



## **G7 Press Control System Application Data Sheet**

The Idealliance Print Properties Council has established a certification process for G7 Press Control Systems.

In accordance with this process, the G7 Press Control System Certification Program evaluates the ability of a candidate press control system to drive a press towards ideal G7 conditions, with special focus on the system's ability to:

- Calculate the ideal G7 "target values" or "aim-points" for tonality (expressed in L\* or neutral density) and gray balance (expressed in CIE a\* and b\*). These target values are what should be measured on a good print that perfectly complies with the G7 specification.
- Suggest ink quantity adjustment trends (i.e. increased or decreased ink densities) likely to help the press meet those G7 target values

Full details of the G7 Press Control System Certification process are given in the companion document, *G7 Press Control System Certification Process*. At the time of testing, the manufacturer must supply an Application Data Sheet

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Manufacturer

System Brunner AG

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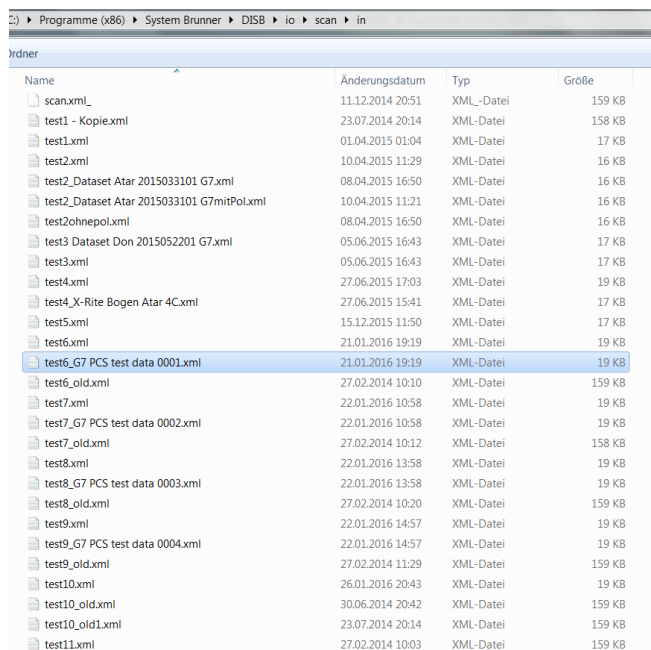
Product

**INSTRUMENT FLIGHT®**

## Test Operation

The test files supplied from Idealliance represent one set of spectral data with 18 color patches for a specific ink key. That means, for the test we are just looking to one ink key and not over all the ink keys of a press.

The Instrument Flight Software is prepared to load 10 different Sets of Test results. The data first has to be implemented in the data structure the Instrument Flight software is able to read as it would be a real measurement from a spectral scan measuring device. This file will get the name e.g. "test6.xml".

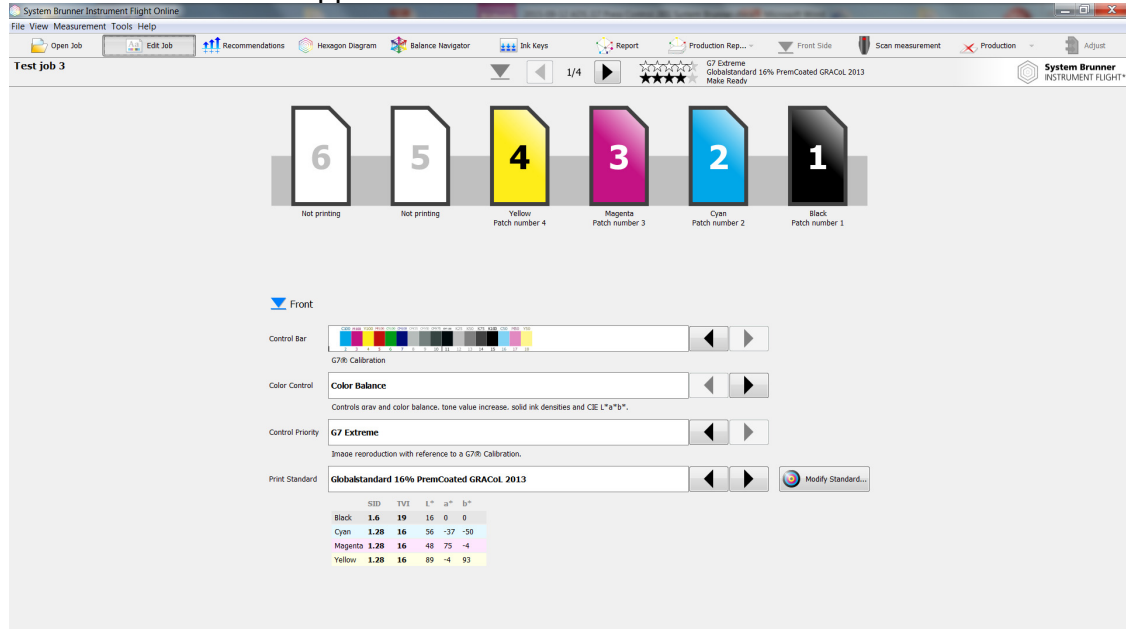


Name	Änderungsdatum	Typ	Größe
scan.xmlL	11.12.2014 20:51	XML-Datei	159 KB
test1 - Kopie.xml	23.07.2014 20:14	XML-Datei	158 KB
test1.xml	01.04.2015 01:04	XML-Datei	17 KB
test2.xml	10.04.2015 11:29	XML-Datei	16 KB
test2_Dataset Atar 2015033101 G7.xml	08.04.2015 16:50	XML-Datei	16 KB
test2_Dataset Atar 2015033101 G7mitPol.xml	10.04.2015 11:21	XML-Datei	16 KB
test2ohnepol.xml	08.04.2015 16:50	XML-Datei	16 KB
test3 Dataset Don 2015052201 G7.xml	05.06.2015 16:43	XML-Datei	17 KB
test3.xml	05.06.2015 16:43	XML-Datei	17 KB
test4.xml	27.06.2015 17:03	XML-Datei	19 KB
test4_X-Rite Bogen Atar 4C.xml	27.06.2015 15:41	XML-Datei	17 KB
test5.xml	15.12.2015 11:50	XML-Datei	17 KB
test6.xml	21.01.2016 19:19	XML-Datei	19 KB
test6_G7 PCS test data 0001.xml	21.01.2016 19:19	XML-Datei	19 KB
test6_old.xml	27.02.2014 10:10	XML-Datei	159 KB
test7.xml	22.01.2016 10:58	XML-Datei	19 KB
test7_G7 PCS test data 0002.xml	22.01.2016 10:58	XML-Datei	19 KB
test7_old.xml	27.02.2014 10:12	XML-Datei	158 KB
test8.xml	22.01.2016 13:58	XML-Datei	19 KB
test8_G7 PCS test data 0003.xml	22.01.2016 13:58	XML-Datei	19 KB
test8_old.xml	27.02.2014 10:20	XML-Datei	159 KB
test9.xml	22.01.2016 14:57	XML-Datei	19 KB
test9_G7 PCS test data 0004.xml	22.01.2016 14:57	XML-Datei	19 KB
test9_old.xml	27.02.2014 11:29	XML-Datei	159 KB
test10.xml	26.01.2016 20:43	XML-Datei	19 KB
test10_old.xml	30.06.2014 20:42	XML-Datei	159 KB
test10_old1.xml	23.07.2014 20:14	XML-Datei	159 KB
test11.xml	27.02.2014 10:03	XML-Datei	159 KB

Launch the Instrument Flight Software application with double-click on the Hexagon Icon in the Toolbar.



## The Edit Job Screen appears



### Color Bar:

Set the color bar with the 18 patches for the G7 Test

### Color Control:

Set color control strategy to “Color Balance” (IF allows two different control strategies: Individual Solid Density or Solid Lab control, Color/Gray Balance control)

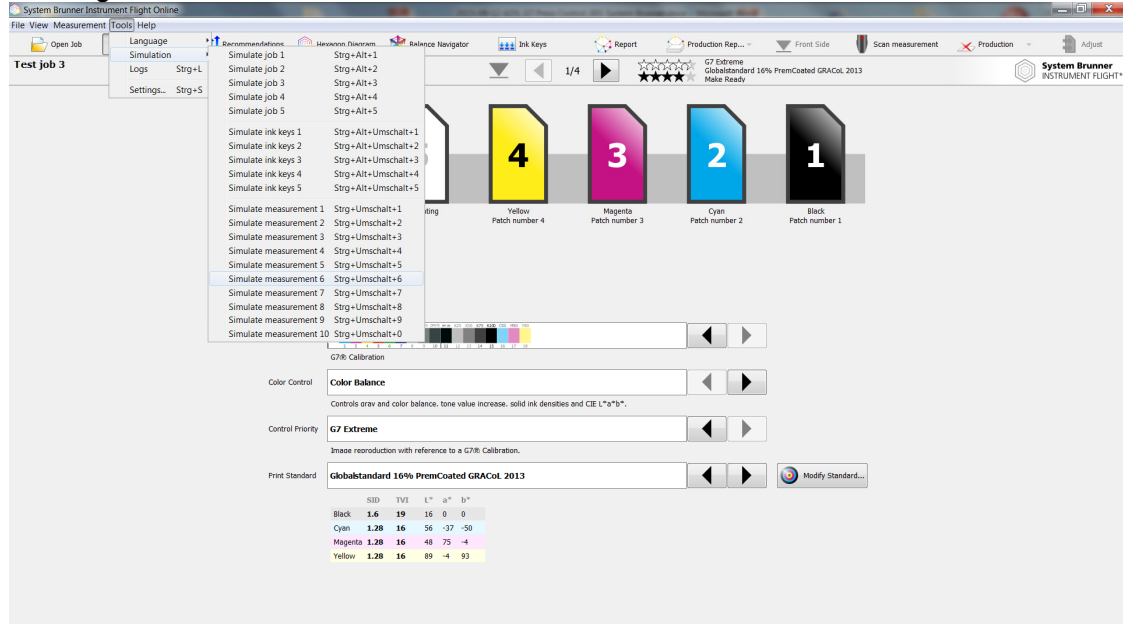
### Control Priority:

Set the control Priority to “G7 Extreme” for the certification test (5 different Priorities may be selected)

### Print Standard:

Select a certain Print Condition, e.g. with the name “Globalstandard 16% PremCoated GRACol 2013”.

**Loading test measurement files into the software:**

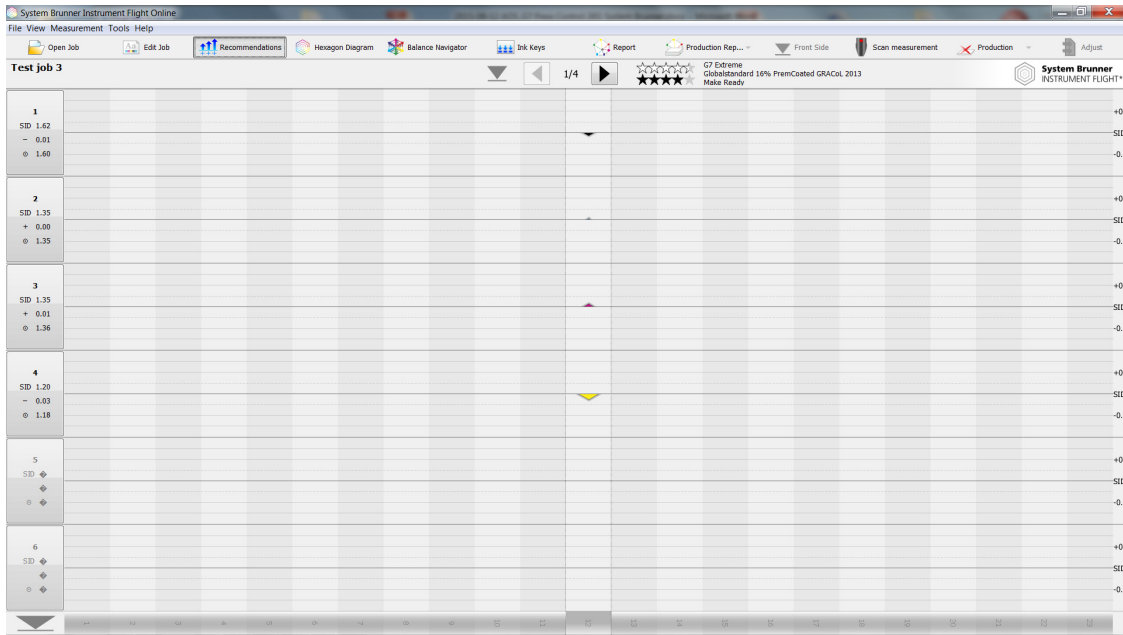


**Select:** Tools / Simulation / Simulate measurement.

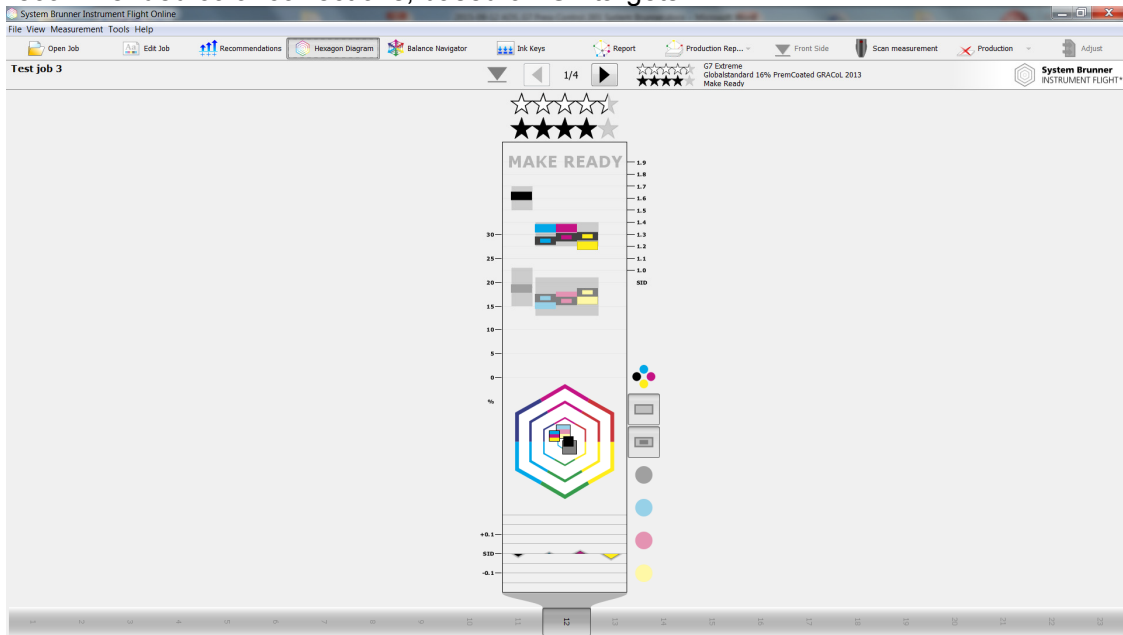
The user will get a separate guide to understand, which measurement data belongs to measurement 1, 2, 3....

As soon as the box is selected, the measurement is loaded into the application.

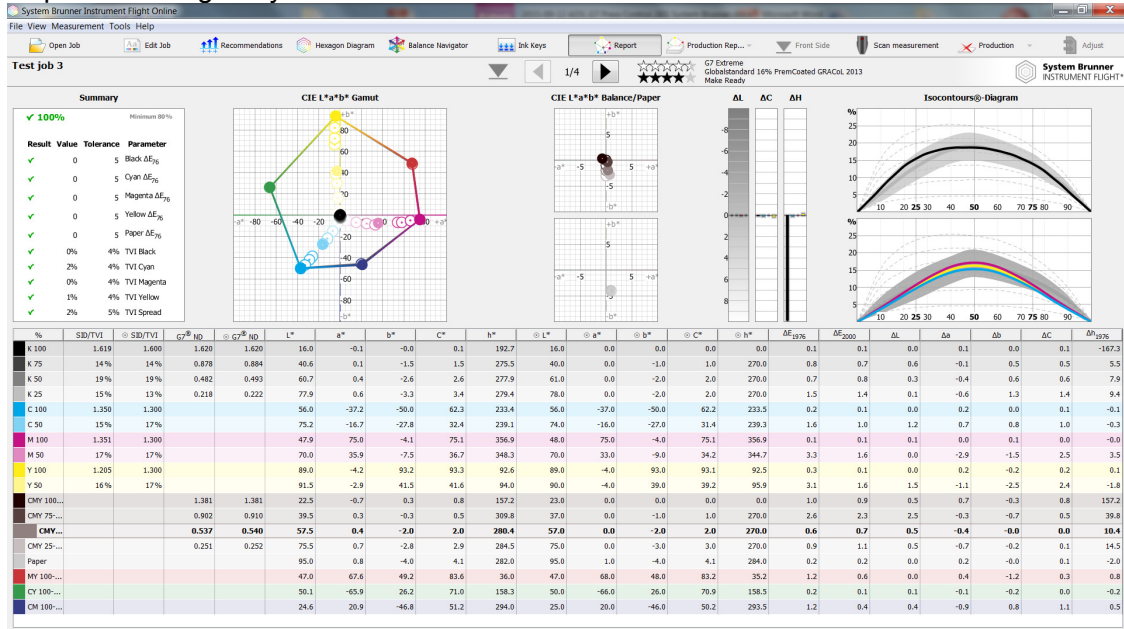
Select the "Recommendations" Tab to display color control recommendations which lead to improved CMY-Gray Balance and tonality according to G7:



Select "Hexagon Diagram" to display Process Diagnostics with Gray Balance, TVI, SID and recommended color corrections, based on G7 targets.



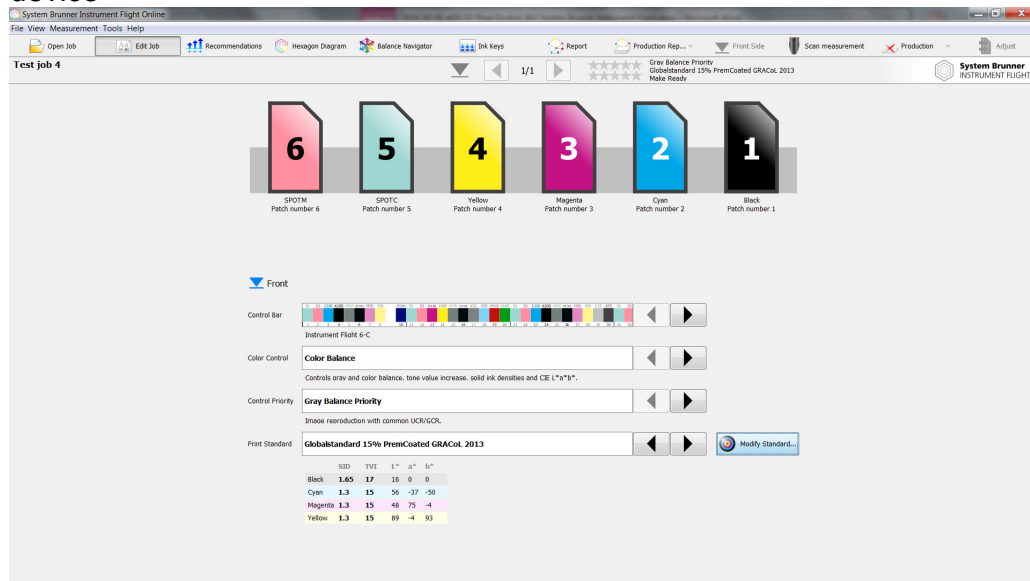
Report including Gray Balance and ND values



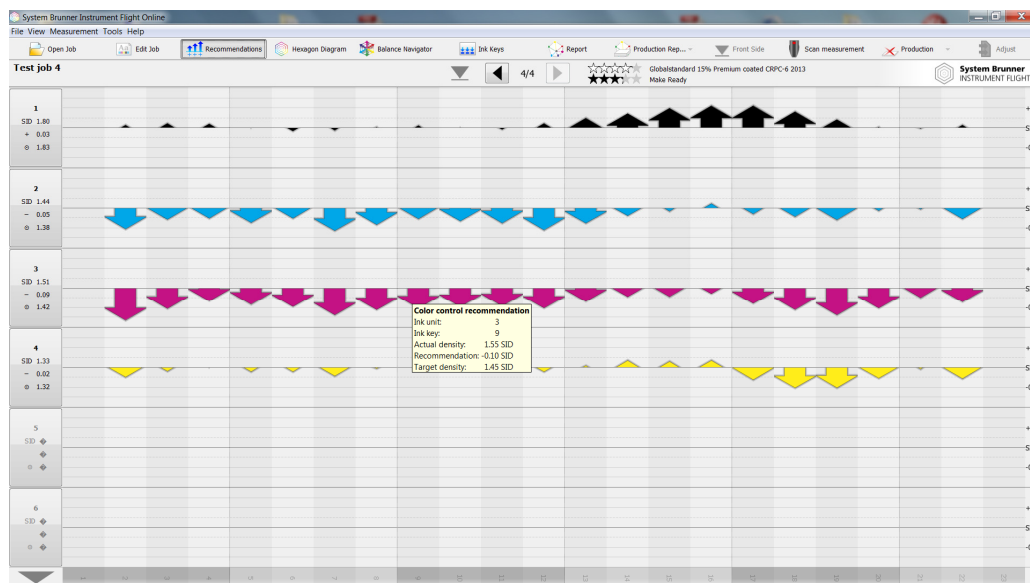
%	SID/TVI	⊙ SID/TVI	G7® ND	⊙ G7® ND	L*	a*	b*
K 100	1.619	1.600	1.620	1.620	16.0	-0.1	-0.0
K 75	14%	14%	0.878	0.884	40.6	0.1	-1.5
K 50	19%	19%	0.482	0.493	60.7	0.4	-2.6
K 25	35%	35%	0.218	0.222	77.9	0.6	-3.3
C 100	1.350	1.300			56.0	-37.2	-50.0
C 50	15%	17%			75.2	-16.7	-27.8
M 100	1.351	1.300			47.9	75.0	-4.1
M 50	17%	17%			70.0	35.9	-7.5
Y 100	1.205	1.300			89.0	-4.2	93.2
Y 50	16%	17%			91.5	-2.9	41.5
CMY 100...			1.381	1.381	22.5	-0.7	0.3
CMY 75...			0.902	0.910	39.5	0.3	-0.3
CMY...			0.537	0.540	57.5	0.4	-2.0
CMY 25...			0.251	0.252	75.5	0.7	-2.8
Paper					95.0	0.8	-4.0
MY 100...			47.0	67.6	49.2	83.6	36.0
CY 100...			50.1	-65.9	26.2	71.0	158.3
CM 100...			24.6	20.9	-46.8	51.2	294.0

Operating instructions:

In real production, the operator just opens the job from the menu “Open Job”. The CIP-3 or JDF information is loaded in the software, the ink key Preset is done. The operator selects e.g. the G7 color control priority. Then the first sheets are printed and measured with the Scanning Spectral device

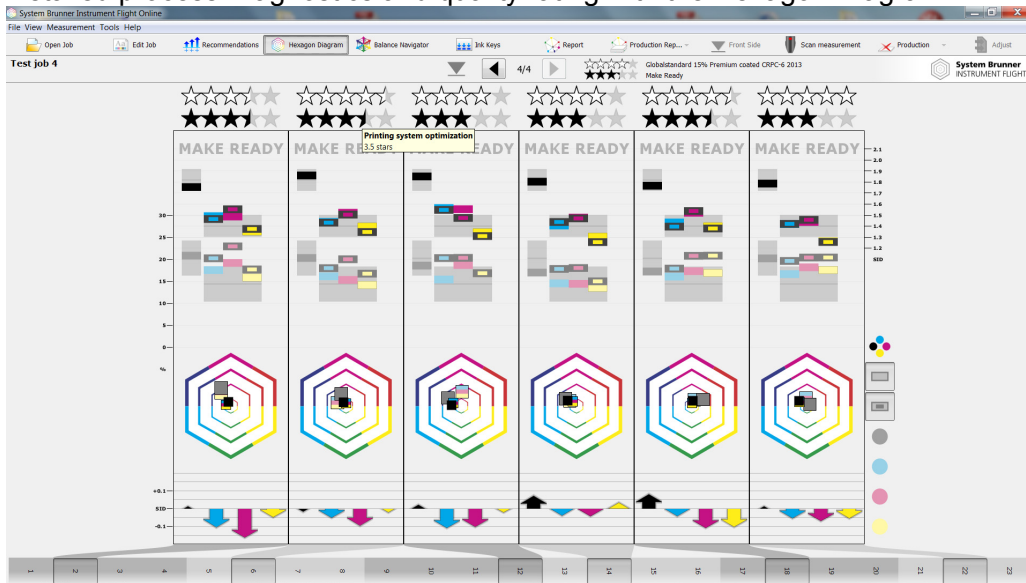


The spectral data of each patch is sent to the Instrument Flight Software and the recommended ink key moves are displayed. The operator takes the decision to correct the ink keys automatically by pressing the button “Adjust” on the right upper side.



The operator will print the next series of sheets until the color corrections are done, measure again a sheet, observe the results and repeats the corrections again, if there are still major ink key adjustments visible. If not, he may check how good the match with the target Standard is. Tab “Hexagon Diagram”

Detailed process Diagnostics and quality rating with the Hexagon Diagram





Instrument Flight Control Bar, optimal compliance for G7

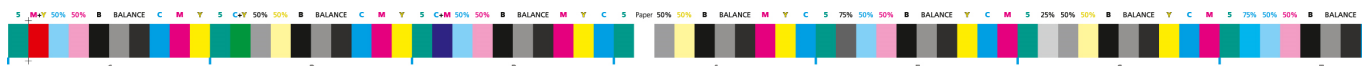


6-C Instrument Flight control bar

This color bar includes in each ink key a CMY Gray Balance mid tone and solid tone patch (50/40/40% and 3x100%). Also the special color patches 5/6 are in each ink key available. Always within 2 ink keys there are the individual C/M/Y/K 100% and 50% halftone patches. Further patches are: CMY Gray Balance Patch 75/66/66, 25/19/19, 10/06/06. Additional halftone patches in CMYK: 10/25/75/90%. R/G/B 100% patches (2-C Overprint).



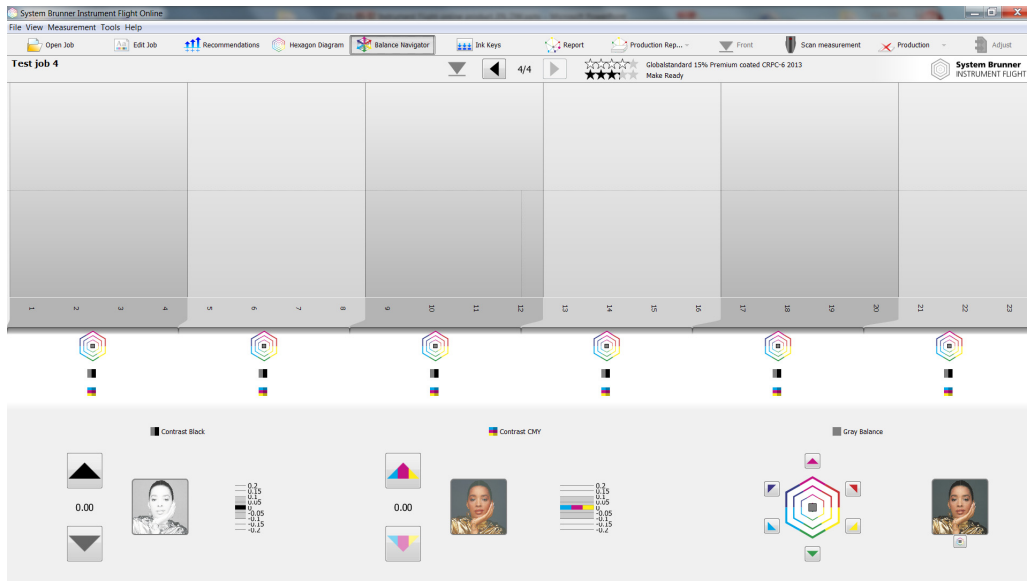
4-C Instrument Flight control bar



5-C Instrument Flight control bar

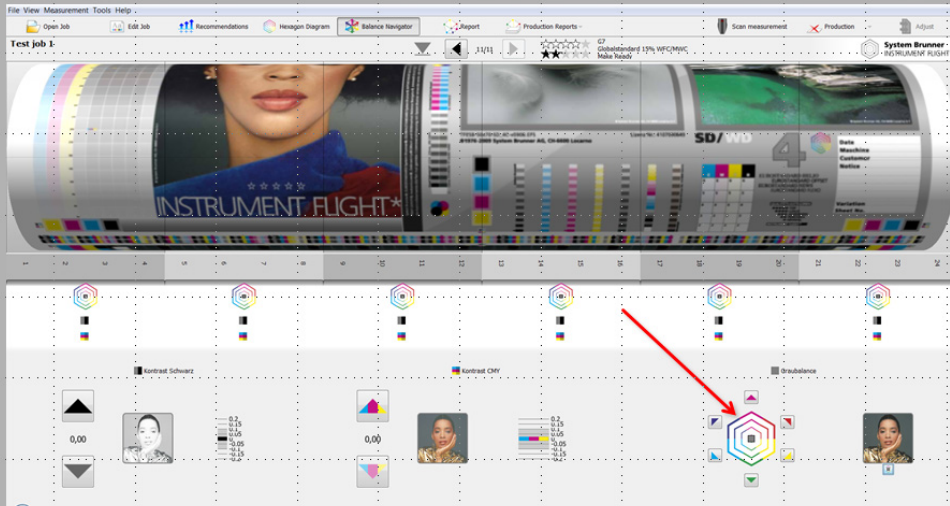
## Balance Navigator®

This exclusive functionality allows the operator to make color/gray balance shifts or tonality changes automatically in closed loop. The software takes the decision, which color should be increased/decreased to achieve the target shift. CMY and Black corrections are independent. See samples below.



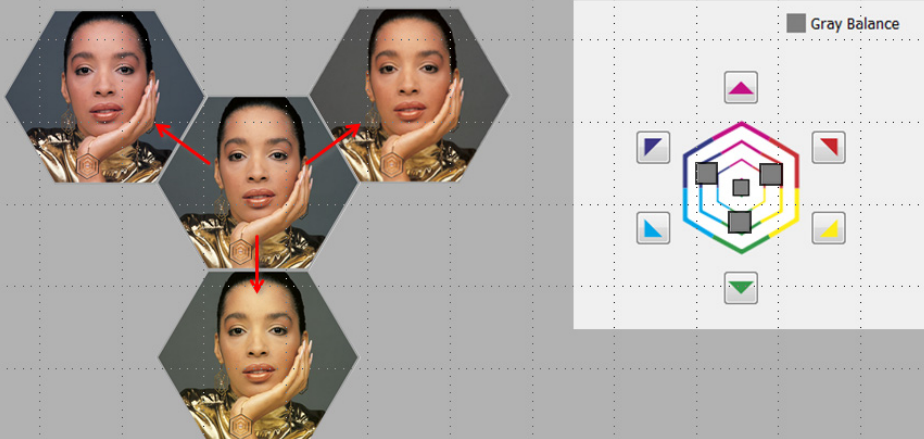
**Instrument Flight® with Balance Navigator®**

Easy Color Balance/Tonality changes, in closed loop



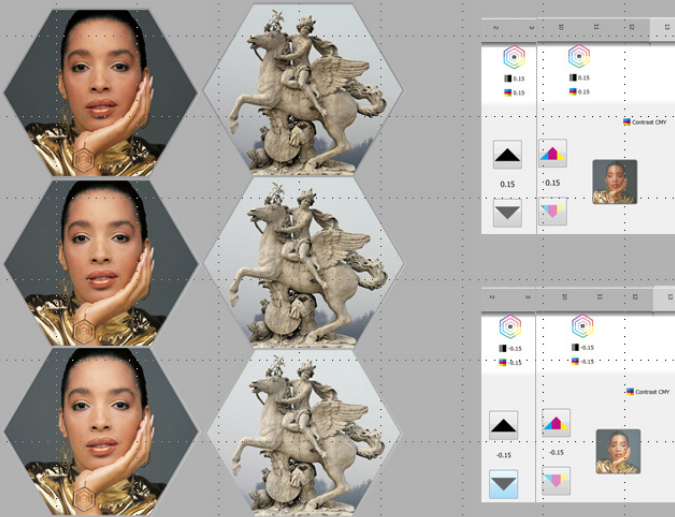
**Instrument Flight® with Balance Navigator®**

Easy Color Balance changes, in closed loop




**Instrument Flight® with Balance Navigator®**

**Easy Contrast / Tonality changes in closed loop, maintaining Gray balance**



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### **Production control according to reference Print condition (e.g. CRPC or Globalstandard System Brunner)**

If a user would like to run his production according to the target CRPC reference Print condition, including the gray balance and tonality according to G7, then he may select in the job edit section:

**Color Control:**

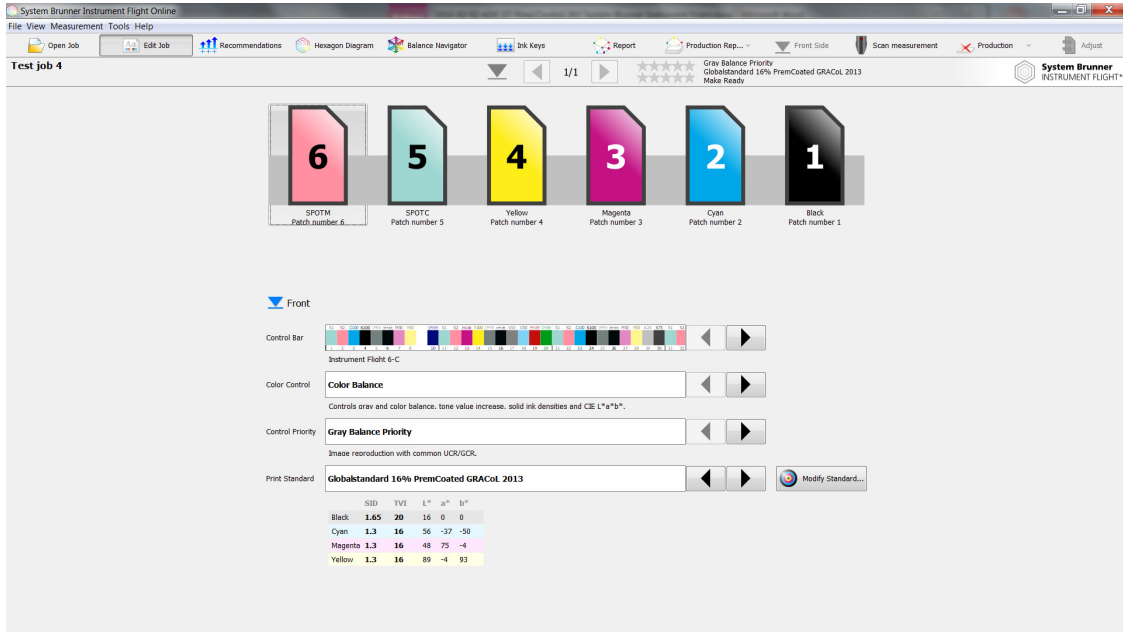
Set to “Color Balance” (IF allows 2 different control strategies: Color/Gray Balance control or individual SID’s and Solid LAB control,)

**Control Priority:**

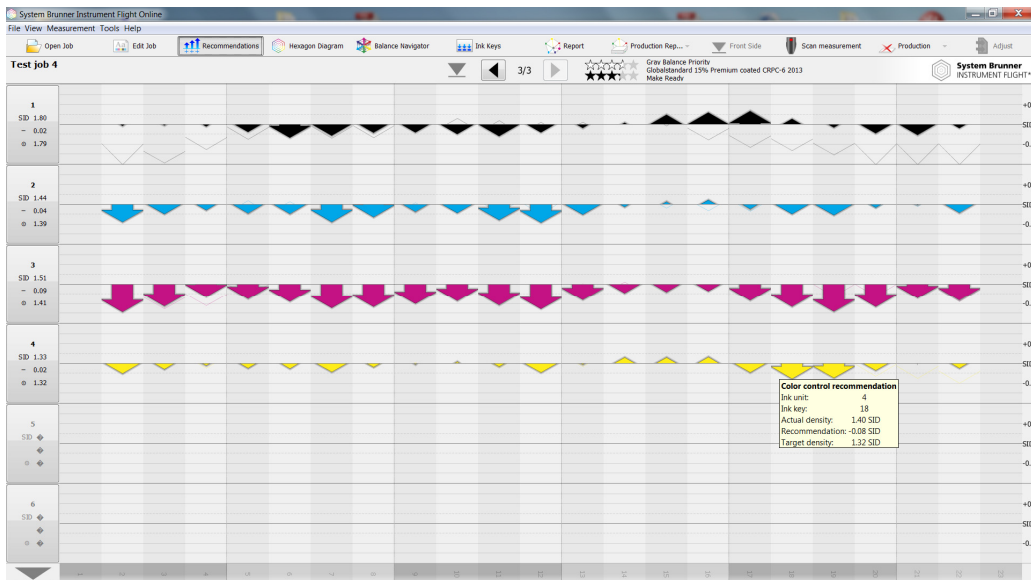
Select “Gray Balance Priority” (5 different Balance related control priorities can be selected)

**Print Standard:**

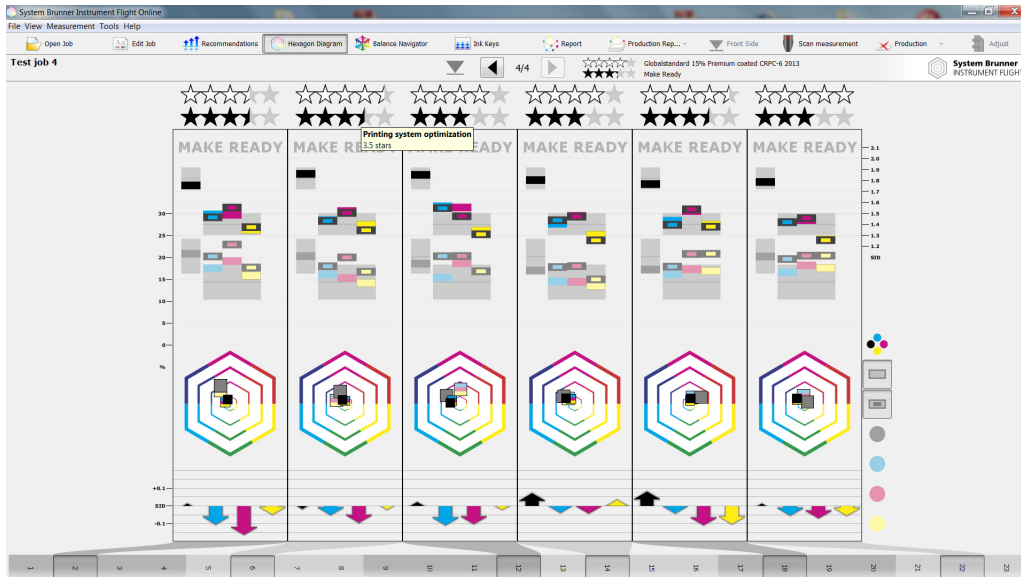
Select the target Print Conditions, e.g. Globalstandard 16% Premium coated CRPC-6 2013) ”.



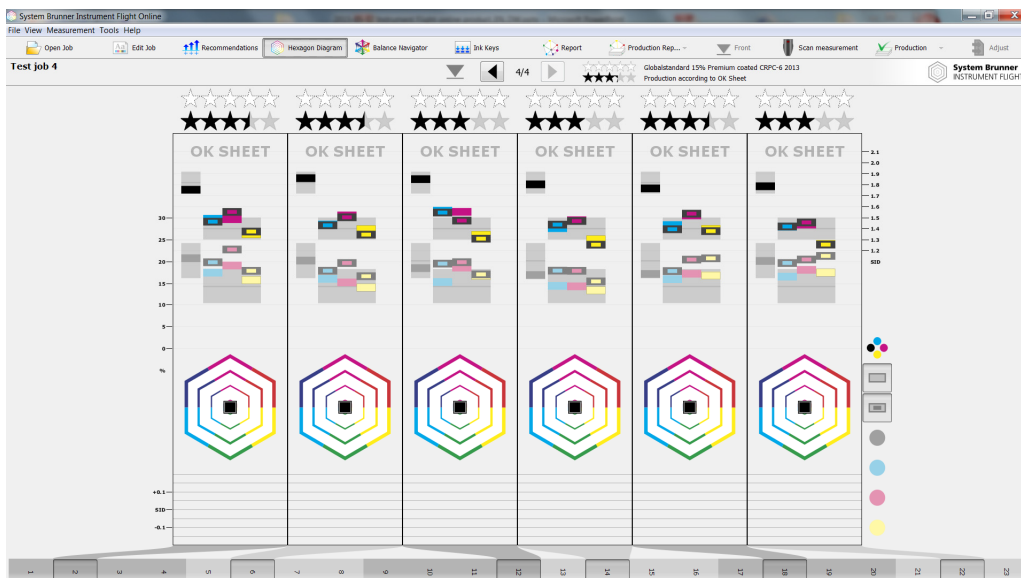
In this case, the software calculates the color corrections including Gray Balance, Tonality, TVI, Overprints, Solid Densities and L\*a\*b\* density optimization (Best Match)



Recommended Gray Balance/Tonality prioritized ink adjustments per Ink Key



Hexagon-Graphic: Process diagnostic and 5-Star quality rating in relation to the defined Standard.



If an OK-Sheet is defined, the actual printing result including all printing attributes are defined as the new target and the color correction of the next measurements are judged to this sheet.

The Hexagon Diagrams show the Color Balance in the center of the Hexagon, no more ink adjustments are visible from the ok-Sheet.

## Appendix A: G7 Gray Balance

G7 Gray Balance formulae used in validating system are given in the document “TR015”, available free at [www.idealliance.org](http://www.idealliance.org).

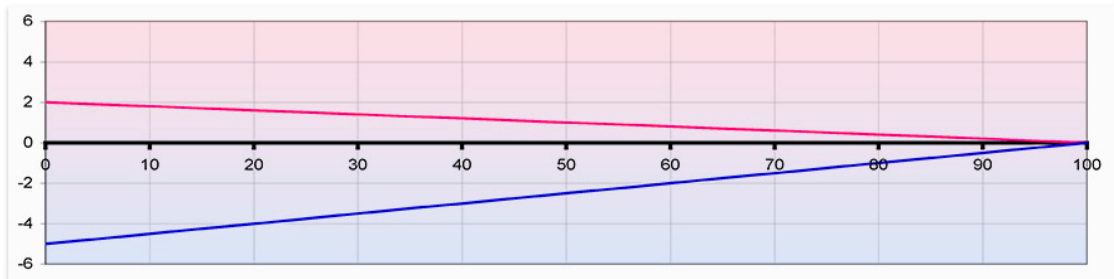
Note that TR015 contains two versions of gray balance formula. The formulae used for the G7 Press Control System Certification program are as follows:

G7 defines gray balance as a function of substrate color ( $a^*$ ,  $b^*$ ) and Cyan percentage (C%) where the “wanted”  $a^*$  and  $b^*$  values for each gray scale step reduce towards zero in inverse proportion to C% according to the formulae;

$$a^*_{\text{wanted}} = a^*_{\text{substrate}} \times (100 - C\%) / 100;$$

$$b^*_{\text{wanted}} = b^*_{\text{substrate}} \times (100 - C\%) / 100;$$

Ideal G7 gray balance can be expressed graphically as two straight lines, one for  $a^*_{\text{wanted}}$  (shown in pink in the graph below) and one for  $b^*_{\text{wanted}}$  (blue), where both lines begin at the substrate  $a^*$  and  $b^*$  values when  $C=0$ , and terminate at zero  $a^*$  and  $b^*$  when  $C=100$ .



*G7 gray balance graphs of  $a^*$  (pink) and  $b^*$  (blue) on substrate of  $a^* = 2$ ,  $b^* = -5$*



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Color Control Technology

Appendix B: G7 NPDC (tonality) formulae  
G7 NPDC formulae used in validating system are given in the document  
“TR015”, available separately at [www.idealliance.org](http://www.idealliance.org).