



SOLUTIONS FOR > **WEB OFFSET**



TOTAL QUALITY CONTROL AT 360°



grafikontrol
INSPIRED BY TECHNOLOGY



TQC360, A NEW CONCEPT FOR DEFECT-FREE PRODUCTION AND WORKFLOW MANAGEMENT

TQC-360° is the newest modular platform for Grafikontrol's products. It has been developed to give printers a complete solution for quality assurance. With the TQC-360° concept, Grafikontrol offers a full range of quality control to the printing and converting industry through production, application, and processes and services. Our "all around" approach to the customer combines high performing products and excellent service.

The TQC-360° products integrate into any web application. Customers benefit from the modular design which allows them to start with the features they need and upgrade at any time.

The components that make up the TQC-360° line can satisfy any customer need. They can operate separately or together through a single operator interface if desired. Tailor made solutions can be designed to fit non-standard applications.

INSPIRED BY TECHNOLOGY

Grafikontrol has been recognized as worldwide leading manufacturer of high performance equipment for the graphic industry for more than 45 years. We marry the best of high-tech components with the essence of Italian engineering to manufacture best of industry products with a heart "Made in Italy".



PRODUCTS

- COLOR REGISTER CONTROL WITH MICROMARKS
- CUT-OFF AND SIDELAY REGISTER CONTROL
- SPECTRO-DENSITOMETRIC CLOSED LOOP COLOR
- "PAPER MONITORING" WEB SURFACE ANALYSIS AND DEFECT INSPECTION
- 100% PRINT INSPECTION SYSTEM

APPLICATIONS

- COMMERCIAL PRESSES
- NEWSPAPER
- METAL PRINTING
- LIQUID PACKAGING
- FOLDING CARTON

SERVICES

- REMOTE CONNECTION & ASSISTANCE
- LOCAL SERVICE
- ANNUAL SERVICE CONTRACTS
- 15 YEARS SPARE PARTS AVAILABILITY

PROCESSES

- OFFSET
- DIGITAL



TQC
360°

CR25-CR26



> COLOR REGISTER CONTROL

page **6**

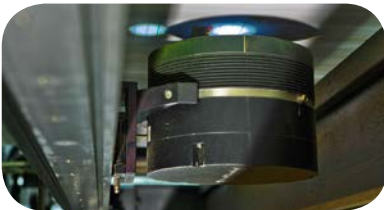


CR25

The CR25 register control system has been developed using advanced electronic technologies, such as high-speed matrix video cameras, specially made for the purpose. These have made it possible to enormously reduce the space occupied by the register marks (micromarks) for automatic control of circumferential and lateral color register on web-offset presses in commercial and newspaper printing.

CR26

The cameras can be positioned, on request, between the last printing unit and the drier, in order to ensure immediate response to variations in register and thus further reduce the number of waste copies. The cameras read the marks on free paper, unsupported by a roller, with a tolerance of oscillations in the web of ± 7 mm.



CR25TPLT



> CUT-OFF AND SIDELAY REGISTER CONTROL

page **8**



The CR25TPLT longitudinal and sidelay register control system for cutting and folding has been developed using advanced electronic technologies, such as high-speed matrix video cameras, specially made for the purpose. These have made it possible to enormously reduce the space occupied by the register marks (micromarks).

COLORSCAN



> MARKLESS CLOSED-LOOP COLOR CONTROL, WITH SPECTROPHOTOMETRIC ANALYSIS

page **10**



In recent years printers have required their color control systems to reduce space to save money. COLORSCAN has done this by eliminating the color bars. The COLORSCAN system measures the optical density and L*a*b* values of the colors on live production in 'real time', analyzing each sector across the web by means of a mobile camera placed after the last printing unit. The system automatically adjusts and maintains the color values by acting on the ink keys and eventually on the inking roller speed.

**PM3****> WEB DEFECTS DETECTION**page **12**

Paper is more and more a critical factor in the printing process. The continuous push for higher productivity means that web breaks, paper waste and monetary claims due to web quality, are key factors in reaching profitability goals. Modern wide presses and high production speeds require more efficient and reliable systems to detect paper defects and to identify reasons for web breaks. The PM3 system provides a control of the paper from the reel-stand to the press delivery, to continuously check the paper quality and allow the operator to distinguish web breaks due to the web quality from those due to press settings.

LYNEX**> 100% PRINT INSPECTION**page **14**

The demand for total print control is satisfied by our innovative 100% inspection system. The LYNEX assures the control of the entire print repeat reporting and storing every defect detected during the production. The system provides this data in roll maps and generates production reports for subsequent analysis and workflow use.

- Real time process analysis, the system operates at web speed up to 1000m/min with clear discrimination of defect by size and type
- 4 K-pixel linear cameras for defect detection on any type of substrate and web width
- Job reports & Waste management
- Integration to the plant network for the production data management
- The PDF/LIVE Master comparison Software allows an easy and quick verification of the make-ready live printing with the relative pre-press file

TECHNICAL DATA**> CR25-CR26 • CR25TPLT • COLORSCAN • PM3 • LYNEX**page **18**

CR25-CR26

► COLOR REGISTER CONTROL WITH MICROMARKS



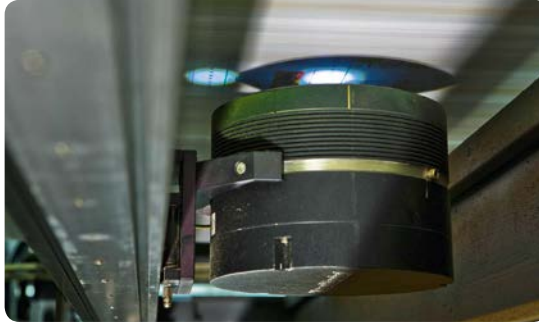
► TECHNICAL FEATURES

- CR25 register control system uses specially made high-speed matrix video cameras, which make it possible to reduce the register marks (MicroMarks) in very small spaces (7 x 7 mm).
- Multiprocessor units with DSP (Digital Signal Processing) Technology.
- Cameras can capture 200 images per second, and the marks are read on each cylinder revolution.
- Speed of operation from 15 to 1500 m/min.
- MicroMarks can be located anywhere on the printed web. They are not sensitive to print conditions and can therefore always be identified by the cameras.
- Error sensitivity: 0.01 mm.
- Completely automatic register mark search and lock on.
- LED light sources, with a lifetime of over 100,000 hours (11 years).
- When register errors exceed the preset value, an alarm and the waste ejector can be activated automatically.
- The system is configured for remote support through a dedicated VPN connection.



CR26

- **Register control with cameras placed before the dryer**
- On request, cameras can be positioned between the last printing unit and the drier in order to ensure immediate response to variations in register, and thus further reducing the number of waste copies.



CR25WG – CR26WG

- **Sidelay register control of the main web**
- It enables centering the print under the slitters by interfacing with the web guide, in order to ensure correct cutting into ribbons.



CR25FO

- **Fan-Out control**
- Automatic control of width variations in the printed web and skew of color print register. This can be supplied either separately or integrated in the color register control.



MAIN OPERATOR SCREEN, NEWSPAPER PRESS CONFIGURATION



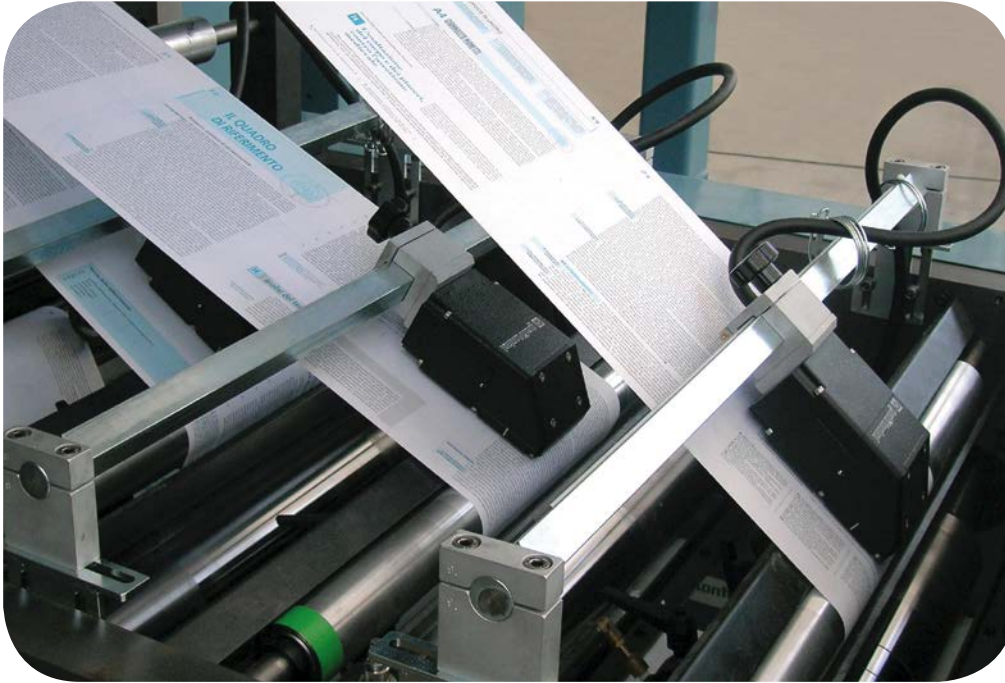
FAN-OUT CONTROL SCREEN



MAIN OPERATOR SCREEN, COMMERCIAL PRESS CONFIGURATION

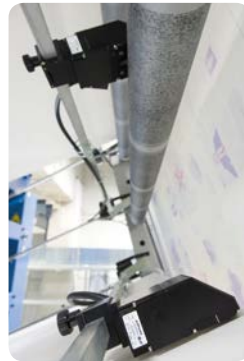
CR25TPLT

➤ CUT-OFF AND SIDELAY REGISTER CONTROL ∞



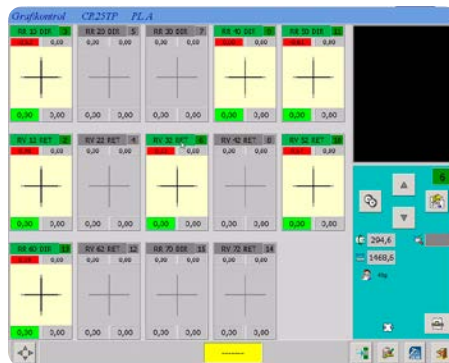
➤ TECHNICAL FEATURES

- CR25TPLT longitudinal and sidelay register control system uses specially made high-speed matrix video cameras, which make it possible to read register marks (MicroMarks) in very small spaces (6 x 4 mm).
- Supplied separately or integrated with the CR25-CR26 color register control, this system provides automatic control of the longitudinal and sidelay register of one or more webs on folders, rotary cutters, perforators, etc.
- Multiprocessor units with DSP (Digital Signal Processing) Technology.
- Cameras can capture 200 images per second, and the marks are read on each cylinder revolution.
- Speed of operation from 15 to 1500 m/min.

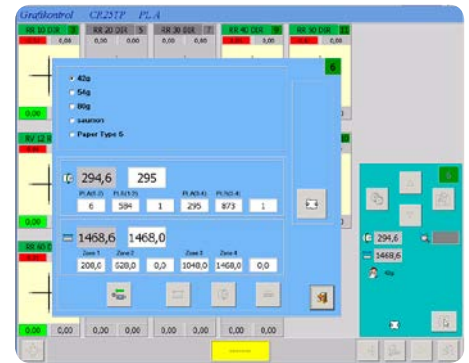


MOTORIZED BARS (OPTIONAL)
FOR THE AUTOMATIC
POSITIONING OF CAMERAS
ON THE MICROMARKS

- MicroMarks can be located anywhere on the printed web. They are not sensitive to print conditions and can therefore always be identified by the cameras.
- Error sensitivity: 0.02 mm.
- Maximum correctable longitudinal and sidelay error ± 100 mm without operator's intervention.
- Correction of sidelay error with or without print.
- Completely automatic register mark search and lock on.
- Video cameras can be mounted on motorized bars presettable from the control console, which enables automatic positioning on the marks.
- LED light sources with a lifetime of over 100,000 hours (11 years).
- When register errors exceed the preset value, an alarm and the waste ejector can be activated automatically.
- The system is configured for remote support through a dedicated VPN connection.



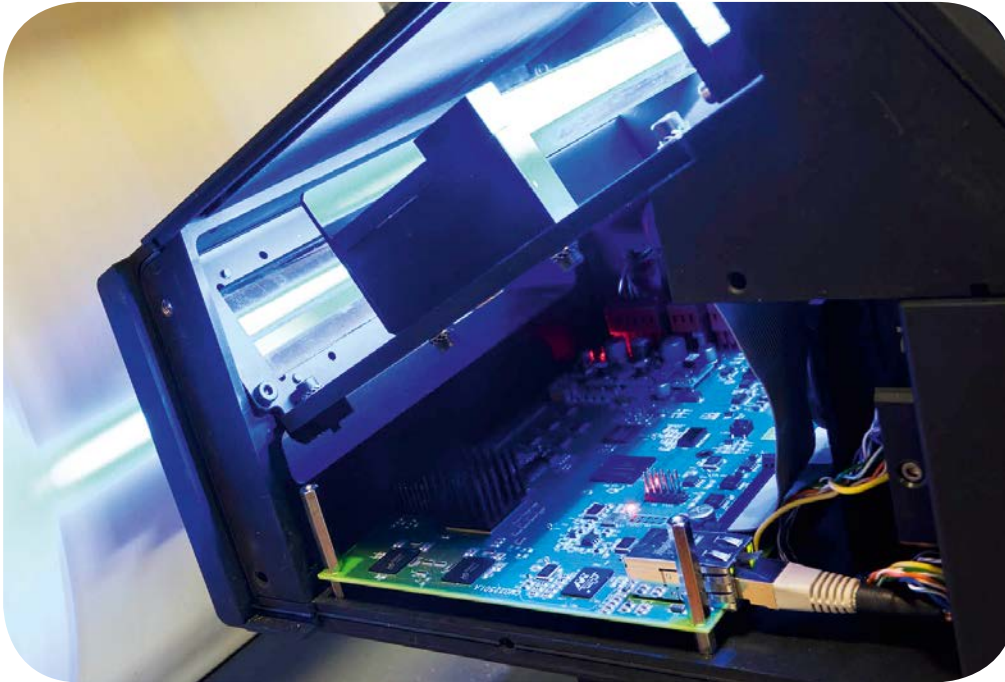
CUT OFF MAIN OPERATOR SCREEN



MOTORIZED CAMERAS SCREEN

COLORSCAN

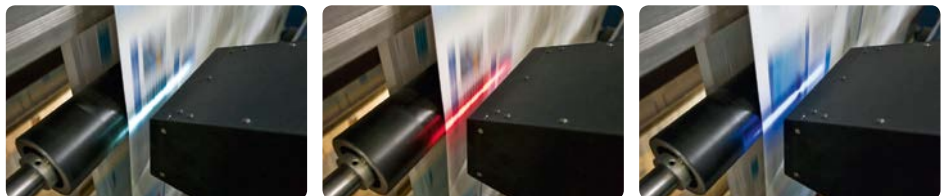
▶ SPECTRO-DENSITOMETRIC COLOR CONTROL SYSTEM



▶ TECHNICAL FEATURES

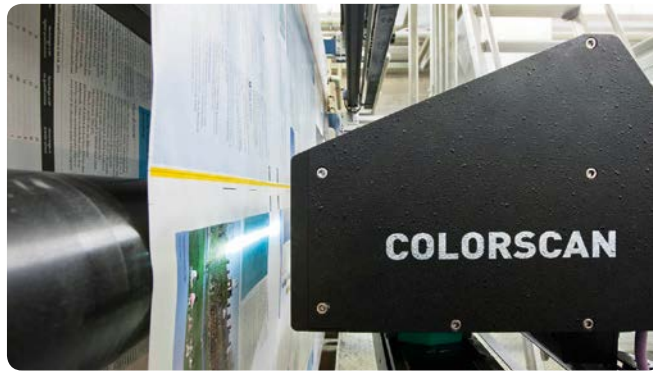
- COLORSCAN is an automatic closed-loop color control using in-line spectrophotometric and densitometric measurements.
- Fast and perfect color spectrophotometry/density control, along with a userfriendly operation and a fully-automatic start-up ensure the best quality of the printed product at any press speed (from 50 to 1000 m/min) and during the entire production.
- A specially made video camera allows measurement and control of CIE L*a*b* values through the reading of images or a dedicated color bar with customer specified dimensions.
- Precise and fast corrections on the ink keys are made comparing the measured values and the values of a pre-press file.

MODULATING LIGHT WAVES
FOR A WIDE SPECTRAL
ANALYSIS OF COLOR

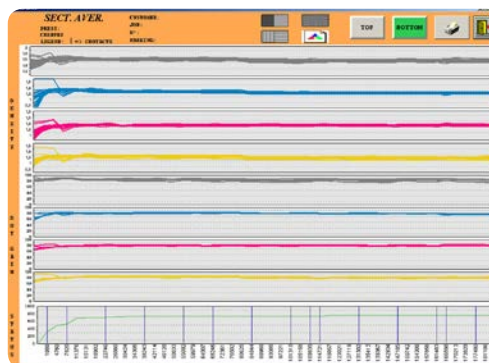




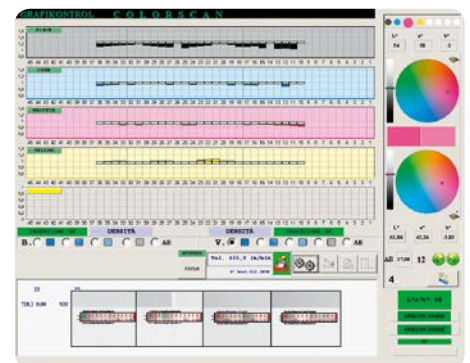
MEASURE
OF COLOR PARAMETERS
FOR 4 INK KEYS
SIMULTANEOUSLY



- LED light sources, with a lifetime of over 100,000 hours (11 years).
- Scanning field of 160 mm (4 ink keys) associated to high-speed camera movement, guarantee reduced time for scanning the whole web.
- Elimination of manual measurements.
- Repeatability and maximum accuracy in measuring the densitometric values: $\pm 3\%$ of average value.
- The chromatic parameters displayed in real time are:
 - Optical density
 - Dot Gain
 - CIE L*a*b* values
 - Chromatic balance
 - Trapping
 - Slur
 - Print contrast
 - Differences from set-point and real measured color " ΔE "
- Database containing all measured chromatic values with consequent availability of quality reports up to single ink key details in any moment.
- Optical and/or acoustic signal when the dot gain exceeds the preset value.
- System COLORSCAN can manage data from pre-press, according to CIP3 standards, in order to preset inking profiles.
- The system is configured for remote support through a dedicated VPN connection.



REAL TIME TRENDS DISPLAY



MAIN CONTROL SCREEN

PM3

➤ PAPER MONITORING WEB SURFACE ANALYSIS AND DEFECT INSPECTION



➤ TECHNICAL FEATURES

- PM3 System continuously monitors paper from the reel stand up to the press delivery. It allows the operator a quick means to distinguish the web breaks due to the paper quality.
- For each roll, the system evaluates the average value of white paper in CIE L*a*b* coordinates.
- High resolution color cameras detect the critical defects of white paper, supplying information about the origin of breaks and paper quality with pictures and video clips that can be taken in different areas of the press. As option, cameras on mobile brackets can be supplied.
- Automatic loading of data relevant to the job and to the reel through connection to either the company network or to a bar-code reader.



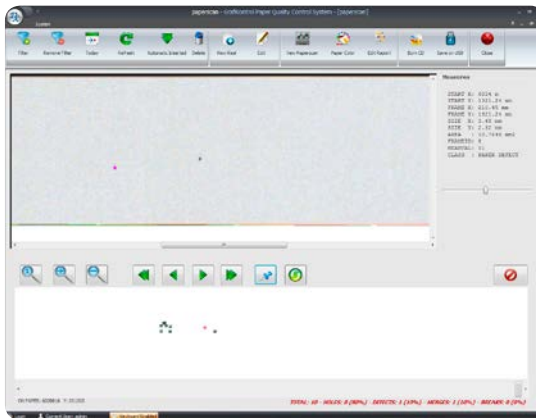
SOLUTIONS FOR >

WEB OFFSET

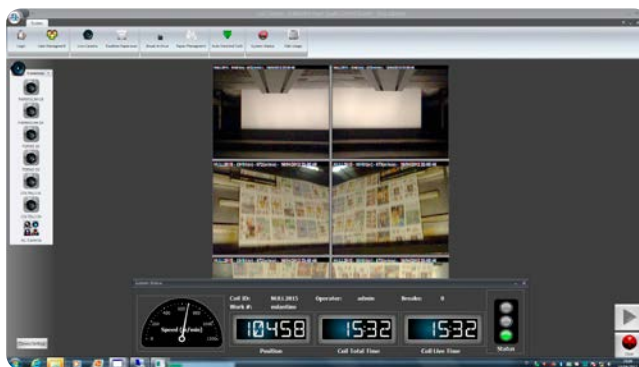
CAMERAS ARE POSITIONED AT CRITICAL POINTS OF THE PRESS (REEL STAND, DRIER ENTRANCE, SLITTERS)



ROLL MAPS DISPLAY AND JOB STORAGE CONSULTATION



- Information in real time.
- With a web break, the video clip is available immediately.
- The video clip in real time of a single camera or simultaneously of all connected cameras (Multi View up to 12 cameras) can be displayed.
- For every detected defect, the system detects and stores the following information by:
 - Type of defect
 - Size and position of the defect in the reel
 - Date and time of the paper break
 - Color pictures
 - Video clip associated to web break
- For every web break it is possible to print a report containing all information. Relevant documentation, video clips and cartography of the reel with defect statistics and white paper values in CIE L*a*b* coordinates are stored automatically.
- The system is configured for remote support through a dedicated VPN connection.



SELECTION OF INSPECTION CAMERAS AND REAL TIME VIDEO DISPLAY



WEB BREAK VIDEO CLIP ALLOWS EASY DISCRIMINATION OF THE CAUSE

➤ 100% PRINT INSPECTION. THE GUARANTEE FOR TOTAL QUALITY CONTROL



- LYNEX is a 100% print inspection developed by Grafikontrol to assure the total
- quality control during the printing process. The continuous inspection of the entire
- print repeat, with programmable sensitivities, allows the automatic detection
- of all print or substrate defects and a real time evaluation of the production.
- The immediate warning, when a flaw is detected, guarantees the elimination of
- defective material which optimizes your process and avoids claims. The modular
- architecture, combined with powerful hardware and dedicated algorithms for
- image processing, make the LYNEX a flexible and easy to use instrument for
- inspection on offset presses. LYNEX can operate as stand-alone module in
- multiple processes.



> SYSTEM CONFIGURATION

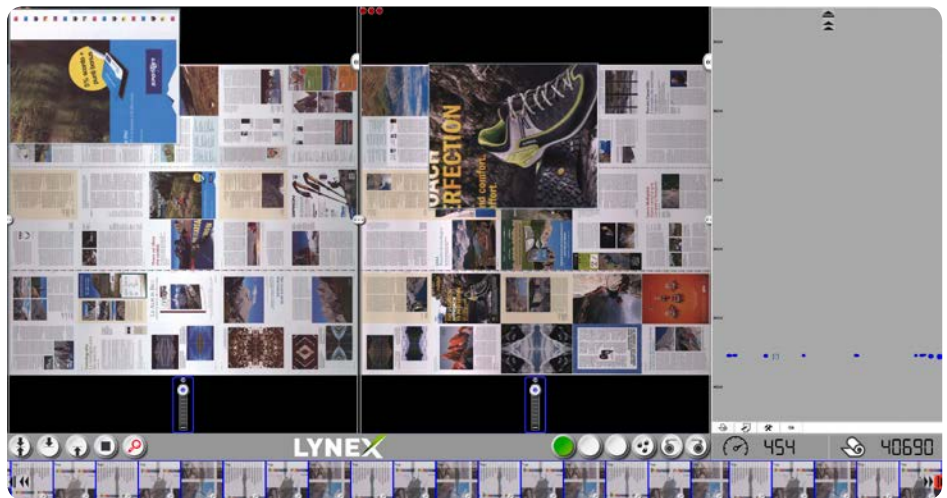
HIGH SPEED LINEAR CAMERAS

- LYNEX combines one or more 4K-pixel RGB linear cameras for an accurate real time inspection of the entire web width at production speeds exceeding 1000 m/min. The information from the cameras is processed through powerful hardware to provide accurate and reliable image inspection. Additional linear cameras can be dedicated to inspect the printed surface for the detection of defects down to 0.01 mm.

REAL TIME FULL PRINT REPEAT DISPLAY

- LYNEX provides as standard the real time display of the entire print repeat. Grafikontrol's dedicated image processor displays the live image at EVERY REPEAT as a full web viewer on a 32" or 55" UHD monitor. The operator can analyze the print conditions on the whole web and immediately intervene as needed. When a defect is detected the relative position is highlighted on the screen.

DIGITAL ZOOM ON IMAGE



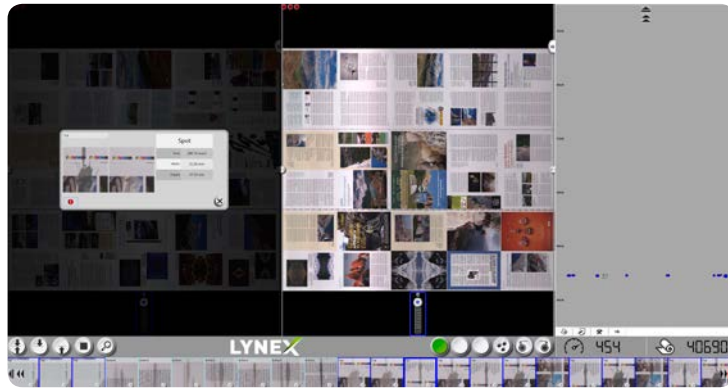
MODERN MULTITASKING USER INTERFACE

- "Easy and efficient" are the best terms to describe the new LYNEX operator interface. Press operators will not struggle to learn how to use the system functions, the gestures and actions are the same common ones used in smartphones and tablets. LYNEX is operated through a standard 23" HD 16:9 multitouch screen. Operators can navigate from screen to screen by just touching or sliding the image.

SYSTEM FUNCTIONS

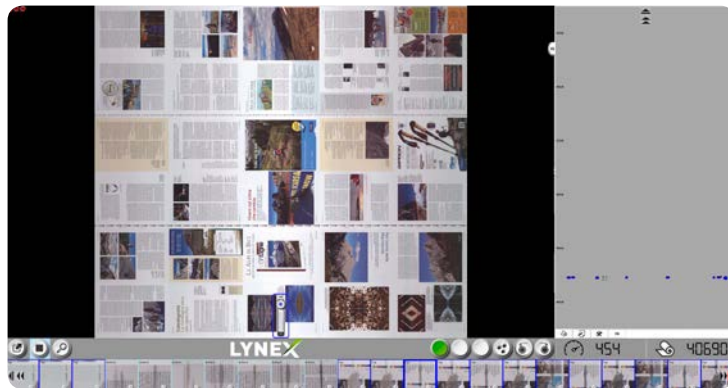
- Digital Zoom: 6X digital zoom allows the operator to digitally zoom on certain details over the entire print repeat by using the full print repeat monitor.
- Gallery of Defects: the chronological sequence of the defects and a scrolling function provide easy evaluation of the process.
- Different Sensitivity Levels: the operator can define the sensitivity for each classification of defect according to the job specification.
- Masking: undesired defects which cannot be removed from the printing, can be completely masked to avoid constant alarms.
- Sensitivity by Zone: normally the system works with sensitivity levels set for the entire print repeat, this special software allows the operator to select up to 24 zones (of various sizes) which can have different sensitivities for each type of defect.
- Job Report & Statistics: for the total traceability of waste the system produces a defect map for each printed roll showing in chronological order the defect, its coordinates and a visual image for the reviewer.

DEFECT ANALYSIS



- PDF/LIVE Master Comparison: this software, used during a job make-ready, allows an easy and quick comparison of the live printing with the relative PDF pre-press file to check for any differences. The in-line comparison is of big help when printing different text languages or to detect faulty engravings. This function allows to detect errors of plate engraving and plate positioning.
- Δ -Color Monitoring: through the live print repeat tab displayed on the multi-touch screen the operator can easily select up to 24 points of measurement to monitor the color trend. The ΔE values are continuously updated and visualized.




CAMERA SINGLE VIEW



> TECHNICAL
DATA

- **CR25-CR26**
- **CR25TPLT**
- **COLORSCAN**
- **PM3**
- **LYNEX**

TECHNICAL DATA

	CR25-CR26 	CR25TPLT 	COLORSCAN 
APPLICATION AREAS	Web offset printing, Digital printing, Screen printing, Folding carton	Web offset printing, Digital printing, Screen printing, Folding carton	Web offset printing, Digital printing, Screen printing, Folding carton
TYPE OF SUBSTRATE	Paper	Paper	Paper
POWER SUPPLY	120-230V AC 50-60 Hz 1000VA	120-230V AC 50-60 Hz 1000VA	120-230V AC 50-60 Hz 1000VA
OPERATING TEMPERATURE	+5/+40°C	+5/+40°C	+5/+40°C
MEASURING RESOLUTION	0.01 mm	0.01 mm	0.03 density points
ERROR ADJUSTMENT	± 2 mm	Unlimited	-
MAX CIRCUMFERENTIAL ERROR DEVIATION	± 1.6 mm	± 100 mm	-
MAX SIDELAY ERROR DEVIATION	± 0.9 mm	± 7 mm (with fixed camera) ± 30 mm (with motorized camera)	-
SIDELAY ERROR ADJUSTMENT	± 2 mm	± 2 mm (with fixed camera) Unlimited (with motorized camera)	-
OPERATING WEB SPEED	15 - 1500 m/min	15 - 1500 m/min	50 - 1200 m/min
REPEATABILITY AND MEASUREMENT ACCURACY	-	-	0.03%
MAX WEB WIDTH WITH 1 CAMERA	-	-	-
DEFECT DETECTION	-	-	-
CAMERA RESOLUTION	640 x 480	640 x 480	2048 Linear camera
FRAME RATE / LINE RATE	200 fps Progressive scan CMOS	200 fps Progressive scan CMOS	70 KHz
CAMERA INTERFACE	LVDS	LVDS	Camera LINK



PM3



Gravure publication,
Web offset printing, Digital printing,
Screen printing, Folding carton

Paper

120-230V AC 50-60 Hz
1000VA

+5/+40°C

10 - 1000 m/min

2 m

1 mm²

1296 x 996 HR camera
1600 x 1200 SHR camera

30 fps Progressive scan CCD HR camera
55 fps Progressive scan CCD SHR camera

Gigabit Ethernet (1000 Mbit/s)

LYNEX



APPLICATION AREAS >

Gravure, Flexo printing, Web offset
printing, Digital printing,
Screen printing, Folding carton

TYPE OF SUBSTRATE >

Paper

SYSTEM PERFORMANCE

MAX WEB SPEED >

Up to 1000 m/min

MAX WEB WIDTH >

4000 mm

OPERATING TEMPERATURE >

0/40°C

ILLUMINATION UNIT TYPE >

Main illumination with dimmable
white LED, back side illumination,
lacquer flash, UV flash, embossing flash,
hologram flash

USER INTERFACE

TYPE >

23" TFT multi-touch screen
32" 4K - 55" 4K

RESOLUTION >

1920 x 1080 pixel - 2560 x 1600 pixel -
3840 x 2160 pixel

SIGNAL INPUT >

DVI - display port - HDMI

SUPPLY VOLTAGE

POWER SUPPLY >

115-230V AC 50-60 Hz - 1000 VA

SENSOR TYPE >

RGB line scan camera, camera link 85MHz
B/W line scan camera - GigE

OPTICS >

Digital 6X zoom

NUMBER OF CAMERAS >

Up to 4 cameras

RESOLUTION >

2048 pixel - 4096 pixel - 8192 pixel

MAX IMAGE RESOLUTION >

0.06 mm/pixel

MEASUREMENT VALUES

DATA EXPORT >

xml file

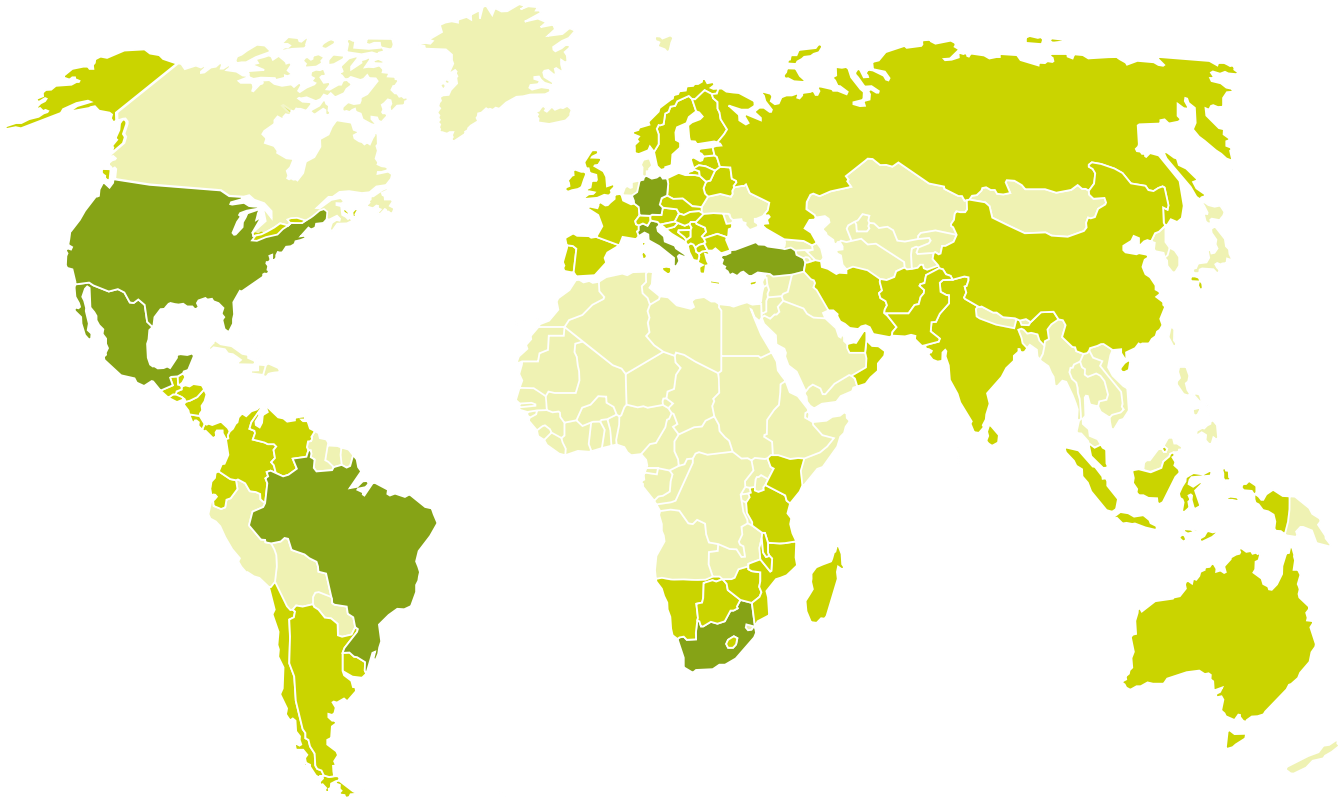
INPUTS / OUTPUTS

FUNCTION INPUT >

Splice - inking

OUTPUT FUNCTIONS/SIGNAL >

Sinoptic tower with acoustic alarm,
waste/out of tolerance signal



 SALES AGENCIES

 SALES AGENCIES
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