

On-Web Closed Loop Color Control

# ColorQuick

Automatic spectrophotometer measurement of high speed web and control of ink keys.



Make Your Press an Automated, Predictable, Calibrated, Output Device in a Color Managed Digital Workflow

"PRINT TO THE NUMBERS"



Folding carton



Labels



Packaging



Commercial



Newspaper



**GMI**  
an AVT company



# ColorQuick

## On-Web Closed Loop Color Control

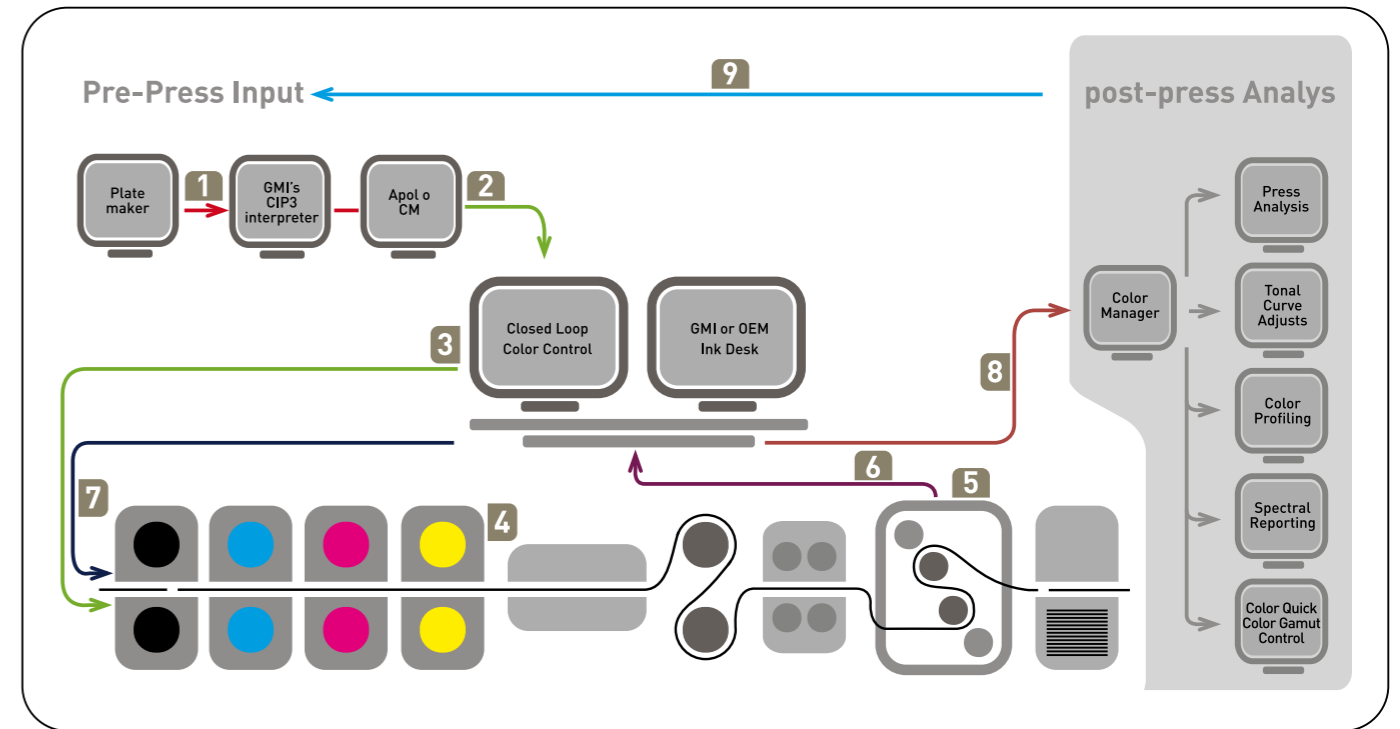
ColorQuick, an on-web closed loop color control system, is a critical press auxiliary to make your web printing the most cost effective and the highest quality. ColorQuick scans the printed web in real time and automatically controls the ink densities to ANSI-ISO Status T or E target values. A specially designed 2mm color bar is measured with an ANSI-ISO standard Spectrophotometer while the press is running. This industry-standard color measurement tool generates three critical pieces of color information for each color at each ink key position: Status T or E density value, Colorimetric L\*a\*b\* or L\*C\*h values plus Delta E ( $\Delta E$ ) value, and the actual Spectral Curve of the measured patch. These three color measurement approaches provide important information to reduce make-ready waste, improve color print consistency and matching, and to maintain a consistent visual appearance throughout the print run. Precise color printing requires precise color measurement, and ColorQuick is the ONLY closed loop color control system that uses a dual beam spectrophotometer built to ANSI ISO specifications. This dual beam spectrophotometer measures the reflectance value of each color at every 10 nanometers across the visible spectrum,

31 points of information to define the color. The ColorQuick spectrophotometer eliminates the need for a "correction algorithm for ambient light", or "look up tables" for L\*a\*b\* data, or "special calibration for Status T" as are needed by camera solutions.

Key information is also generated concerning the paper and inks used for the print job. Density data is used to automatically control the press ink keys to quickly drive the press to Target Density values (e.g. SWOP or your own shop standards). Colorimetric data can be used to verify that special colors or process builds are to the print buyer's specification (e.g. "Marlboro Red"). Spectral Curve information can be used to verify ink and paper specifications throughout the print run, as well as, be used to provide consistent visual appearance by monitoring and maintaining three-color neutral grey patches.

To meet the increasing demands of today's print buyers, and to stay most cost effective in today's highly competitive print markets, all three pieces of color measurement information need to be effectively used. GMI supplies the system and the training to make this a reality in your pressroom.

## Color Managed Workflow with ColorQuick Closed Loop Color Control



The automatic control of ink keys on a high speed web press requires the very best in color measurement and control algorithms or the waste can be significant. The ColorQuick ANSI-ISO standard Spectrophotometer is THE MOST ACCURATE color measurement tool available (e.g. All handheld color measurement suppliers use Spectrophotometers). GMI has supplied over 1000 of closed loop color control systems since

1991, first on sheet-fed presses, and now on web presses. Accuracy and Experience are critical keys to effective automation. High speed printing is a complex process. ColorQuick not only automates the vital color control part of the process, but the Color Manager station that comes with the system also provides a comprehensive package of SPC reports for addressing customer issues and for improving the print process



- 1 Customer artwork is captured from the plate maker for presetting the press.
- 2 The GMI CIP3 Interpreter converts a low-resolution image of the captured artwork into digital ink key presets.
- 3 The presets are converted into ink key positions and sent to the press units.
- 4 The press prints the artwork onto the paper.
- 5 Spectrophotometers mounted on the press collect colorimetric data during the live production run.
- 6 Sample measurement data is sent to the ColorQuick system
- 7 ColorQuick uses the measurement data to determine the best ink key positions for optimal ink coverage and automatically sends instructions to the ink desk to adjust the ink keys to match desired color output.
- 8 The collected run data is sent to servers where it can be output in a variety of SPC and run control reports and charts.
- 9 Analyses of the run data are used to correct color output and streamline production.

### Features of the Spectrophotometer

- Most accurate tool for measurement of process & special colors, process builds
- Produces Status T & E density data
- Can provide L\*a\*b\*, L\*C\*h &  $\Delta E$  values
- Can supply color information for defining the ICC Color Profile of the press
- Can monitor and produce spectral curves to maintain neutral grey patches
- Recognizes color shifts that have the same nominal ink film density

### Benefits to the Printer

- Faster make-readies, reach expected color faster with tighter control tolerances
- Same values as pre-press, results in faster make-readies, dot gain data usable by CTP system
- Lower costs by identifying non-compliant ink & paper
- Faster make-readies, know the printable color gamut of the press
- Reduced run waste with improved automatic control of the visual image as compared to the color OK
- Better color control, no errors introduced by measuring the wrong color patch

# Value-Added Modules

## Standard Color Manager

When the job is complete, color measurement information is available for further statistical analysis on the Color Manager. Full analysis of all the color element measurements is available through a suite of displays and reports, including standard Statistical Process Control (SPC) charts in X-bar and R chart format.

Color Manager displays job summary data as a trend line and histograms, for dot gain, delta density, print contrast, and trap. Your in-house quality staff and your customers can use this color information for accurate analysis and ISO 9000 documentation. In addition, color measurement information may be exported in formats compatible with dBase or Microsoft Access databases.

## Optional Tone Value Analysis



ColorQuick Spectral Reports are the link to prepress and digital color management systems. Because ColorQuick is a spectrophotometer, it can offer three types of measurement needed in today's pressroom: Densitometry, Colorimetry, and Spectrophotometry – in real time. All reports and charts can be displayed using  $L^*a^*b$  or  $L^*C^*h_{(ab)}$  color spaces; and you can use  $E^*_{ab}$ ,  $E^*_{cmc}$  or  $E^*_{94}$  color difference equations. Results can be quickly exported to prepress for fast, accurate plate corrections based on the G7® methods.

## Optional Color Gamut Control



Color Gamut Control takes closed loop color control to the next level – by measuring and controlling ink key setting based on measurements of a three-color halftone neutral patch on each ink key. Because the human visual system is extremely sensitive to changes in neutrals with respect to hue, changes in the gray patch can be detected, and corrected, before they have a negative impact on the appearance of the colors within the live work. Color Gamut Control's automated, colorimetric control of neutrals provides closed-loop support for the G7® methodology. ColorQuick's unique, colorimetric adjustments of gray balance can deliver unsurpassed visual consistency throughout a high-speed web press run.

## Optional Press Analysis

Press Analysis creates charts and reports that can be used to compare performance levels for one press over time, or several presses in multiple pressroom locations. These charts and reports allow you to create a profile for your press and compare each press's performance to others in your operation. Having statistically analyzed presses in your pressroom will enable you to shift critical quality work to the press, or presses that performed the best, and to target which press should be scheduled for maintenance, replacement, or overhaul.

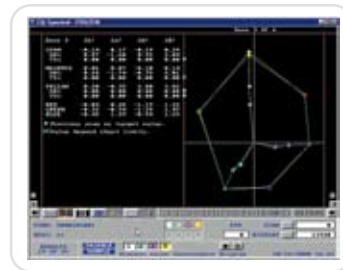
Note: Tone Value Analysis and Color Gamut Control, GMI's G7® support tools, require the purchase of additional, optional software modules.



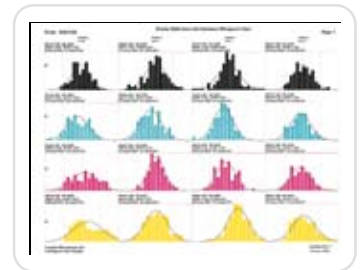
Density Trend Chart



Process Color Gamut Summary



Color Gamut Detail



Histogram of Density Differences from Standard



Together we make the *difference*

[www.avt-inc.com](http://www.avt-inc.com)



AVT & GMI are the leading providers of Automatic Inspection, Color Control and Press Automation solutions for the printing industry. Thousands of AVT & GMI solutions are installed at leading packaging, labels, folding cartons, commercial & newspaper printing companies. AVT headquarters are located in Israel, with R&D and manufacturing facilities in Israel and the United States. The companies have a worldwide network of marketing, sales and customer care centers. AVT is a public company listed in the Prime Standard of the Frankfurt Stock Exchange.

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