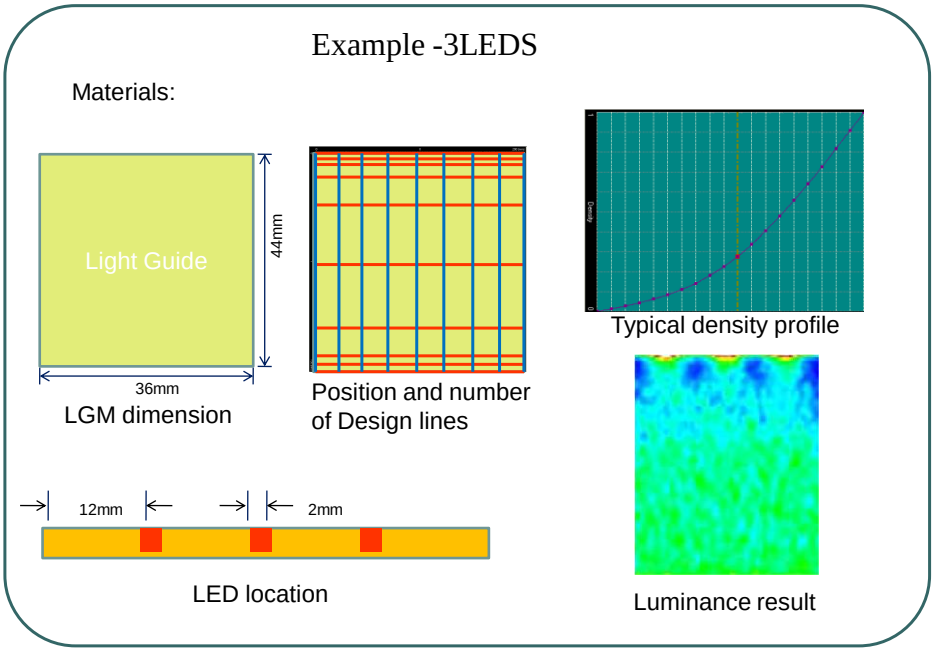
Hold mouse to select active area

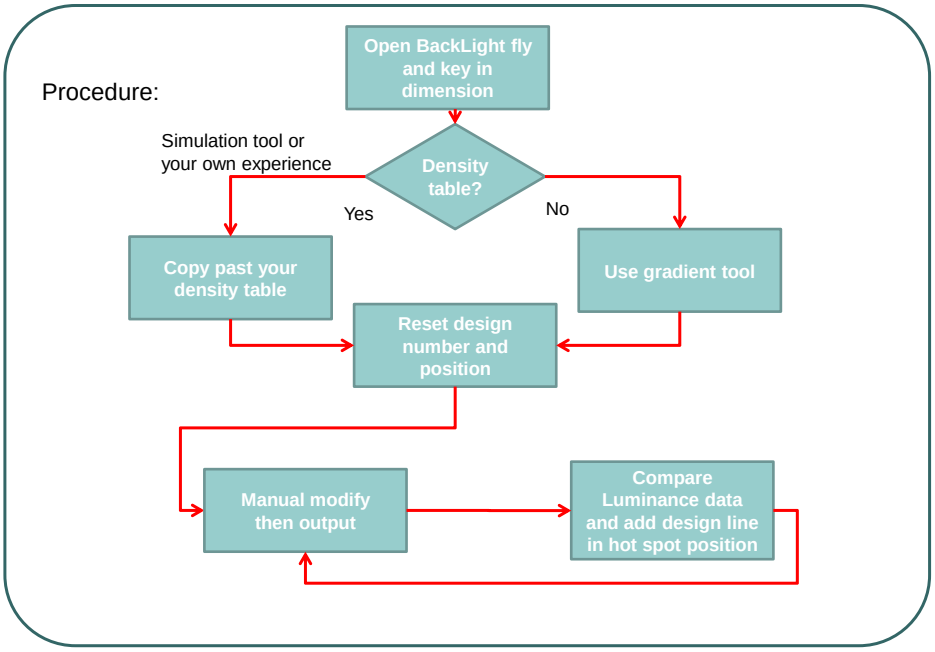


Click OK

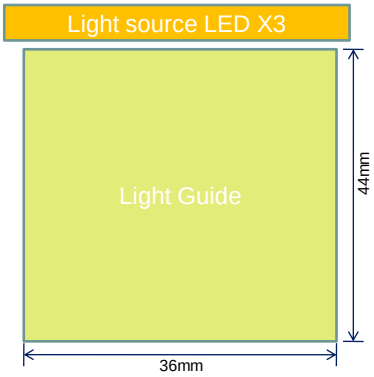


Example – 3 LED LGP

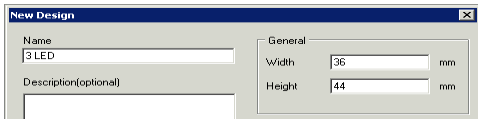




Open BackLight fly and key in dimension



Open new project and key in X,Y dimension



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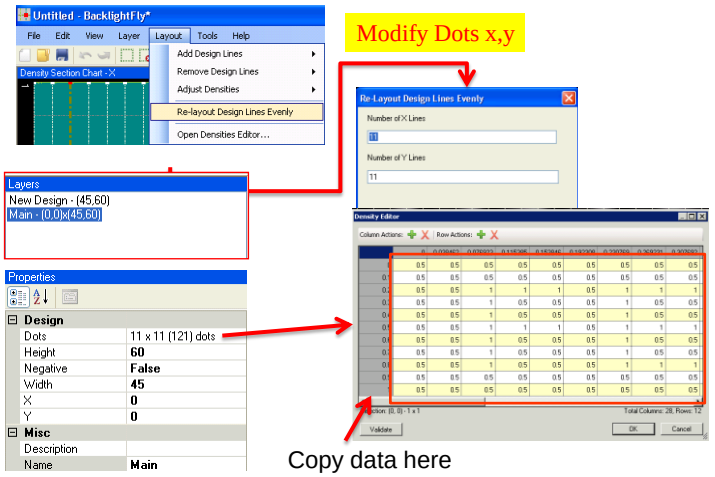
Copy past your density table



Copy data here

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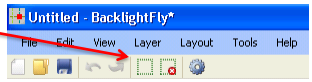
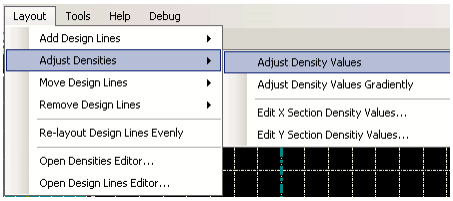
Use gradient tool

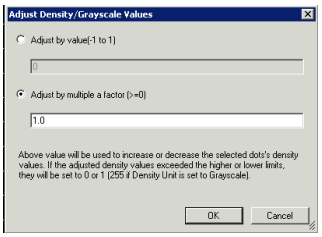
(ex. LED side 0.5% far end 65%)

•Select all dots

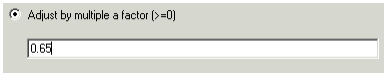


•Choose adjust density/Adjust Density Value





•Select Adjust by multiple factor to max density

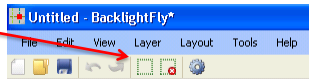


System default=1, so 1*0.65=0.65

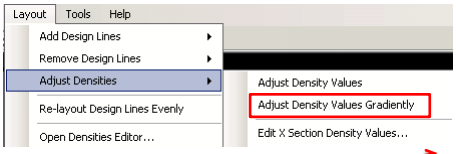
Use gradient tool

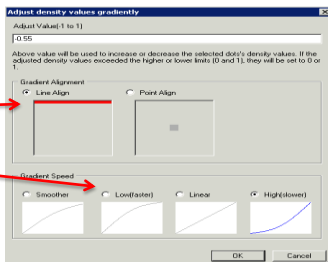
(ex. LED side 0.5% far end 65%)

•Select all dots



•Choose adjust density/Adjust Density Value Gradiently



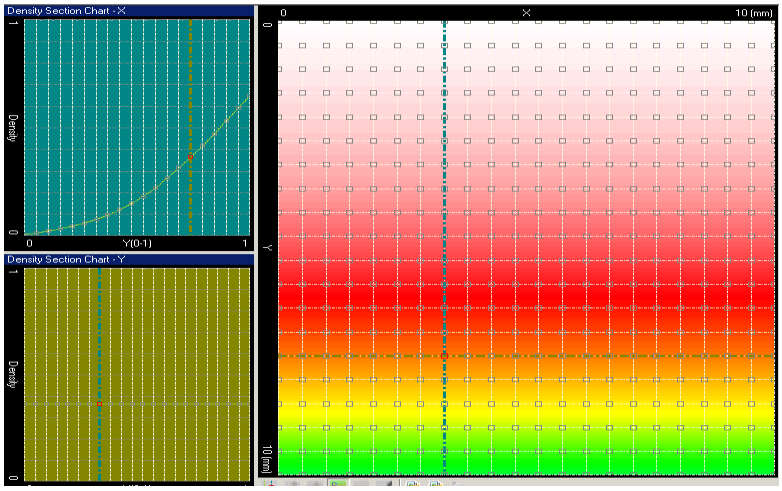


•Type -0.6 in adjust value
Choose line align from top
Select proper gradient speed

Max D=0.65, so top is 0.65-0.645=0.05
Far end =0.65-0=0.65

Use gradient tool

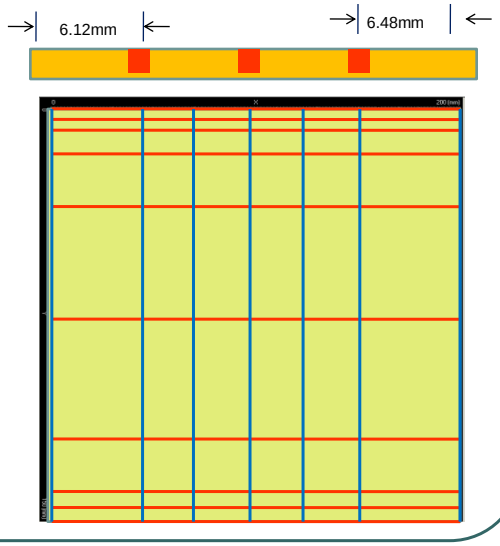
You got similar density map



Reset design number and position

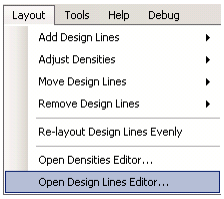
Define X design lines according LED position (total 10)
{
0,0.01,0.02,0.1,0.2,0.5,0.8,0.96,
0.98,1
}

Define Y design lines according density profile(total 7)
{
0,0.17,0.33,0.5,0.66,0.82,1
}

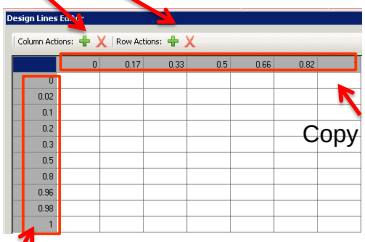


Reset design number and position

•Set design line X as 10 and Y as 7



Press "+ "and "X" to add or delete design lines till X=10 and Y=7



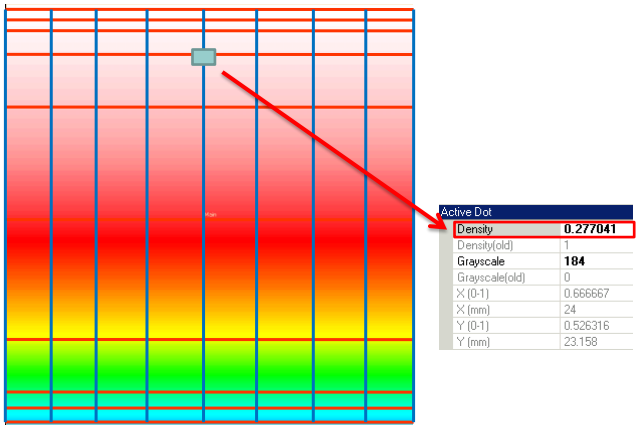
Copy X here

•Directly copy coordinator to density lines table

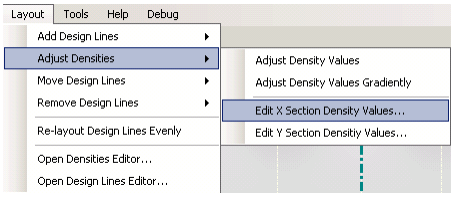
Copy Y here

Manual modify then output

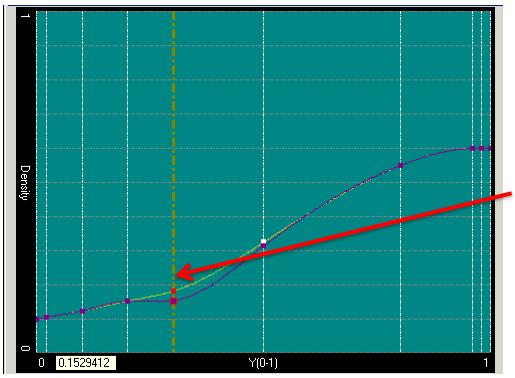
•Click cross of design lines and key in new density in active dot window



Check profile



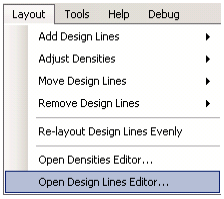
•Open X/Y section density editor to keep density profile smooth



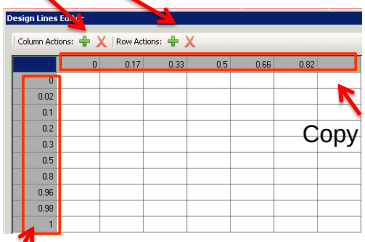
Press and move mouse to adjust profile

Reset design number and position

•Set design line X as 10 and Y as 7



Press "+ "and "X" to add or delete design lines till X=10 and Y=7



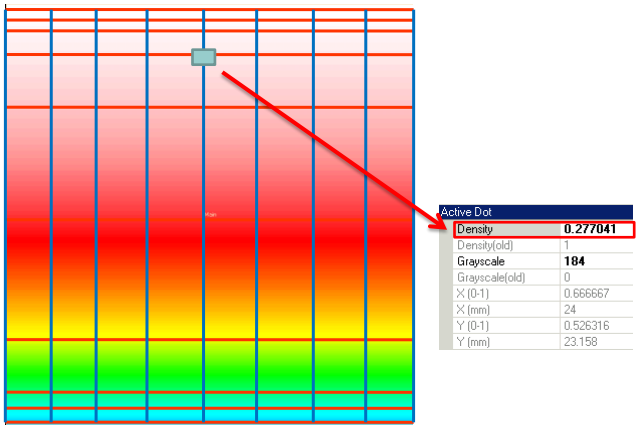
Copy X here

•Directly copy coordinator to density lines table

Copy Y here

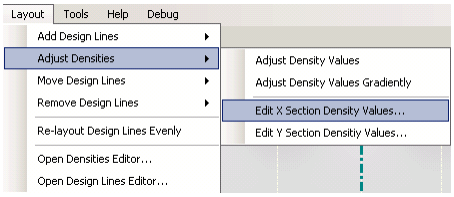
Manual modify then output

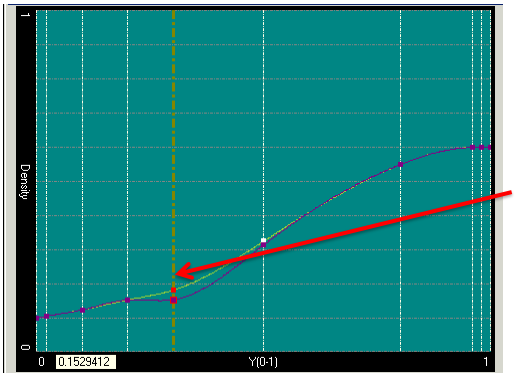
•Click cross of design lines and key in new density in active dot window



Check profile

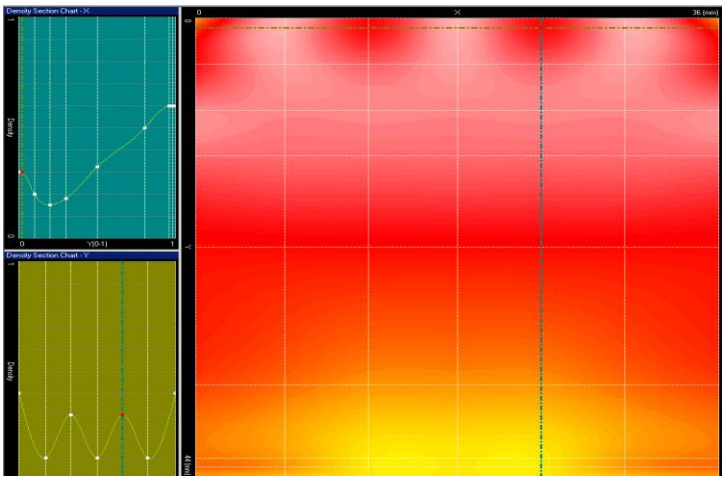
•Open X/Y section density editor to keep density profile smooth





Press and move mouse to adjust profile

•Final Design



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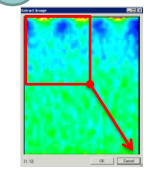
Compare Luminance data and add design line in hot spot position

1

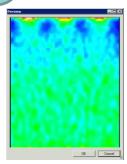
Select Luminous image

2

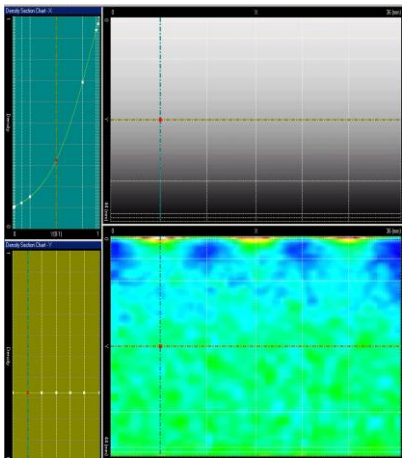


Hold mouse to select active area

3



Click OK



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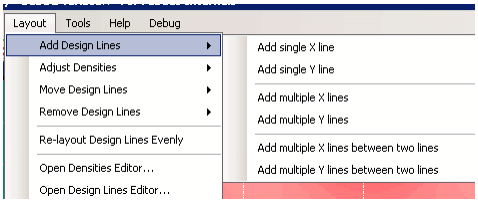
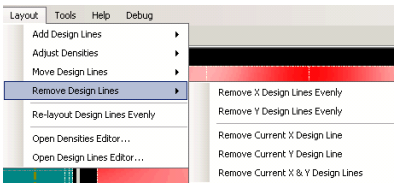
Compare Luminance data and add design line in hot spot position

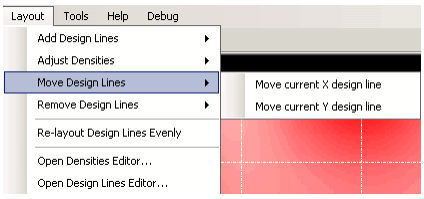
•You can add , delete or move density lines to align bad luminance area.



Add density line functions

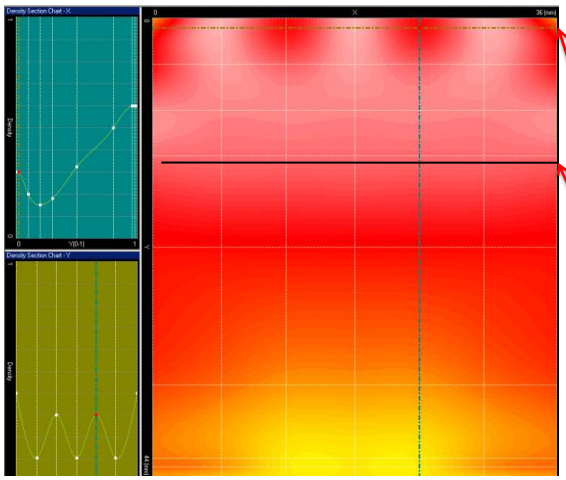


Remove density line functions



Move density line functions

Compare Luminance data and add design line in hot spot position



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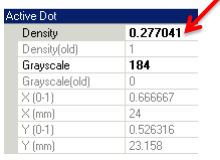
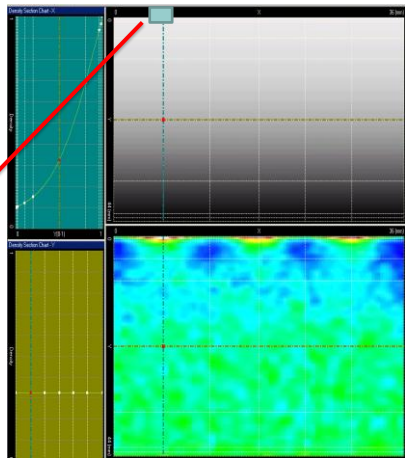
Compare Luminance data and add design line in hot spot position

•Click cross of design lines and key in new density in active dot window





The luminance data is copy from internet and this case is just for reference not real data.

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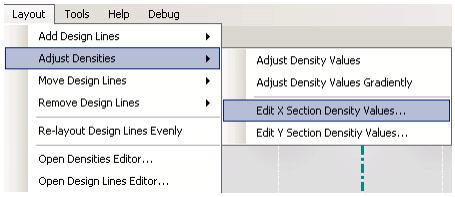
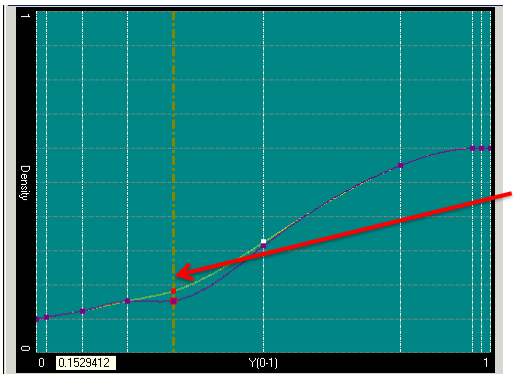
Compare Luminance data and add design line in hot spot position



•Open X/Y section density editor to keep density profile smooth



Press and move mouse to adjust profile

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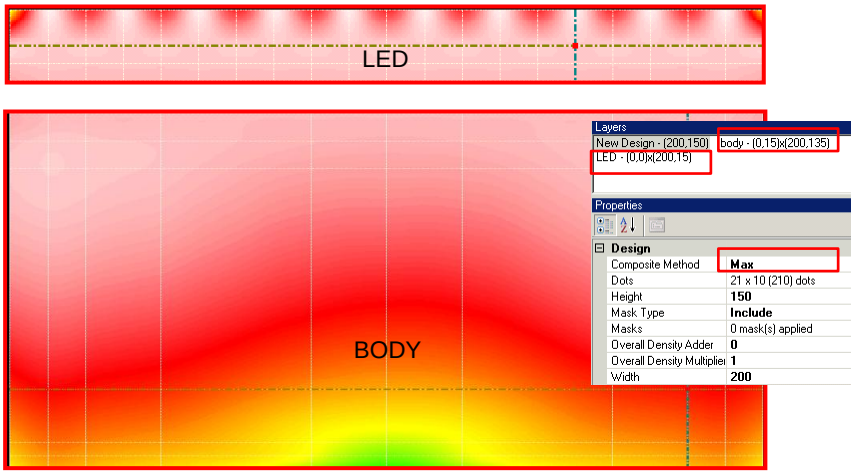
Advance –Tip1 for complex design

•Split your design to multiple layers(LED+Body)



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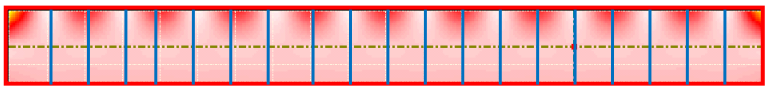
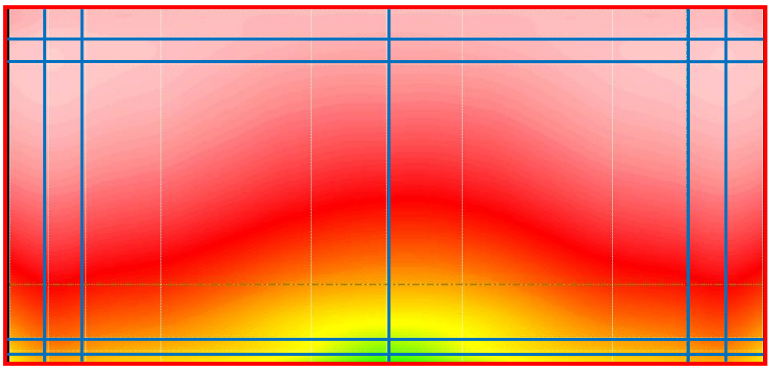
Advance –Tip2 put design lines at right place



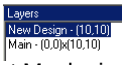
We normally put lines at center of LED and between in LED layer.



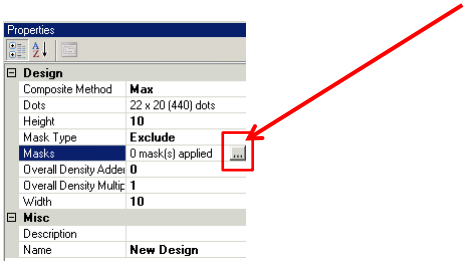
We put more lines is dramatic density change area

Advance –Tip3 mask function

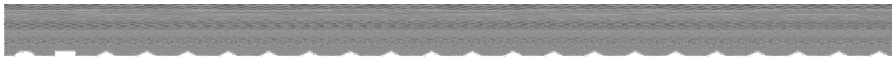
•Select main project in Layers window



•Select Masks in property window then click here

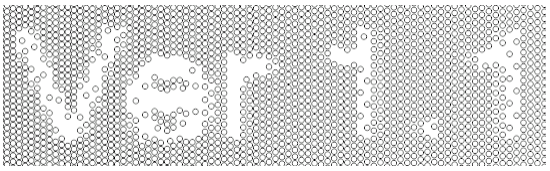


Advance –Tip3 mask function



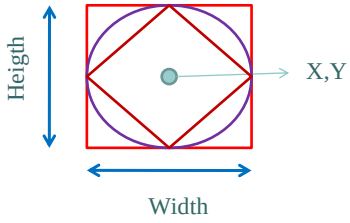
mask LED side dots

You can choose Circle, Ellipse ,Text and Diamond as mask shape



Edit mask table like this

Shape Type	X	Y	Width	Height	Result Den
Ellipse	1.499994	44	2	2	Min
Rectangle	4.5	44	2	2	Min
Diamond	7.500006	44	2	2	Min



Q & A

Q1：Why does BackLight FLY use density as design principle？

A：Light travelling pattern in LG (light guide) is as total reflection; this, we need dots on the LG to break total reflection and let light come out. It is clear that luminance is function of light intensity and dot density; therefore, there is no doubt that density is the best way to design LG dots.

Q2：How to design “design lines”？

A：We use dots, auto generated at the cross of design lines, to control density distribution. Any times you change dot values it will automatically recalculate density map by cubic function to keep density map smooth. In dramatic density change area (LED or edge sides), you need more design lines for better control and less in other area (center of LG)

Q3：How to adjust design lines？

A：We provide reset, add, delete, move and edit functions. It should cover all actions of design lines.

Q4：How to change dot value？

A：You can change value in active dot window directly. To do this, select dots and do multiple or adjustment or select more than 3X3 dots and do a gradient adjustment.

Q5：How to make sure that density profile is smooth？

A：Basically, we will smooth the density by cubic function. Cubic function guarantees piece-wise smooth; however, it is not enough to satisfy LG design needs. So you still need to check each design line’s profile in the left window (X, Y profile) and make them fully smooth. You can archive this by just adjusting dot value or open profile chart and use mouse to drag design line smooth.

Q6：What is the design difference between same pitch and same size output？

A：Density design is independent with output format. So you can use same design file for different processes. For example you can use same pitch experience (etching) to same size process (laser).

Q7：What is the definition of density？

A：It is very straight forward that density means dots area divide total area (area of coverage). The resolution is relate to pitch or size setting in your output.

Q8：How to adjust dot size in same pitch output？

A：You can use CAD tool to adjust output DXF file, but it is not necessary. Actually you just need to adjust density and system will adjust size according to density.

Q9：What is the dimension unit？

A：The dimension unit default is 0~1. You can switch to real design dimension in main menu tools/options.

Q10：When I adjust some dot values, why it sometimes causes other changes？

A：We use 5 points to do a piece-wise-smooth curve fitting, when a value is raised or lowered dramatically, it is necessary to change the curve style in order to keep up the smooth. To avoid this, you can add some design lines as guard band to eliminate this issue.

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