



## On-line Colour Control

**Maintains colour of paper at target specifications in the presence of process disturbances and helps perform faster and smoother colour grade changes**

The colour control strategy consists of supervisory feedback control algorithms designed to maintain dye flow ratios (weight of dye/ton of stock) at specified setpoints, and primary flow controllers which maintain dye flows to achieve the desired colour, shade of white and brightness. The supervisory software is configured in iFIX Dynamics™ and installed in the colour system host computer. The program uses the transport model of the papermachine and takes into account the nonlinear relationship between dye concentration and the resulting colour of the paper. The supervisory system provides ratio setpoint adjustment to the primary dye flow controllers based on the colour coordinates from the measurement system. Dye flow setpoints are sent to the metering pumps via a programmable logic controller (PLC) or distributed control system (DCS). Colour targets and process data for each paper grade are stored in the recipe management module. The system supports up to three dyes, simultaneously injected into the machine.

The system software provides the flexibility to implement automatic control as per the existing manual strategy used by operators and improve from there. The control approach for each application is discussed with mill personnel and tailored to the specific process.

Colour control can be implemented in two stages. The first stage being an “advisory” system, whereby the colour computer calculates dye flow ratio setpoints and recommends values to the operator. Operators in turn, use the recommended values to manually adjust the metering pump controllers. The second stage is the natural progression of the advisory mode, where the papermachine control loop is closed and the computer automatically drives the pumps through the PLC or DCS system controllers.