PDC Series Specifications

Model	PDC-SX	PDC-SG
Sensor head	Spectrophotometer	
Density control functions	Density, dot gain, trapping, contrast, hue error, grayness, etc.	
Color control functions	L*a*b*, $\triangle$ E, etc.	
Compatible models	26"–44"	26"–44"*1 ENTHRONE
Number of colors	Up to 11 colors (up to 8 colors for perfectors and SP machines)	Up to 6 colors (single-sided presses other than Enthrone)
Positioning on color bar	Automatic	Manual
Patch size (minimum)	3.0 mm (H) x 3.0 mm (W)	3.5 mm (H) x 4.0 mm (W) 5 mm (height) recommended
Color bar position	Anywhere on sheet (However, not within 10 mm of gripper edge)	The color bar should fit within 40 mm of sheet edge *3
Spot measurement	Automatic measurement of registered locations	Manual (removable measurement head type)
Automatic registration	Between colors and front/back printing position	-
Defect history	ISO 12647-2[PSO], GRACol, Japan Color	
Measurement conditions*2	M0, M1, M2, M3 (switchable)	

*1 Not compatible with the Lithrone GX series, perfectors, and SP machines.
*2 M3 is a polarizing filter.
*3 There should be a margin between the sheet edge and the color bar. Please contact us for further details.
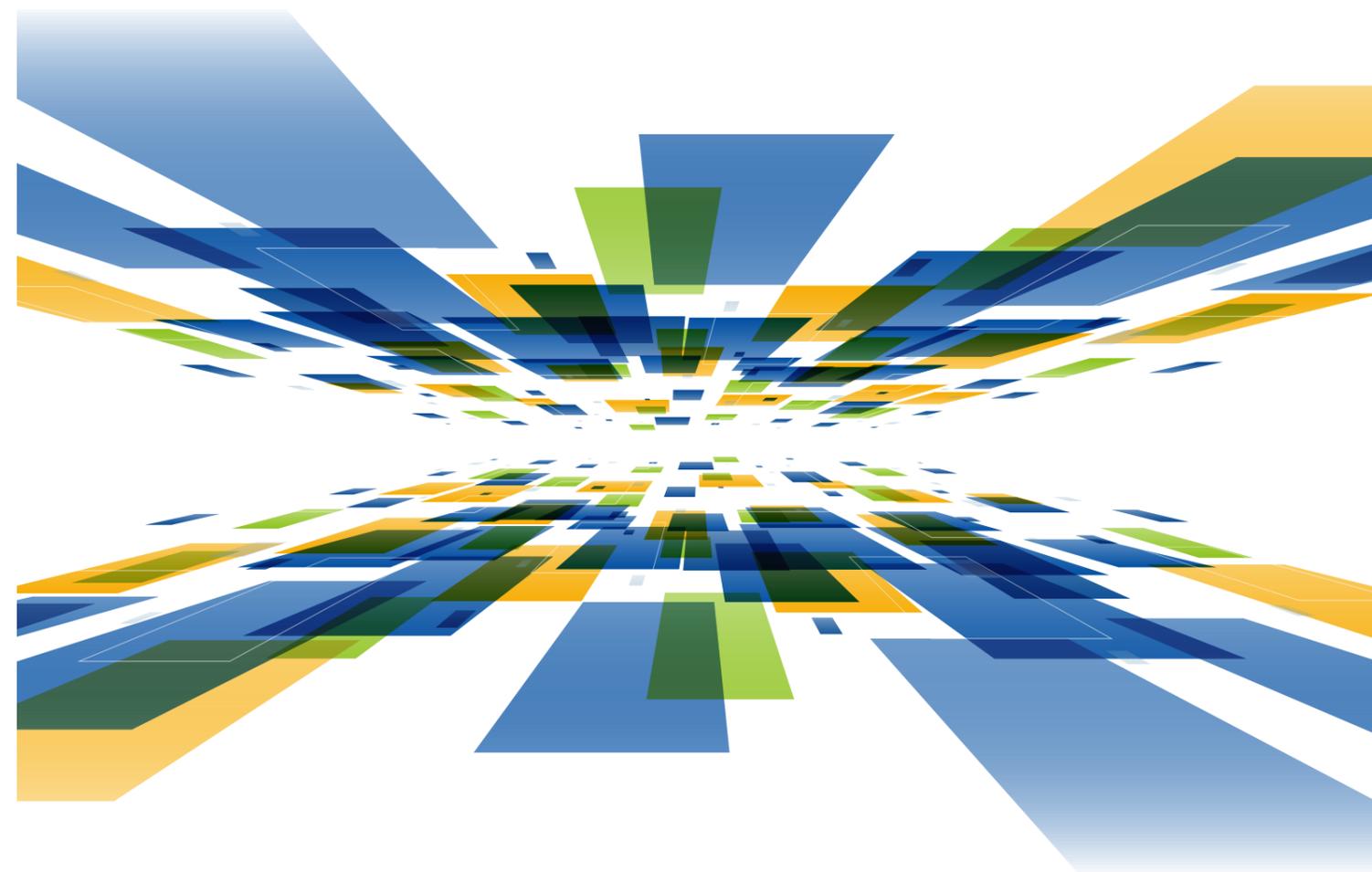
PQA Series Specifications

Model	PQA-S V5	PQA-W V5
Camera	4,096 pixels	2,048 pixels
Resolution*1	0.25 mm/pixel	0.5 mm/pixel
Light source	High intensity white LED	
Max. inspection speed	Maximum printing speed	
Target defects	Ink splashes, scumming, water splashes, oil splashes, hickeys and color variations etc.	Ink splashes, scumming, water splashes, oil splashes, hickeys, color variations, etc.
Target substrates	Plain paper	
Defect history	Monthly defect history data (monthly for a year) 1,000 jobs/month, 1,000 records/job	Monthly defect history data (monthly for a year) 1,000 jobs/month, 1,000 records/job
Color control*2	Optional	-
Automatic registration*2	Optional	-

*1 Actual value depends on press model.
*2 Must be selected when ordering.

KOMORI
Print Management Solutions

Integrated Print Quality Control Systems to Improve Productivity for Printing Companies

Note:
Komori reserves the right to change specifications on machines without notice to improve reliability, functions or design. Komori is under no obligation arising from use that does not correspond to the standard safety measures for the product noted herein and other precautions. The technical information in this catalog constitutes an explanation of the representative operations of the product and grants no rights or license belonging to Komori Corporation or third parties.
The photographs in this catalog include some special specifications. Figures in specifications are valid as of February 2023. Photographs are subject to change at a later date.

The content of this catalog is subject to change without notice.

| PMS | en | JPN | 16P | M21 | 3 | Feb.2023 | - | - |

KOMORI

Improve Profitability by   Tackling These Issues

If you want to increase sales, cut costs, and improve quality, you need to take a closer look at your printing environment.

For example, the challenges below can be easily resolved by making small changes.

Increase **sales** by increasing
number of print jobs

Cut **costs** associated with printing
and increase **profits**

Reduce the amount of **paper waste**
per job as much as possible

Reducing press **set up time makes**
work more efficient

Concerns about **the environment**
like **saving energy and harmful substances**

Routinely produce
high quality printed materials

Not enough **experienced operators**
due to **workforce shortages**

Current printing workflow

Many tasks are required for job changeover.

Changeover

JOB 1

Changeover

JOB 2

Changeover

JOB 3

JOB 4

Maximizing Press Work   Minimizes Operator Work.

Print Management Solutions (PMS) is our solution that optimizes the printing environment to greatly improve quality. Implementing this solution improves productivity, cuts costs, solves workforce shortages, and other issues facing printing companies.

Productivity

Job changeover is performed in parallel by the press, dramatically reducing changeover time.

Number of jobs per day

UP

Costs

Paper waste is reduced to an absolute minimum because color control is automatically performed at print start-up!

Paper waste rate

DOWN

Workforce

Less experienced operators can efficiently operate the press by automating register adjustment and color control!

Effectiveness

UP

Quality

Exceptional quality is consistently maintained due to register, color adjustment and quality inspections!
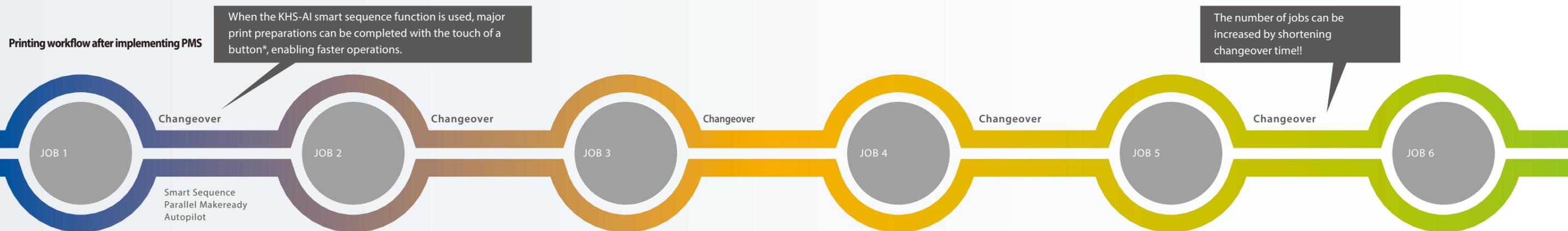
Customer trust

UP

Environment

Reduction of wasted resources through automation greatly reduces CO_2 emissions which also reduces the environmental impact.

Contribution to environment

UP

Printing workflow after implementing PMS

When the KHS-AI smart sequence function is used, major print preparations can be completed with the touch of a button*, enabling faster operations.

The number of jobs can be increased by shortening changeover time!!

| JOB 1 | Changeover | JOB 2 | Changeover | JOB 3 | Changeover | JOB 4 | Changeover | JOB 5 | Changeover | JOB 6 |

Smart Sequence
Parallel Makeready
Autopilot

*May differ in accordance with the conditions

Achieving a Smart Factory

What should printing companies do to facilitate future improvement?

We believe companies need to maximize labor productivity

by promoting use of IoT (the Internet of Things), developing labor and work saving designs,

and strengthening standardization and inspection mechanisms.

In response, Komori developed the concept of Connected Automation,

which helps achieve these goals by improving customer productivity through machines

with labor and work saving technology and connection of manufacturing workflows.

The range of products developed by Komori offer high productivity and value while generating

mutually linked synergies based on these concepts.

KOMORI
KP-Connect

CONNECTED AUTOMATION

Connected Automation is an approach to maximizing customer productivity,

using KP-Connect Pro to centrally connect production systems and machines equipped

with labor and work saving technology.

We provide unique, open environments for joint development

with a variety of manufacturers and vendors around the world.

Product concepts geared toward greater automation

Autopilot

A concept focused on creating systems that use automation technology to assist in tasks
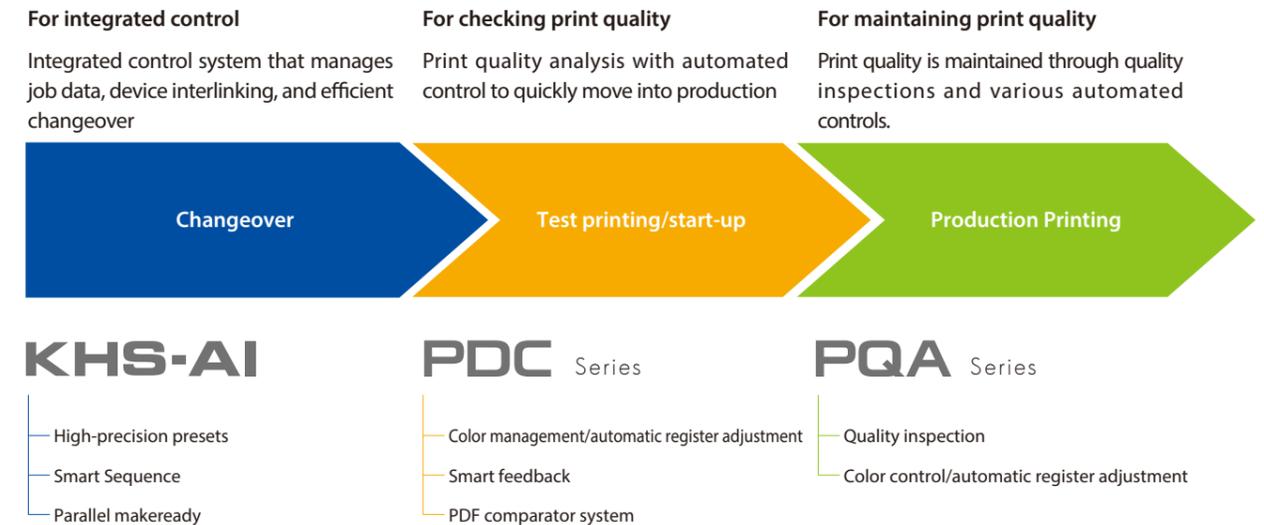for which human judgment is still required.

Parallel Makeready

A concept focused on creating systems that carry out print preparation tasks simultaneously,
minimizing time used by machines.

Print Management Solutions

Komori Print Management Solutions dramatically improves productivity through optimization of the printing environment and objectively analyzing print quality.

KHS-AI is the system handling overall control of the printing process; PDC series checks and adjusts print quality; and PQA series offers continuous inspection features to maintain quality throughout the run, continuously supporting operator tasks.

By utilizing KHS-AI, PDC and PQA together, high-quality prints can be continuously and reliably produced in less time than ever before.

For integrated control	For checking print quality	For maintaining print quality
Integrated control system that manages job data, device interlinking, and efficient changeover	Print quality analysis with automated control to quickly move into production	Print quality is maintained through quality inspections and various automated controls.

Changeover	Test printing/start-up	Production Printing

KHS-AI

- High-precision presets
- Smart Sequence
- Parallel makeready

PDC Series

- Color management/automatic register adjustment
- Smart feedback
- PDF comparator system

PQA Series

- Quality inspection
- Color control/automatic register adjustment

KHS-AI

This system facilitates a reduction in preparation time and paper waste by integrating control of the entire press.

PDC Series

Standardizes quality by checking and adjusting work to reduce paper waste.

PQA Series

Ensures a continuous high level of quality through in-line print quality inspections.

KHS-AI

KHS-AI [Advanced Interface]

Have you considered these challenges?

Reducing the time taken to set-up the press

KHS-AI supports operators with an intuitive interface.

Reducing the time required for changeover preparation

The evolutionary smart sequence shortens changeover preparation time.

Reducing paper waste

The revolutionary smart sequence feature shortens job changeover preparation time.

This system facilitates a reduction in preparation time and paper waste by integrating control of the entire press.

KHS-AI is a revolutionary productivity enhancement system that receives job data from the MIS-linked KP-Connect Pro and integrates control of the entire press.

Since many of the tasks required for changeover are performed simultaneously, preparation time is greatly reduced.

Moreover, as the press is also equipped with the high precision preset function that optimizes preset data according to the changes in materials and printing environment, it is possible to significantly reduce paper waste.
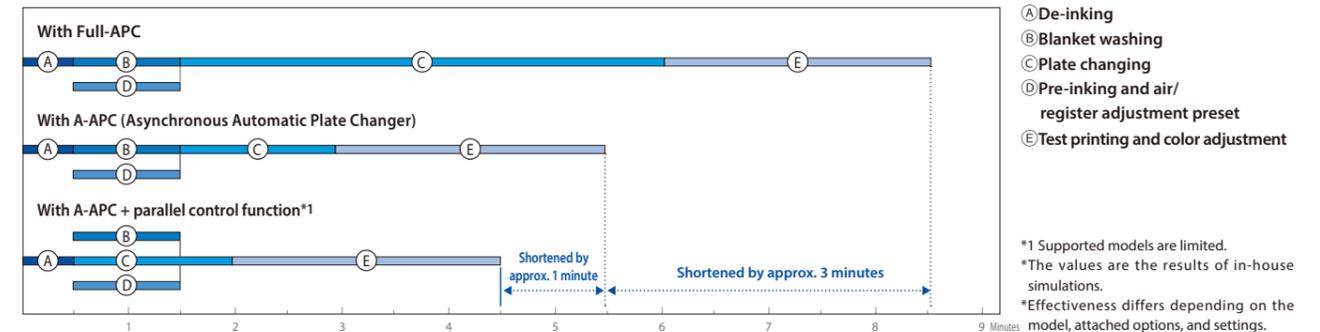
Sheetfed KHS-AI

Easy to use

Our touchpanel is user-friendly, easy to navigate, and designed with intuitive grouping of relevant information on display, reducing the need to change screens. For example, on the "job list" display, the changeover status can be seen at a glance by displaying the ink and paper information. Further, main printing operations such as ink key and plate registration, as well as PDC and PQA operations, can be performed on a single screen.
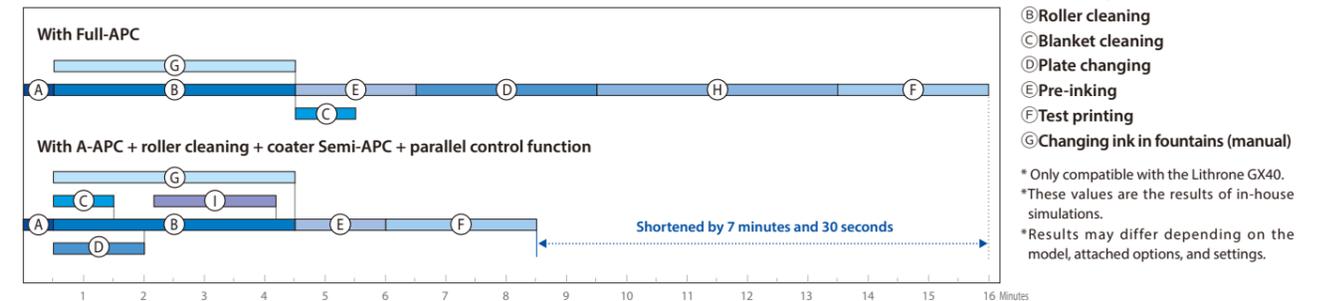
Smart Sequence

Smart Sequence reduces operator workload, human error, and shortens changeover time through automating almost the entire print preparation process between jobs. Time is further decreased with "parallel makeready" that performs plate changing, blanket washing, and pre-inking (roller cleaning for package printing) in parallel.

For commercial printing

Ⓐ De-inking
Ⓑ Blanket washing
Ⓒ Plate changing
Ⓓ Pre-inking and air/register adjustment preset
Ⓔ Test printing and color adjustment

With Full-APC

With A-APC (Asynchronous Automatic Plate Changer)

With A-APC + parallel control function*1

Shortened by approx. 1 minute

Shortened by approx. 3 minutes

*1 Supported models are limited.
*The values are the results of in-house simulations.
*Effectiveness differs depending on the model, attached options, and settings.

Parallel Makeready for Package Printing

The graph below compares changeover time for two-color changing for the Lithrone GX40 (6-color coater equipped with H-UV L (LED)), without cleaning ink duct rollers.

Ⓐ De-inking
Ⓑ Roller cleaning
Ⓒ Blanket cleaning
Ⓓ Plate changing
Ⓔ Pre-inking
Ⓕ Test printing
Ⓖ Changing ink in fountains (manual)

With Full-APC

With A-APC + roller cleaning + coater Semi-APC + parallel control function

Shortened by 7 minutes and 30 seconds

* Only compatible with the Lithrone GX40.
*These values are the results of in-house simulations.
*Results may differ depending on the model, attached options, and settings.

High Precision Preset Function

Paper waste at print start-up is reduced to an absolute minimum, makeready time is shortened, and resources are substantially saved by automatically analyzing and calibrating preset data and optimizing color matching according to changes in the machine, the printing environment and printing materials.
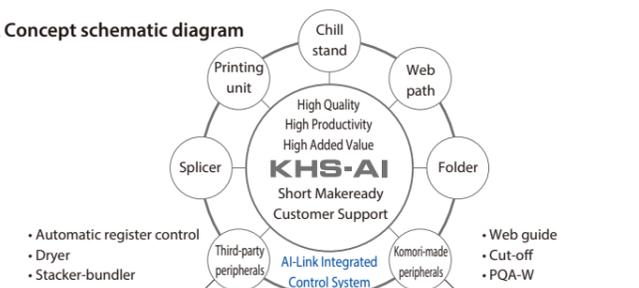
Automatic calibration using update results

Komori sheetfed offset press

Changes in environment
Printing materials

Paper grade
Paper size
Fold specification

Komori web offset press

Web Press KHS-AI

AI-Link (Integrated Control System for Web Offset Presses)

AI-Link provides total control of peripheral devices like the dryer in addition to control of all units from the splicer to the folder. As the AI-Link controls the entire unit, paper waste can be greatly reduced and productivity increased.

AI-Link Concept schematic diagram

Chill stand
Printing unit
Web path
High Quality
High Productivity
High Added Value
Splicer
KHS-AI
Folder
Short Makeready
Customer Support
AI-Link Integrated Control System
Third-party peripherals
Komori-made peripherals

• Automatic register control
• Dryer
• Stacker-bundler

• Web guide
• Cut-off
• PQA-W

* Content of this catalog includes optional functions.

PDC Series

Print Density Control Series

Have you considered these challenges?

Reducing time spent on register and color matching work

Work time can be reduced by using the automated functions in PDC-SX and PDC-SG.

Identifying printing problems during the first printing run

Quality checks that compare data can be performed automatically using the PDF comparator.

Stabilizing quality

Work previously performed by the operator is digitized and automated, standardizing work and unifying quality.

Standardizing checking and adjustment work helps reduce paper waste and shorten adjustment time.

PDC Series devices are systems that support the operator by digitizing and automating register and color matching, and quality checking work that used to be performed manually.

Changeover time can be considerably shortened and paper waste significantly reduced by performing color control at print start-up with the Smart Feedback function linked to KHS-AI.

Compatible with ISO 12647-2, the international print standard, as well as G7 and JapanColor standards, the PDC system is indispensable for standardizing printing.

Moreover, printed material and plate data can be compared by installing the PDF comparator (PDC-SX option.)
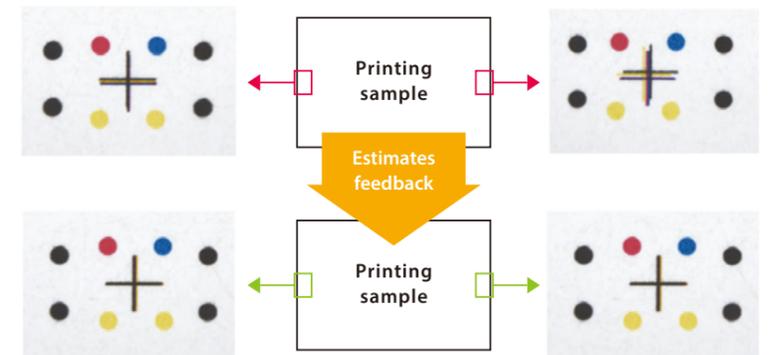
Color Control Function

Density, L*a*b* values, dot gain, etc., are measured and digitized by scanning the color bar on the paper with the PDC Series. Additionally, the PDC-SX also accommodates the color bar in the center of the sheet by means of the automatic X-Y travel system. When the results and the target density differ, the PDC Series links with KHS-AI and automatically adjusts the ink key openings. As spot measurement of critical points are also supported, color control can be conducted at an even higher level. Furthermore, the results of whether the printed matter complies with standards can be output as a report. Density of measurement sheets, △E, dot gain, etc., are tabulated by color, and the average of all patches, and the maximum and minimum values are calculated.
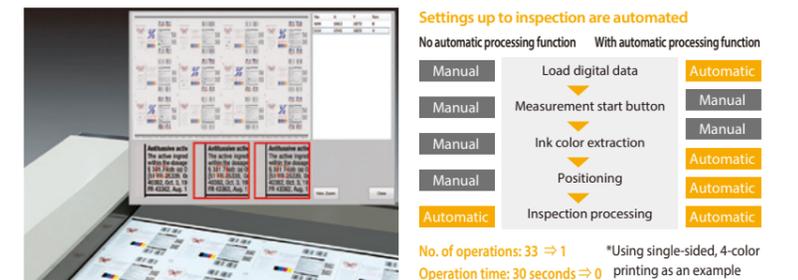
Automatic Register Adjustment Function (PDC-SX)

High precision register adjustment is performed with Komori's proprietary register marks. Checking of color, front/back register, and image positioning on the paper are performed automatically and fed back to the press immediately if any deviations are found. Not only can human errors be prevented as matching is performed by values rather than human judgment, but accurate matching is possible with less manual checks.

Printing sample
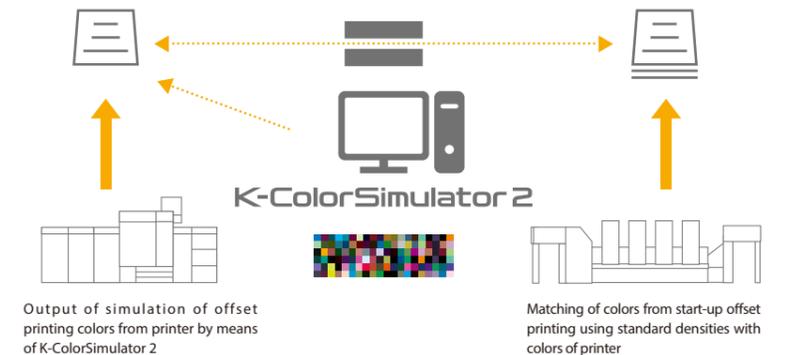
Estimates feedback

Printing sample

PDF Comparator System (PDC-SX option)

The PDF Comparator System is an offline comparator that can be installed as a PDC-SX option. It uses image sensors to read the printed matter and compares it with the PDF data to enable the operator to check for missing characters etc. in the initial printing stage. In addition, the required settings are configured automatically up to the start of inspection. Repetitious operations are eliminated and tasks are streamlined. The color bar and register marks are also measured when the printed matter is scanned.

Settings up to inspection are automated

No automatic processing function		With automatic processing function
Manual	Load digital data	Automatic
Manual	Measurement start button	Manual
Manual	Ink color extraction	Manual
Manual	Positioning	Automatic
Automatic	Inspection processing	Automatic

No. of operations: 33 ⇒ 1   *Using single-sided, 4-color
Operation time: 30 seconds ⇒ 0   printing as an example

CMS Compatible

Using K-ColorSimulator 2, Komori's own CMS software, high level color matching between the offset press and a range of printers can be achieved simply by measuring the K-Color chart in the margin of the printed sheet using a PDC-SX. With a proof consisting of a simulation of the offset printing colors that is output ahead of time, waste in the color matching work at printing can be considerably reduced.

K-ColorSimulator 2

Output of simulation of offset printing colors from printer by means of K-ColorSimulator 2

Matching of colors from start-up offset printing using standard densities with colors of printer

PDC-SX line-up: Spectral Print Density Control

PDC-SX

Hi-spec model with color control/automatic register adjustment functions

PDC-SX measures the color and register once and the results are fed back to the press. Measurements are possible with the automatic X-Y travel system regardless of the color bar position.

PDC-SG

High cost performance model for color control

The measurement results of density and L*a*b* values are fed back to the press. As the spectral measurement head is detachable, it supports not only automatic travel in the X-direction, but spot measurements as well.

PQA Series
Print Quality Assessment System Series

Have you considered these challenges?

Stabilizing quality

PQA Series systems ensure quality is maintained because all sheets are inspected with the same criteria.

Preventing defective sheets from being mixed in

Designed to prevent defective sheets from being mixed in. Tape inserter, double delivery*, and sheet numbering* can be selected.

Includes options.

Resolving workforce shortages

Quality control, register matching, and color control are automated, so the press can be operated efficiently with minimal manpower.

Maintains a high level of quality control

through in-line print quality inspections.

The PQA Series is a quality control system that checks for printing problems such as scumming, ink splashes, color variations, and so on.
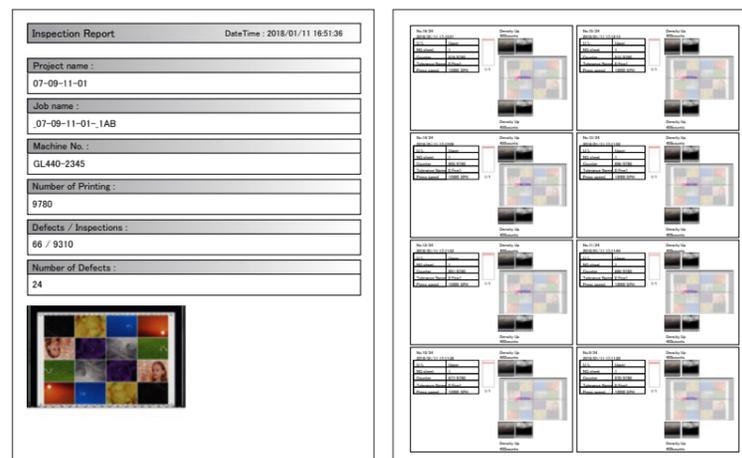
Previously, the operator was required to check for these items visually by regularly sampling printed sheets. However, these systems inspect all sheets in-line on the press according to the same assessment criteria to ensure high-level print quality control.

If a defective sheet is found, the operator is immediately notified and defective sheets are prevented from being sent to postpress with the production sheets.

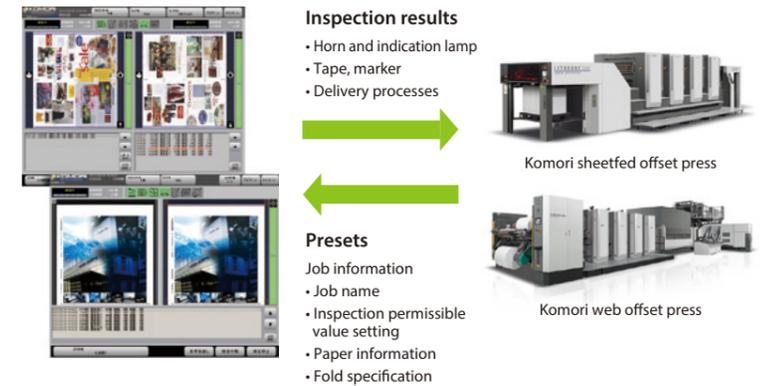The PQA Series in the system that symbolizes Komori's Autopilot.

Print Quality Inspection Function

An image is scanned with a high-precision CCD camera and lens utilizing light source control technology. Any printing problems are detected by comparing the image to a reference image. Komori's proprietary inspection algorithm is used to extensively compare the initial reference image with the image printed on the sheet. Any difference found is detected as a defect. The tape inserter and optional double delivery automatically activate, preventing defective sheets from moving to postpress. The inspection history data is saved in a database and can also be monitored over a network.

Press Interlock Function

The inspection process is extremely simple. At job changeover, the system is linked to the job data from KHS-AI, and the job name and printing paper information necessary for inspection is automatically set. Simple, automated operation is assured by Komori's total integrated system, including the automatic start of inspection by a link to the production sheet counter of the press when production printing starts.

Inspection results
- Horn and indication lamp
- Tape, marker
- Delivery processes

Komori sheetfed offset press

Presets
Job information
- Job name
- Inspection permissible value setting
- Paper information
- Fold specification

Komori web offset press

Detection mode changed automatically according to press status
- Start of production printing, blanket washing etc.

Color Control/Automatic Register Adjustment Functions

PQA-S V5 offers optional functions: color control and automatic register adjustment. Quality can be checked easily in real time by measuring the color bar and register mark in-line. Color and registration can also be controlled automatically to fall within the criteria.

*Operating conditions also apply to the automatic register adjustment function.

Inspection/color control model: Print quality inspection + color control*[1]

All-in-one model: Print quality inspection + color control*[1] + automatic register control

*[1] Color control is performed by the color patch system (located on gripper edge or in center)
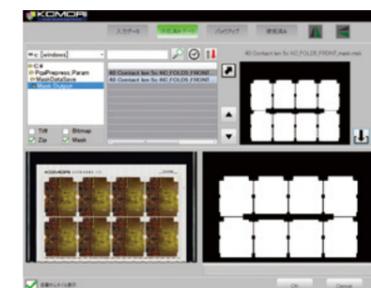
PQA-S color control screen

Sheet Numbering System

The sheet numbering system can be installed on the PQA-S V5 as an option. By numbering each sheet on the feeder board, defective sheets can be found more reliably. This also leads to improved traceability and ensures high-level print quality control.

Automatic Mask Creation Software

Automatic mask creation software can be selected optionally. Data is created from the die-cutting image preventing defect detection in unnecessary areas. This further improves quality control and efficiency for package printing.

Automatic mask creation screen   Mask settings screen

Inspection Report   DateTime : 2018/01/11 16:51:36

Project name :
07-09-11-01

Job name :
_07-09-11-01-_1AB

Machine No. :
GL440-2345

Number of Printing :
9780

Defects / Inspections :
66 / 9310

Number of Defects :
24

PQA Line-up

PQA-S Series In-line Print Quality Assessment System for Sheetfed

PQA-S V5

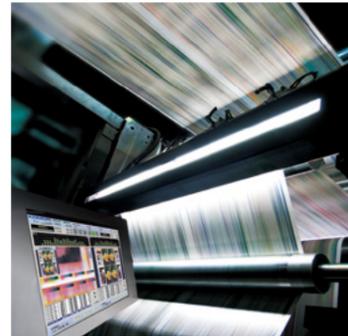## Multifunctional model meeting a wide range of needs

Komori proprietary software reduces false detections due to changes in the sheet position, further enhancing detection accuracy. Different levels of inspection can be set for specific areas of the sheet, hence enabling highly accurate inspection for crucial points. There are also models that have color control functionality and automatic register adjustment as well as quality inspection for various printing fields and requirements.

PQA-W V5 Print Quality Assessment System for Web

A high-performance camera inspection system specialized for Web Offset Presses

The adoption of cutting-edge technologies reduces issues that are unique to web offset presses, such as false detections caused by curving or expansion/contraction of the web, and ensures high-efficiency detection. The PQA-W V5 combines Komori's technical capabilities.

* Restrictions apply to presses on which these products can be equipped and combinations of models and functions.

KP-Connect Pro
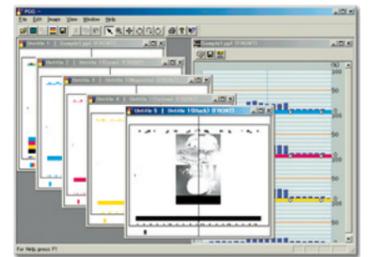
Converting a Printing Factory into a Smart Factory

KP-Connect Pro enables digital process management by compiling work schedules and progress information for all printing processes in real time, visualization, as well as with automated links to MIS and production scheduling functions. Connected automation is a Komori ICT concept of automatically linking pre-press, press, and postpress with KP-Connect Pro and converting a printing factory into a smart factory.

PCC PQC CIP Communicator

The PCC converts digital data into an ink profile

This software converts digital data from prepress into a PQC-format ink profile for the press. PPF, CMYK-TIFF, and other data is converted into a PQC-format ink data for Komori presses. Using the preview image from CIP4/PPF data to calculate the area ratio and presetting the ink keys with this accurate data has become standard practice for Komori.

KID Komori Info-Service Display

This is an information display on which all necessary data can be viewed at a glance

KID groups the information necessary for an operator to provide it in a timely manner. Printing press operating conditions, and KHS-AI, PDC, and PQA information is displayed together to support the operator work-load.

Press monitor

Display of printing image in actual dimensions