

To avoid confusion, from now on, I will refer to this software as WinGP, as found in the "wingp_5.2.6.2_PrintAll_ICM.zip" file from the Google Code website.

INK LIMITING

WinGP has default ink limits in the XML files describing each printer/paper. These are from the original Gutenprint team and the Linux distribution. Remember, Gutenprint was originally established as a universal printer driver for Linux and related OSs because many OEMs wouldn't support drivers for these OSs. You can usually achieve very good results using these defaults, turning off all color management within the software and creating custom profiles.

There are several flavors in deciding ink limits. The first is MAXIMUM CHROMA. We need to measure the four ink colors (usually CMYK) at different ink densities and derive the chroma values from our measurements. To do this we would tick the check box to the left of the Cyan, Magenta, Yellow and Black Density sliders. These are located on the Output/Adjust Output screen.

You can either use the slider or directly enter values into the numerical box. There are internally set ink densities in the XML files for each printer/paper which are brought out to this screen as default as 1 equalling their internal density.

Default menu settings when determining ink densities.

On the Printer Settings Screen:

Print Quality = Manual Control

Media Type = Your Choice, primarily determines preset ink limits, GRCs and the like

Media Source = Your Choice, printers with multiple paper paths, pick the appropriate one

Ink Set = Typically the "Standard Inks"

Resolution = Your Choice, the decision made here must always be used for this printer setup

Printing Direction = Unidirectional is typically better but Bidirectional is faster

Ink Type = Standard unless you understand the others and want to use a "custom" inkset

Quality Enhancement, Print Method, Platen Gap and others are printer specific and not well documented.

On the Adjust Output/Print Color adjustment screen:

Color Correction = Uncorrected

Image Type = Manual Control

Brightness, Contrast and Saturation all = 1

Dither Algorithm = Your choice, but I pretty much use Adaptive Hybrid for everything

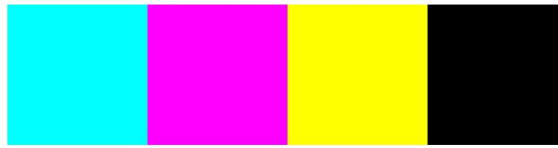
Cyan, Magenta, Yellow and Black Density = unchecked is using the default preset limits within WinGP, checked allows you to manipulate each color ink channel density (a value of 1 means no change from defaults)

Density = Unchecked, Global color ink density adjustment

Leave all other boxes unchecked for now and use the established default settings

Let me emphasize that most of these settings slightly vary the output color. It is important to choose your settings and do not change them throughout the setup for these will be the settings used when printing.

0,255,255 255,0,255 255,255,0 0,0,0



You need to create a target like this with patches large enough to measure with your device. When I use this method, I typically start at all ink colors = .5 and print it out. Then I increase all colors by .1 and print again until I am up to 1.5 or so. Remember, you will have to decide on the paper type, resolution, print direction and other parameters on the first menu along with setting others to no color manipulation as I explained earlier, before doing this.

I typically use my Colormunki and Argyll with the spotread command to do the reading. I have spotread save the measured results to a file. Typically “spotread -v yourfilename.txt” (without the quotes). This file can then be opened in a spreadsheet program (I use Excel). The results are in Lab. To determine the chroma values I use the formula “=sqrt(a^2+b^2). Chroma is the Euclidean distance between a and b in Lab or the square root of the sum of the squares of the a and b values). You need to choose the ink density where any increase in ink density produces little or no increase in chroma. The exceptions here are for black, where we are looking for the lowest L value before an increase in ink doesn’t produce that much change and yellow, where we are only concerned with the maximum b value. It’s a little bit iffy, but there is really no definitive answer here.

These ink densities are then entered into WinGP, you make up your profiling targets and print, measure and profile.

DENSITY	L	a	b	CHROMA	VALUE CHOSEN
0.5	32.69519	0.277279	0.280597		
0.6	25.00473	0.319748	0.47116		
0.7	21.09845	0.443608	0.57097		
0.8	18.16139	0.497998	0.937182		
0.9	16.87171	0.558165	1.172947		0.9
1.0	16.32066	0.617798	1.348008		
1.1	16.72484	0.632979	1.416017		
1.2	17.29583	0.655153	1.407716		
1.3	17.32904	0.637919	1.675559		
1.4	17.70454	0.684051	1.679762		
1.5	17.62023	0.673556	1.756362		
0.5	90.41364	-3.29933	77.61044		
0.6	89.85079	-2.44568	87.72712		
0.7	89.74363	-1.13501	93.74347		
0.8	89.35147	-0.21853	96.08187		
0.9	88.89533	0.51147	102.8041		
1.0	88.62597	1.298075	103.5699		1.0
1.1	88.38822	1.695046	103.2291		
1.2	88.18096	2.195836	102.9618		
1.3	87.97902	2.525616	102.6705		
1.4	87.80142	2.905146	102.3824		
1.5	87.73364	2.88664	102.4145		
0.5	58.53578	58.04252	5.982919	58.35006	
0.6	54.34987	64.63001	9.540382	65.33036	
0.7	51.79569	68.4088	13.20253	69.67116	
0.8	49.86831	70.19754	15.86467	71.96793	
0.9	48.34476	70.8736	18.6981	73.29861	
1.0	47.17831	70.84154	21.17923	73.93973	1.0
1.1	46.41075	70.17806	22.74449	73.77176	
1.2	45.83129	69.48778	24.3254	73.62252	
1.3	45.19931	68.64185	25.34848	73.17273	
1.4	44.79555	67.72832	26.05151	72.56587	
1.5	44.7473	67.82128	26.30518	72.74399	
0.5	55.61472	-15.1513	-40.8428	43.56256	
0.6	49.5339	-15.6457	-46.3402	48.91019	
0.7	46.44015	-13.7795	-47.594	49.54862	
0.8	42.44266	-13.5934	-50.8079	52.59491	
0.9	39.0606	-12.5258	-53.0231	54.48247	
1.0	37.80527	-11.7118	-52.8546	54.13664	0.9
1.1	37.44351	-11.6356	-52.1617	53.44368	
1.2	37.12118	-11.6203	-51.5705	52.86344	
1.3	36.91537	-11.8353	-50.8339	52.19351	
1.4	36.8431	-12.0872	-50.399	51.82816	
1.5	37.07108	-12.3792	-50.2994	51.8003	

Here is a screen grab of a measurement file generated with spotread and opened with Excel (prettied up a bit). I didn’t include the XYZ values. The CHROMA column for magenta and cyan is the square root of the sum of the squares of a and b columns.

I have included a good estimate to use here. Notice as more ink is added the black actually gets lighter, the yellow, magenta and cyan get less intense. Also notice how the colors shift, with a and b, one column goes up while the other goes down.

I have chosen maximum ink density values for use with the default linearity curves within WinGP. They are my best guess-estimate and in reality are quite conservative as we will see with other methods.

These values would then be entered into the four ink density adjustments and the entire setup should be saved by clicking the SAVE SETTING button on the Printer Settings menu.

Have fun playing.