

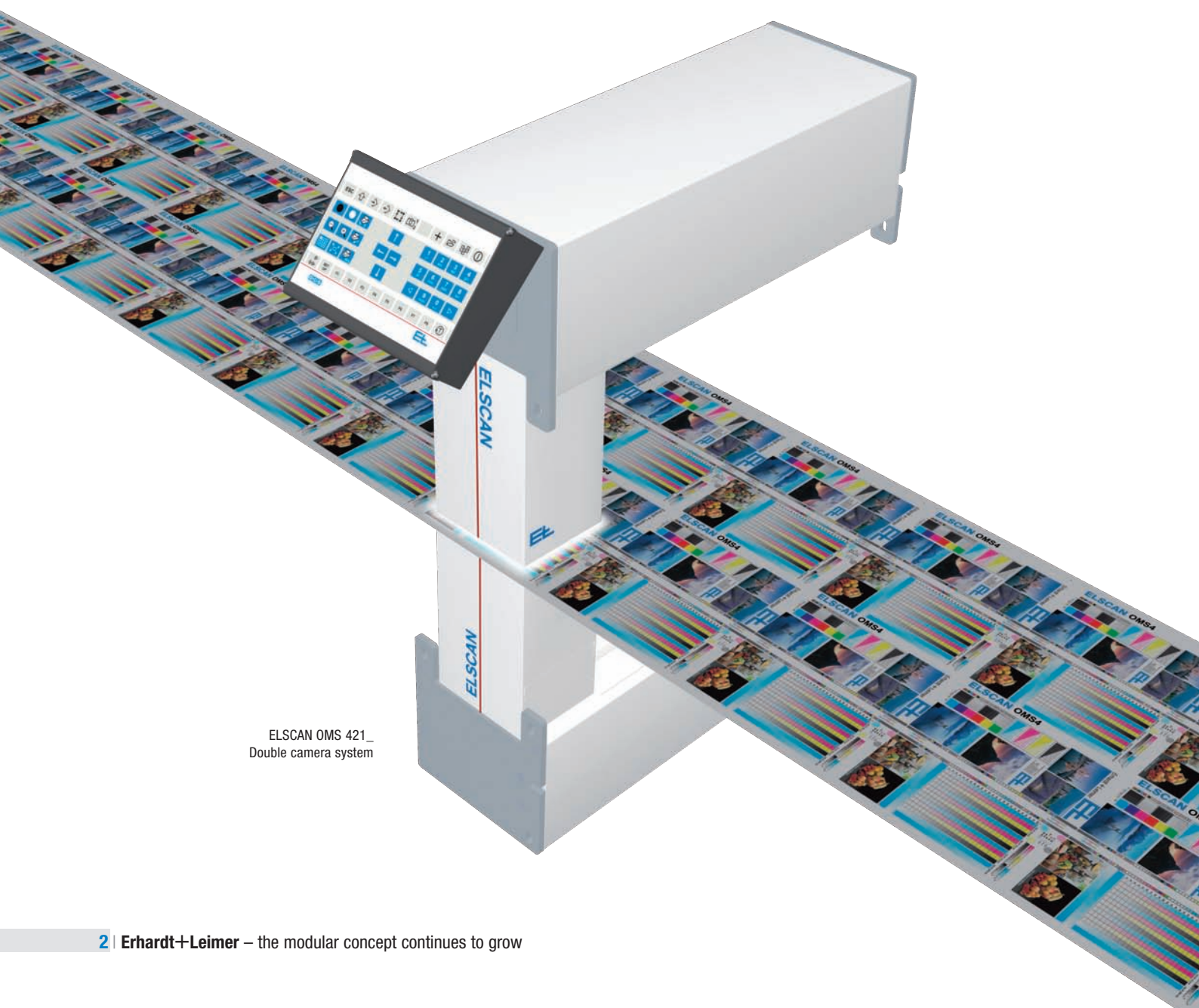


ELSCAN

**Web monitoring and
inspection systems**

Full digital monitoring and
inspection system for printed webs

ELSCAN – the modular concept
continues to grow



ELSCAN OMS 421_
Double camera system

Index

The ELSCAN product range from Erhardt+Leimer stands for significantly better print quality thanks to innovative technology. The related systems capture and process print images completely digitally. Due to the wide performance spectrum combined with a high degree of adaptability, ELSCAN permits individual system solutions for the most varied of tasks. Functions can be added to this concept at any time.

ELSCAN – Digital print image monitoring

ELSCAN OMS 4_1_	4
ELSCAN OMS 4112	6
ELSCAN OMS 4113	8
ELSCAN OMS 4114	10
ELSCAN OMS 4115 / 4116 / 4117	12
ELSCAN OMS 421_	14

Technical information

Dimensions	16
Enquiry form	18
Technical data	19

ELSCAN OMS 4_1_

Digital print image monitoring specially for the label, business form, flexo printing and converting sectors

Erhardt+Leimer, for years a world-leading manufacturer of web guiding equipment, has further developed print image monitoring and print image inspection with its own, smart ideas and applied its experience to the development and production of sensors and cameras.

In conjunction with the proven functionality and modularity of the ELSCAN family, ELSCAN OMS 4_1_ is also setting new standards in relation to customer benefit and price-performance ratio. The new diffuse area flash for a homogeneously illuminated print image and the 2 integrated fixed focus cameras with different focal lengths form the heart of this innovative development.

The print image monitoring is reliable, digital, direct and without any time delay; during this process the system switches from one camera to the other unnoticed by the user. This camera concept creates new possibilities for web monitoring, e.g., the simultaneous assessment of a repeat and section in detail, as well as moving image navigation.

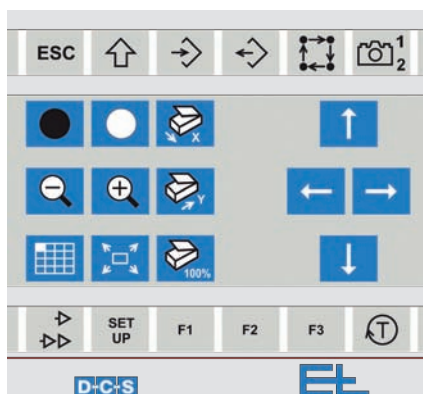
The practical functionality of ELSCAN has been retained.

The image stabilization, the simple selection of a required reference position as well as expanded software versions are also available as standard with ELSCAN OMS 4_1_. Based on this technology, the ELSCAN family will be continuously further developed and modular additions made. As a result ELSCAN will always be "fresh" and up-to-date.

ELSCAN OMS 4 provides important customer advantages:

- + High image resolution of the two cameras with 5 megapixels each
- + Up to 50 times magnification, e.g. of a register mark
- + Large field of view 120 x 90 mm
- + Digital image transmission with automatic white balance and color balance
- + Simultaneous 2 image display of the current production with varying image enlargement, e.g. scanning in the background and section with image enlargement in the foreground
- + Adapted quick scanning for the selection of an interesting print image position
- + Continuous display of the complete repeat or the scan

- + Image stabilization as standard
- + Wide range of different synchronizations possible: print mark and/or gearwheel sensor, encoder, digital connection and internal triggering with synchronization in relation to the web
- + Easy installation and integration of the system in the printing press
- + Compact design
- + Optimal acquisition of the web, even with very small distances between the edge of the web and the rear wall of the machine
- + Orientation-independent installation
- + For a different direction of web travel on the monitor, the camera is rotated by 90 degrees
- + Easy software update using memory stick
- + Very wide range of different language versions available as standard
- + On-screen display and status bar for easy communication in case of need for service
- + Pop-up help function on use with the mouse
- + Optional digital input and output



Keypad for ELSCAN OMS 4_1_



ELSCAN OMS 4_1_

Display of the maximum field of view of the CMOS image sensors 1 and 2

For field of view 1 the wide angle lens is fitted. The field of view is 120 x 90 mm.

For field of view 2 the telephoto lens is fitted and the field of view is 32 x 24 mm.

Using the digital zoom, a minimum field of view of 4 x 3 mm can be realized.

At the press of a button, the entire repeat can be acquired and displayed. This feature significantly eases navigation using the keypad or mouse.

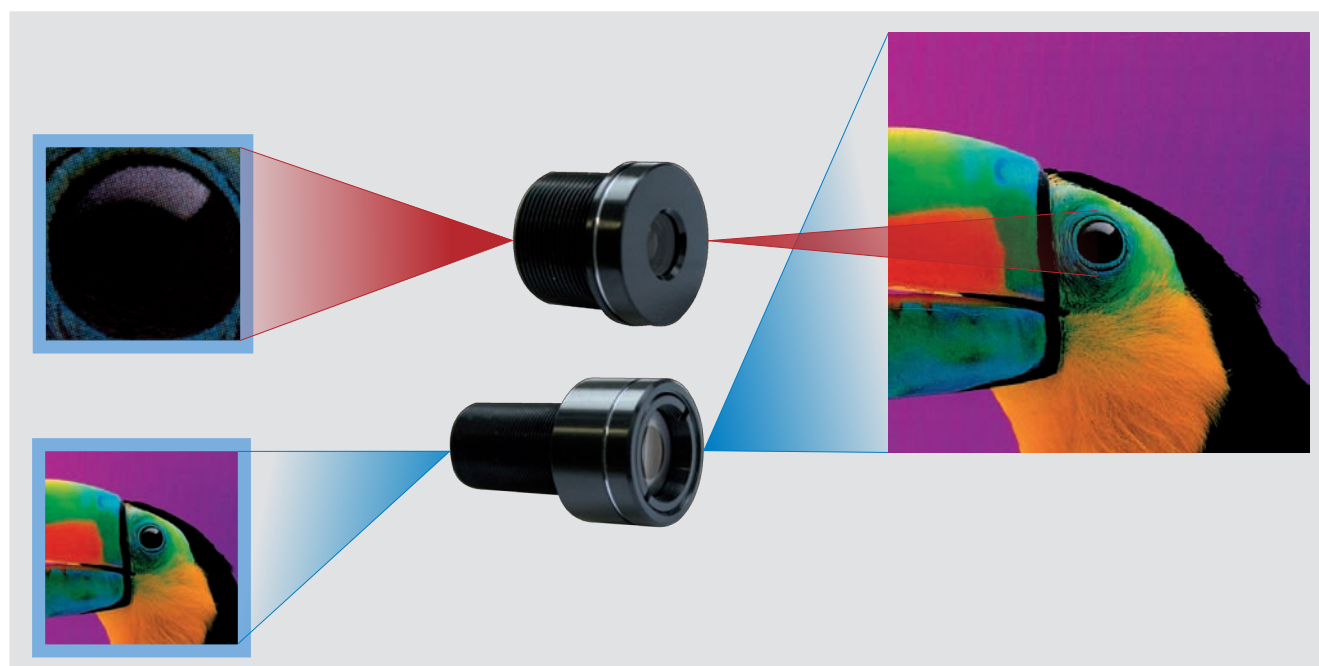


Function

The new camera system developed by E+L uses 2 fixed focus lenses with different focal lengths. The wide angle lens is offset a little to the side in relation to the center of the area observed and the image is projected on image sensor 1. The telephoto lens is centrally arranged and has a small field of view, for this reason the image sensor supplies 2 high resolution images.

During zooming the system switches between image sensor 1 and 2 depending on the required section of the image; the user is not aware of the switching.

The system operates fully digitally and as a result free of delay. It is therefore also possible to zoom and navigate within an image acquired. Applications for patents have been filed worldwide for this system, including the diffuse area flash.



ELSCAN OMS 4112

Digital print image monitoring specially for the label, business form and converting sectors

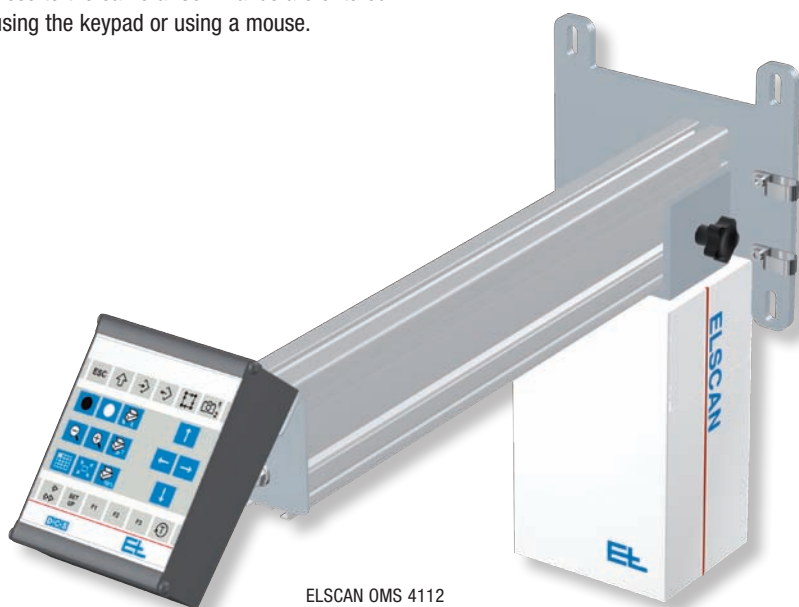
Based on the proven digital ELSCAN web monitoring technology, the manual version of the ELSCAN OMS 4112 was specially developed for monitoring narrow webs.

ELSCAN OMS 4112 is the basic version of the ELSCAN OMS 4 product range. It is a highly compact web monitoring system for installations where there is little space and is used preferably in narrow web label printing and converting sectors. ELSCAN OMS 4112 is always installed for easy access by the operator. The keypad is fitted to the crossbeam on the operator's side to suit the installation position.

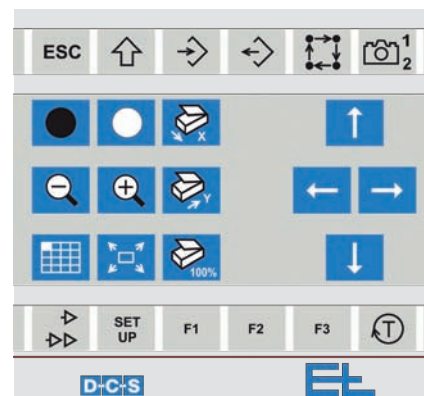
ELSCAN OMS 4112 enables the print quality to be assessed directly on the monitor positioned close to the camera. Commands are entered using the keypad or using a mouse.

ELSCAN OMS 4112 provides important customer advantages:

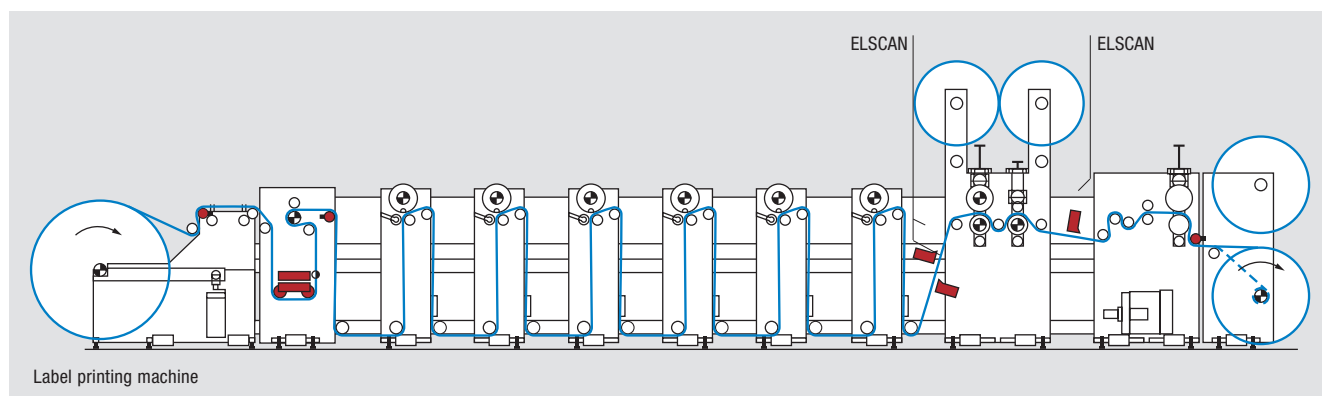
- + Standard scan in direction of web travel (Autoscan Y)
- + Standard master-print image comparison with simultaneously saved hotspot position that can be opened at the press of a button
- + Intuitive, direct operation using the mouse
- + Image stabilization in the direction of web travel
- + Direct switching between large, small field of view
- + Y position can be compared with the start of the repeat
- + Image stop function: The last 12 images can be opened from memory
- + Image manager: Screenshots can be produced using the mouse; these screenshots can be saved to a memory stick
- + Measurement function in horizontal and vertical direction
- + As standard the system can be expanded and upgraded
- + Very easy installation and integration of the system in the production line
- + Installation position as required
- + The camera housing can be rotated by 90° for different direction of web travel on the monitor; the max. resolution is retained
- + Operator's display can be mounted on the crossbeam on the side from which the system is operated and can be rotated; as a result very user-friendly
- + Optimal acquisition of the web, even with very small distances between the edge of the web and the rear wall of the machine (>50 mm)



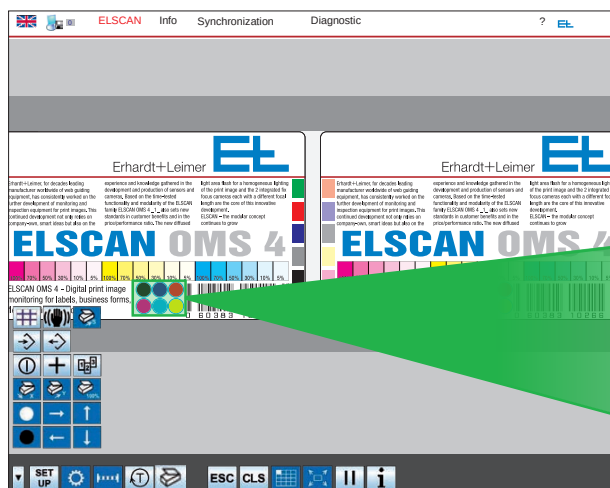
ELSCAN OMS 4112



Keypad for ELSCAN OMS 4112

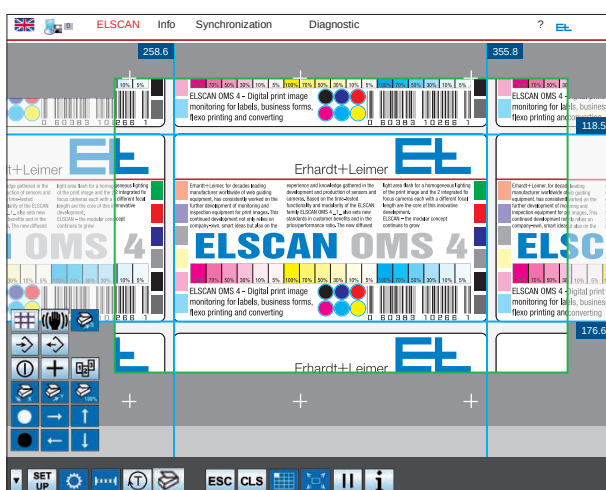
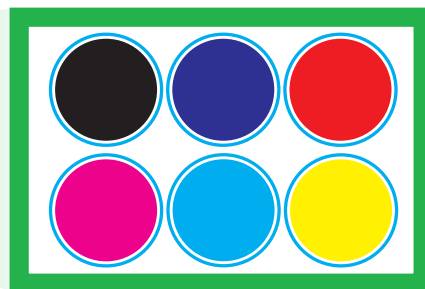


Label printing machine



Finding a print mark

The entire length of the repeat is displayed on the monitor using Autoscan Y in the repeat overview. The required position can be clicked using a mouse and the camera moved directly to this position.



Measuring a matrix

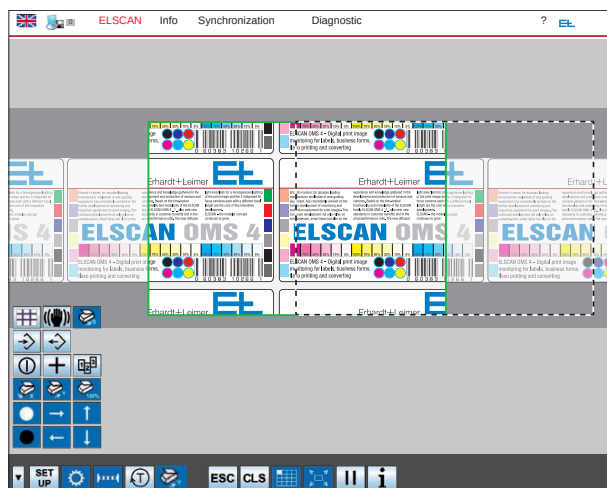
Two lines can be positioned horizontally and vertically on the repeat using a mouse and the related distances determined. This function is interesting for measuring labels or for monitoring a punch position in relation to a print position.

Autoscan Y

Function for scanning along the direction of travel of the web; the step size is adjusted to the current field of view in the monitor.

ELSCAN OMS 4112 can be expanded and can also be upgraded later with:

- + Motorized movement perpendicular to the web (ELSCAN OMS 4113)
- + Image position memory with master image - print image comparison (ELSCAN OMS 4114)
- + Color comparison of a repeat position with several panels (ELSCAN OMS 4115)
- + Color comparison at a repeat position (ELSCAN OMS 4116)
- + Color comparison at several repeat positions (ELSCAN OMS 4117)
- + Double camera system for monitoring front and back of web
- + Double camera system for monitoring print images and punched panels



ELSCAN OMS 4113

Digital motorized print image monitoring for the label, business form, flexo printing, converting sectors

Based on the proven digital ELSCAN web monitoring technology, ELSCAN OMS 4113 was developed specially for use in inaccessible applications or for larger web widths.

ELSCAN OMS 4113 is a highly compact, motorized web monitoring system, also for installations where there is little space. In contrast to ELSCAN OMS 4112, here a motorized cross-beam is used. The basic version of ELSCAN OMS 4112 can be upgraded to ELSCAN OMS 4113 at any time. The motorization is available with fastening on one side for the narrow web sector and also with fastening on both sides for larger installations.

Compared to OMS 4112, ELSCAN OMS 4113 provides additional customer advantages:

- + Continuous monitoring of the web perpendicular to the direction of web travel (Autoscan X)
- + Standard 100 % scan to suit the repeat (Autoscan 100 %)
- + Quick retrieval of a stored reference point (Hot Spot), e.g. a print mark, using a key
- + It is possible to save any position in the repeat with a master image. The size and position of the master image are defined using the mouse.

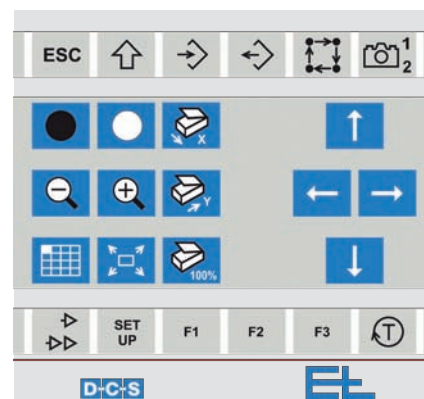
- + The master position can be opened again, the camera moves to this position and displays the master image for comparison.

ELSCAN OMS 4113 can be expanded and can also be upgraded later with:

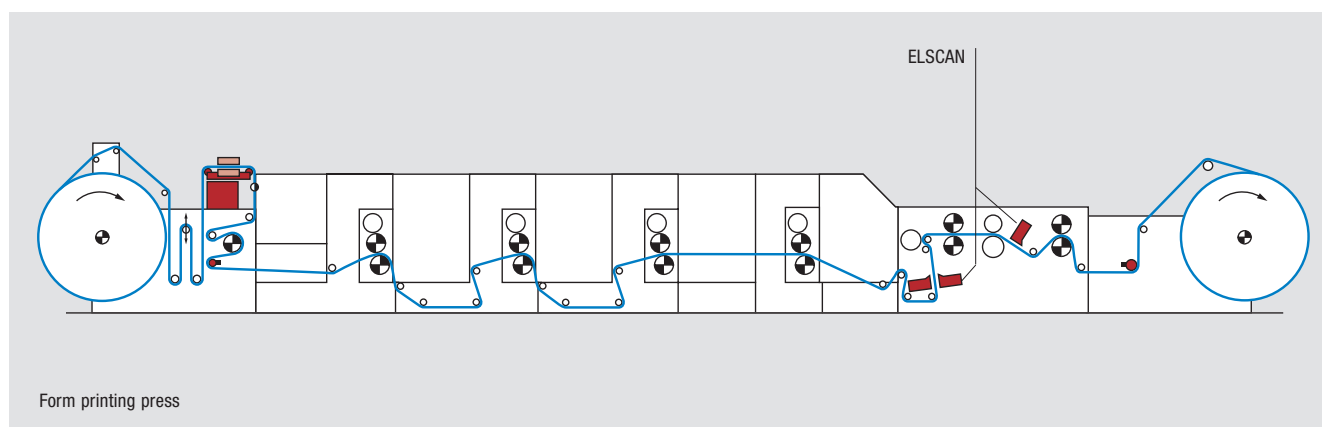
- + Image position memory with master image - print image comparison (ELSCAN OMS 4114)
- + Color comparison of a repeat position with several panels (ELSCAN OMS 4115)
- + Color comparison at a repeat position (ELSCAN OMS 4116)
- + Color comparison at several repeat positions (ELSCAN OMS 4117)
- + Double camera system for monitoring front and back of web
- + Double camera system for monitoring print images and punched panels



ELSCAN OMS 4113



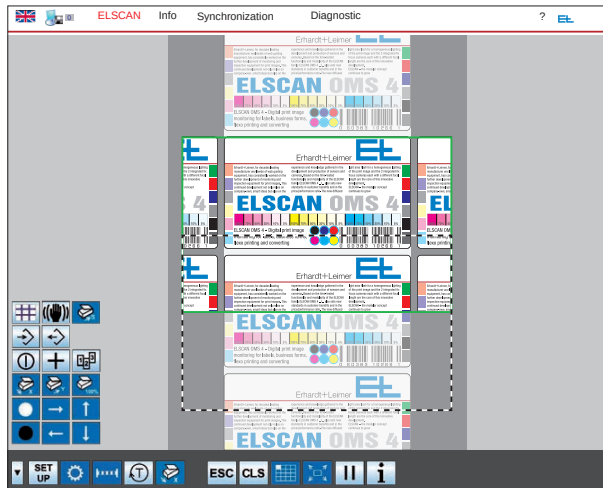
Keypad for ELSCAN OMS 4113



Autoscan X

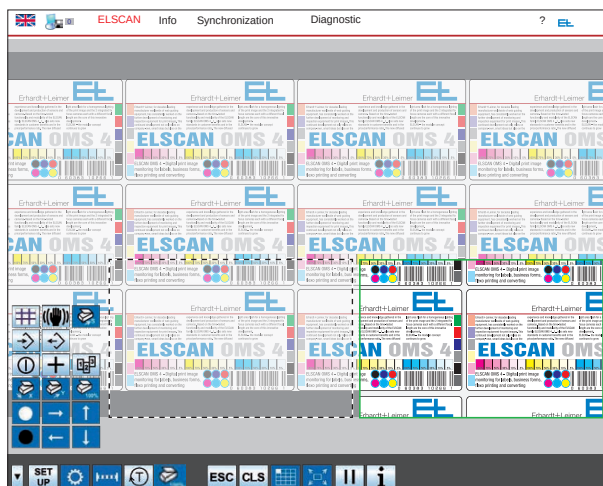
In the Autoscan X mode the web is scanned perpendicular to the direction of web travel. The web width to be monitored can be selected as required.

With this function, ELSCAN OMS 4113 automatically calculates the number of necessary steps to suit the section of the image selected. If necessary, the entire scan can be displayed on the monitor. The related function is displayed on the monitor on the toolbar.



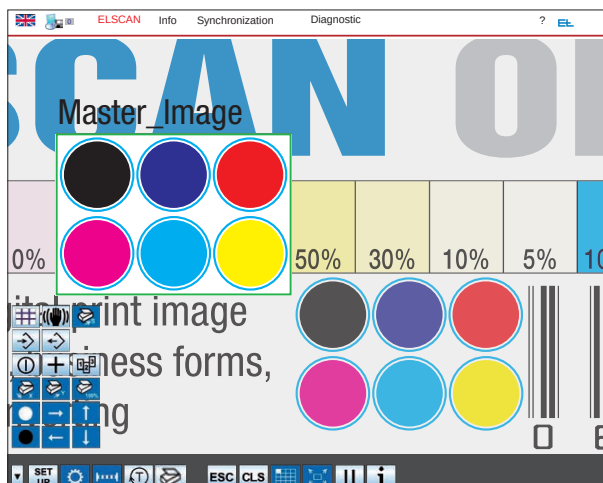
Autoscan 100%

In Autoscan 100% the web is scanned along and perpendicular to the direction of web travel. With this function, ELSCAN OMS4113 automatically calculates the number of necessary steps to suit the section of the image selected. If necessary, the entire repeat can be displayed on the monitor. The related function is displayed on the monitor on the toolbar.



Hot Spot (reference point)

A reference point on the repeat can be saved with a master image and recalled later at the press of a key.



ELSCAN OMS 4114

Digital motorized print image monitoring system with expanded software functions

Based on the proven digital ELSCAN web monitoring technology, ELSCAN OMS 4114 was specially developed for monitoring wider webs.

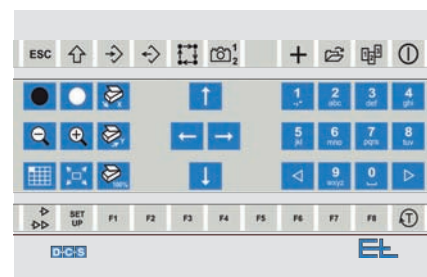
ELSCAN OMS 4114 provides based on ELSCAN OMS 4113 expanded software functions with a separate, expanded keyboard. ELSCAN OMS 4114 is used for working effectively with the web monitoring system.

Compared to ELSCAN OMS 4113, ELSCAN OMS 4114 provides important customer advantages:

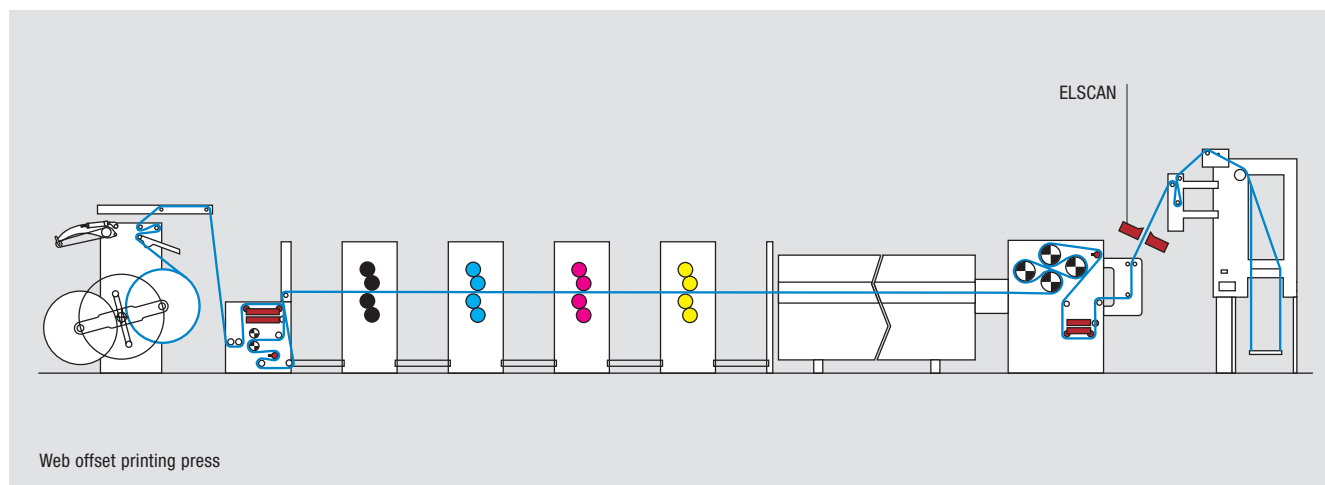
- + Image position overview with up to 20 individually programmable image positions and the related reference images is opened or closed again
- + The actual camera position is saved with the related settings (field of view, brightness, etc.) and opened
- + It is possible to move to the required image position at the press of a key or by double-clicking using the mouse
- + The image positions from the image position overview are moved to automatically in an endless loop.
- + The actual job can be saved with a name and also opened again later for repeat jobs using the image position overview
- + The image position is not found directly on opening an old job, it is found automatically by scanning (typical for gearwheel sensor synchronization)



ELSCAN OMS 4114



Keypad for ELSCAN OMS 4114



Web offset printing press

ELSCAN OMS 4114 (software variant PRO)

Up to 20 image positions on the moving print image can be saved and opened again as a job with different camera settings. The image position is saved together with the individual camera parameters at the simple press of a button.

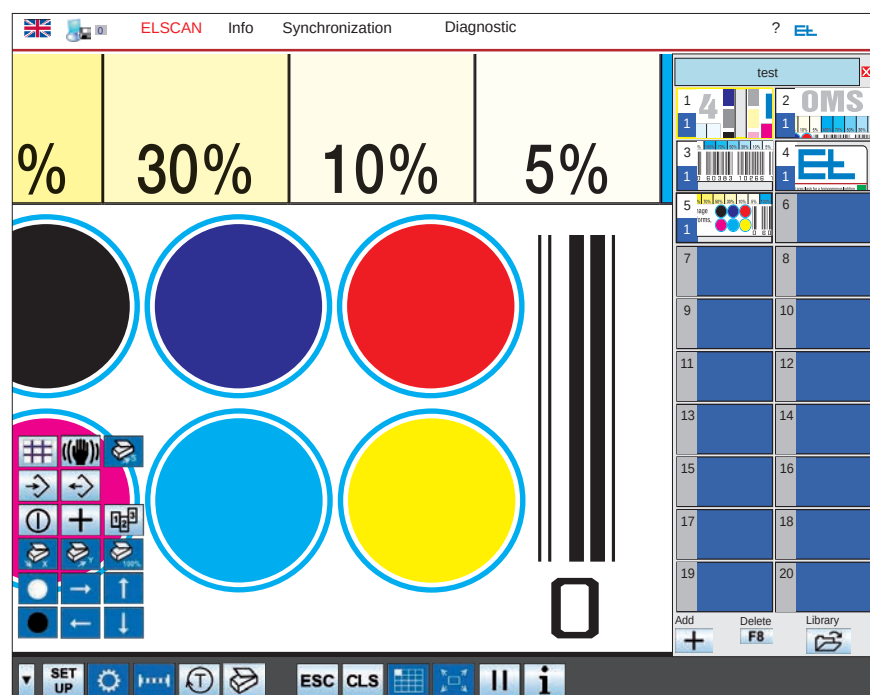
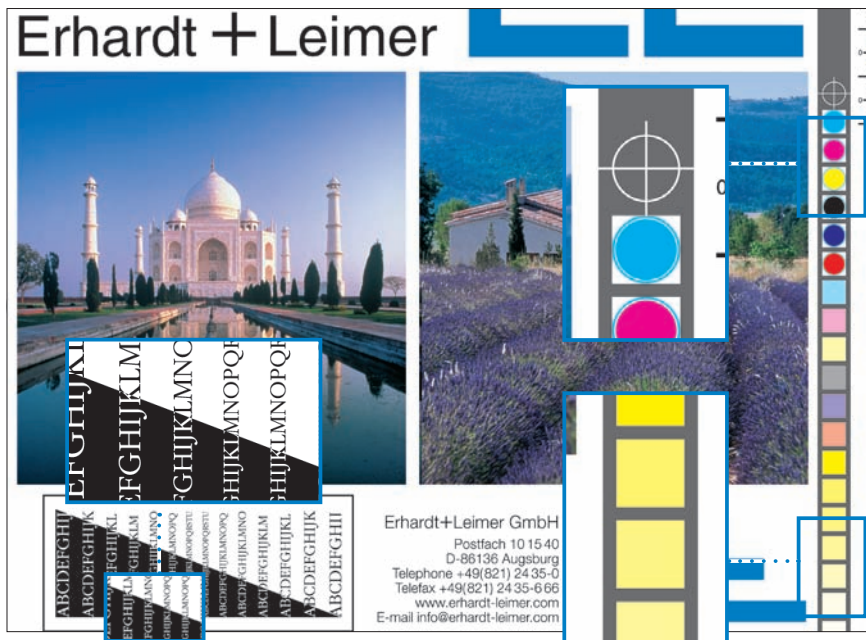


Image position gallery

Overview of the individually saved image positions in the current job so they can be opened again easily.

ELSCAN OMS 4114 can be expanded and can also be upgraded later with:

- + Color comparison of a repeat position with several panels (ELSCAN OMS 4115)
- + Color comparison at a repeat position (ELSCAN OMS 4116)
- + Color comparison at several repeat positions (ELSCAN OMS 4117)
- + Double camera system for monitoring front and back of web
- + Double camera system for monitoring print images and punched panels on the front side

ELSCAN OMS 4115 / OMS 4116 / OMS 4117

Digital print image monitoring with advance software functions – color comparison

Based on the proven digital ELSCAN web monitoring technology, ELSCAN PLUS was developed for the inspection of homogeneous colored areas, e.g. logos, marks, etc. in the label, form, and packaging printing sector.

The software version PLUS provides a color comparison at a repeat position. The software version Pro PLUS is a combination of the software versions Pro and PLUS. This software version makes it possible to compare the color of a panel (master) with other panels in the repeat. A prerequisite for a reliable color comparison is the good, even and reproducible image quality of the camera system and correspondingly high quality image processing.

In the case of the software version ELSCAN PLUS the image data from the master image are initially analyzed and segmented by areas with the same color and same color intensity. During the production run, the actual production is compared with the master analyzed in relation to the size of the colored area, the color and the color intensity.

The sensitivity for the segmented colored areas can be set individually in accordance with CIE Lab criteria, Delta E, and also excluded from the color comparison. If the tolerance set is exceeded (Delta E), a corresponding message is displayed on the monitor. Using the actual deviation based on Lab, the

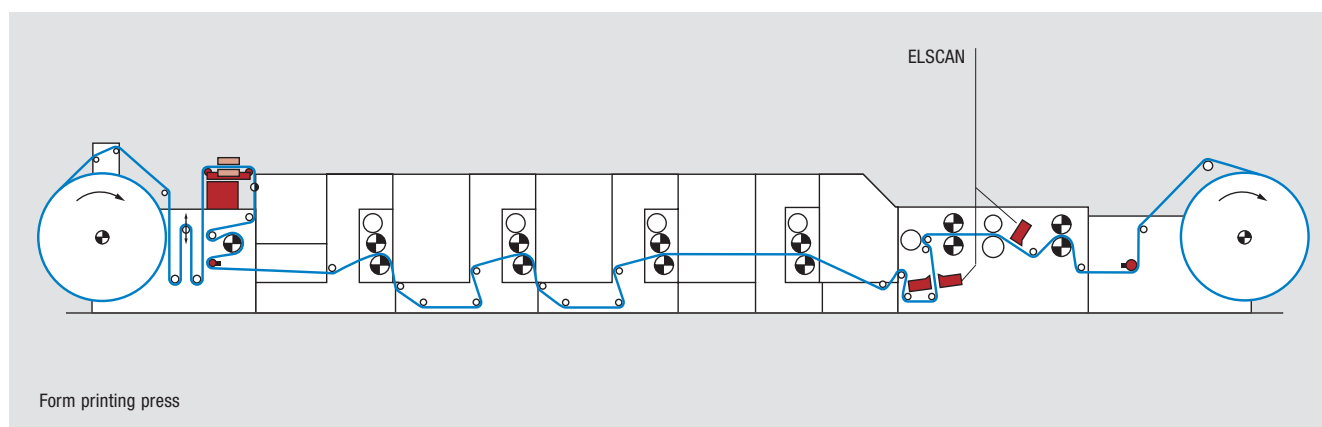
press operator can react directly and, e.g. supply more or less color to the printing process. This tolerance variation can also be signaled using an additional digital output.

ELSCAN OMS 4_15 / OMS 4_16 / OMS 4_17 provides important customer advantages:

- + The software version PLUS (color comparison) can be upgraded at any time.
- + The standard functions and the operation of the web monitoring system are retained
- + The color comparison can be disabled at any time, and re-enabled again using the analysis data saved
- + Master position in the repeat is defined using the mouse
- + Then the master image is analyzed for color, color density and colored area at the press of a button
- + The individual colored areas can be evaluated with different tolerances or their selection cleared
- + The master image can be placed beside the actual image for visual comparison
- + Continuous comparison of the ongoing production with the master reference and indicated in the case of variations in Delta E and Lab
- + The actual measurements are displayed graphically and permit direct assessment of the product quality. The number of images analyzed in relation to the number of defective images is also shown in the statistics
- + The software version OMS_16 color comparison is also suitable for monitoring the register settings
- + Software version OMS_15: Continuous comparison of the ongoing production with the master taught-in with several identical panels in the repeat
- + Software version OMS_17: Teach-in and analysis of several master positions in the repeat
- + Continuous comparison of the ongoing production with the masters taught-in and indication in case of variation in Delta E and Lab
- + Optional digital alarm output
- + Other software versions are in preparation

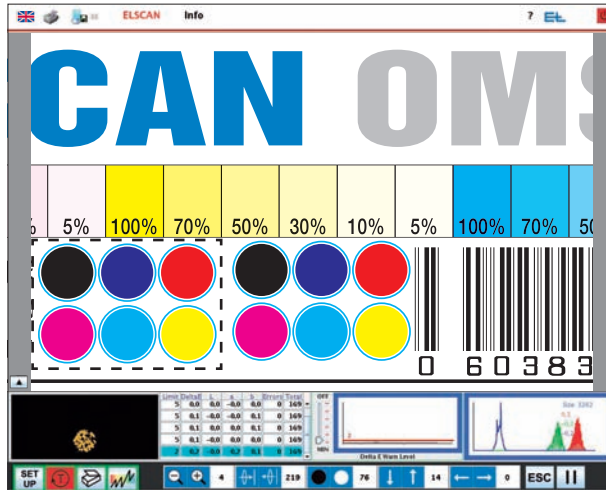
ELSCAN OMS 411_ can be expanded and can also be upgraded later with:

- + Double camera system for monitoring front and back of web
- + Double camera system for monitoring print images and punched panels on the front side



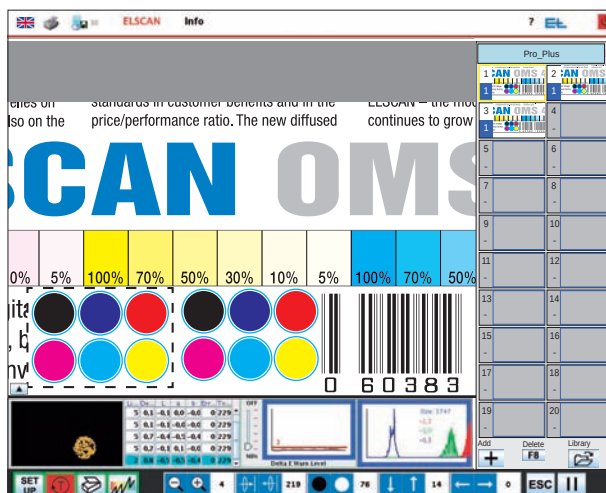
PLUS version

The software expansion ELSCAN OMS4 PLUS makes it possible to inspect the color at a position. First the area to be checked is defined by the user, then it is analyzed by the software. Individual tolerances can be assigned to each color; if the tolerances are exceeded during ongoing production, an alarm is triggered. This functionality is of particular interest in label and form printing and has already been proven in practice.



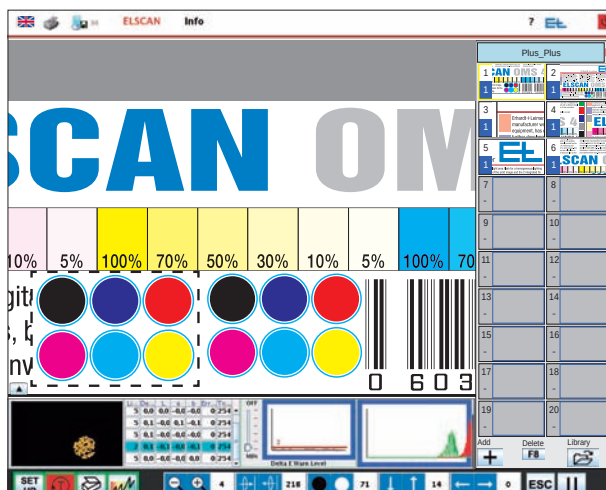
PRO PLUS version

The software version Pro PLUS is a combination of the software versions Pro and PLUS. 20 different image positions with individual settings such as zoom or brightness can be saved in the image position gallery. The color inspection relates to a position and can be used with several panels.



PLUS + version

Unlike the versions PLUS and Pro PLUS, in the software version PLUS + several image positions can be defined, analyzed and compared in relation to color, color density and color intensity. In the image position overview, the image positions with inspection are marked accordingly.



ELSCAN OMS 421_

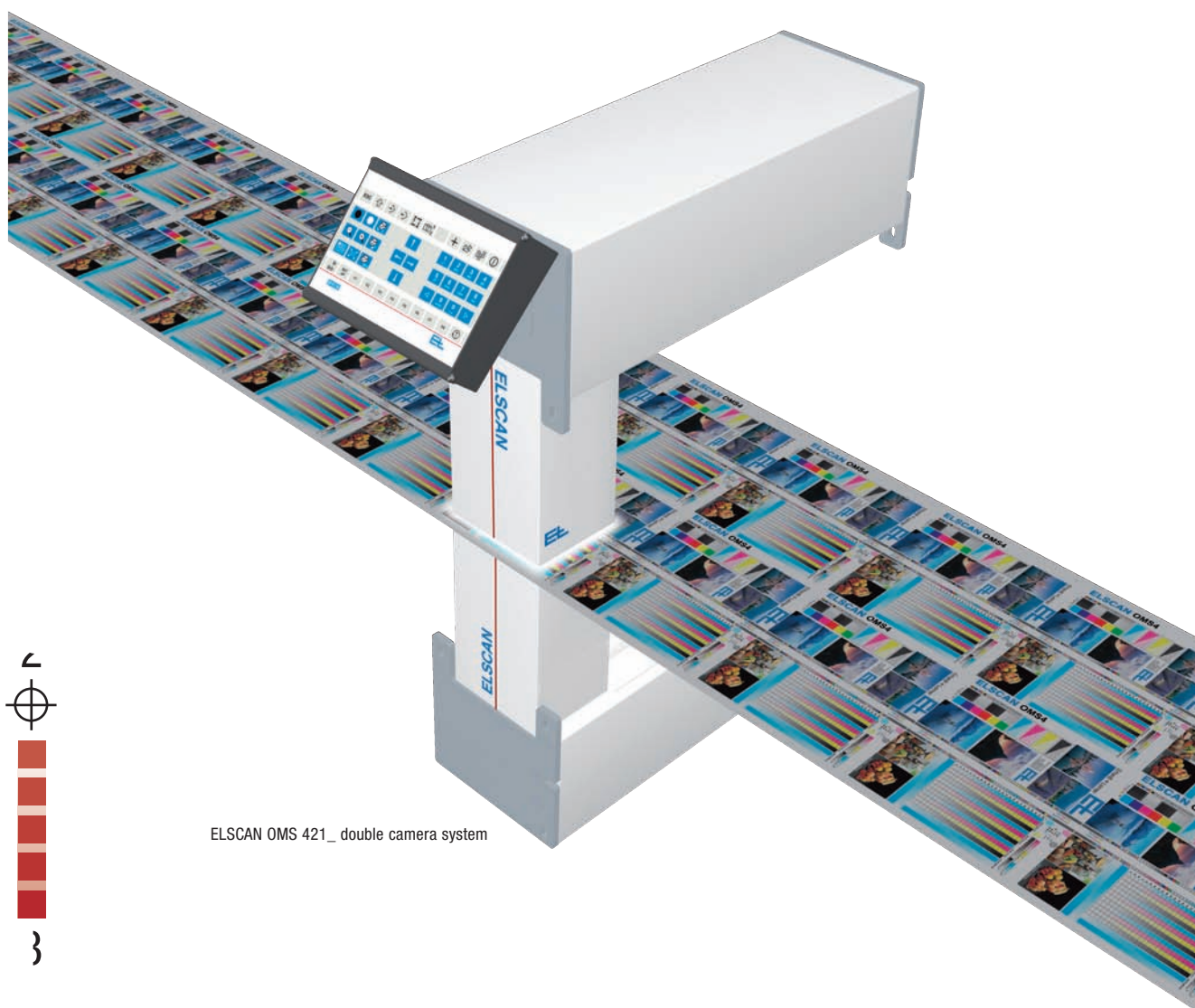
Digital double camera print image monitoring system

Based on the proven digital ELSCAN web monitoring technology, ELSCAN OMS 421_ was developed for monitoring the front and back of printed webs.

ELSCAN OMS 421_ is a highly compact double camera system based on the ELSCAN web monitoring system. It can be straightforwardly integrated into existing production lines without major modifications with full functionality of the individual ELSCAN OMS versions, also in the label sector. The two cameras can be operated and positioned independently in relation to the web or they can be operated in the synchronized master-slave mode.

ELSCAN OMS 421_ is available in a manual and also in a motorized version. The software versions Pro and Plus are also available for these double camera systems.

With the front and back web monitoring according to register option, a complete, pre-assembled, calibrated unit is supplied by E+L. With this option high accuracies can be monitored on the front/back register.



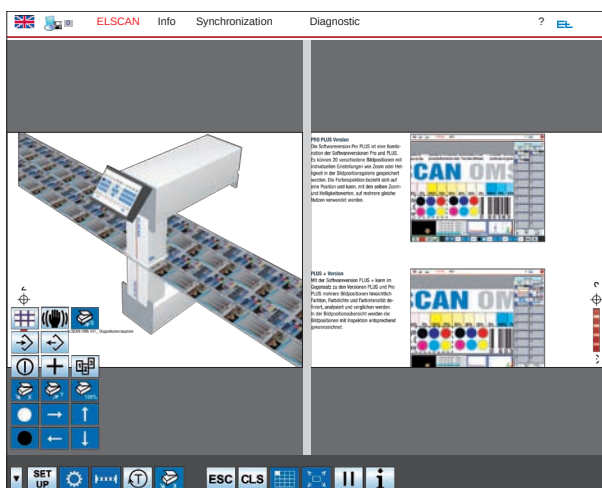
ELSCAN OMS 421_ double camera system



Using ELSCAN OMS 421_ the following camera image display modes can be selected:

Complete image mode

In the complete image mode, the images from the selected camera are displayed in full size on the monitor (standard).



Split screen mode

In the split screen mode the images from the two cameras are displayed simultaneously side by side on the monitor. The section of the image and position can be different. The advantage is the double image information.



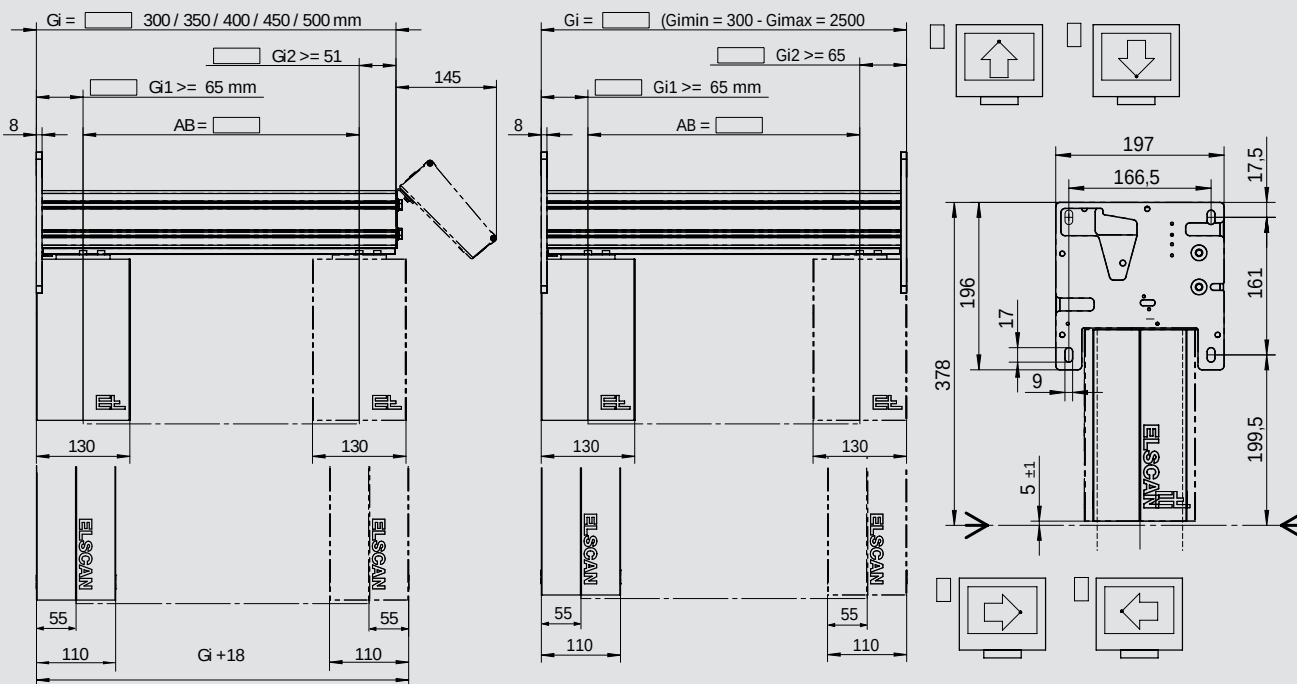
Accurate front and back web monitoring according to register

Semi-transparent superimposed image display (image from the slave camera is mirrored). With this variant the front and back of a web can be monitored for accuracy of register following an optical calibration process. This monitoring can be displayed in the split screen mode and in the superimposed semi-transparent complete image mode. For this purpose the image from the slave camera is mirrored and superimposed, semi-transparent, over the image from the master camera with exact synchronisation.

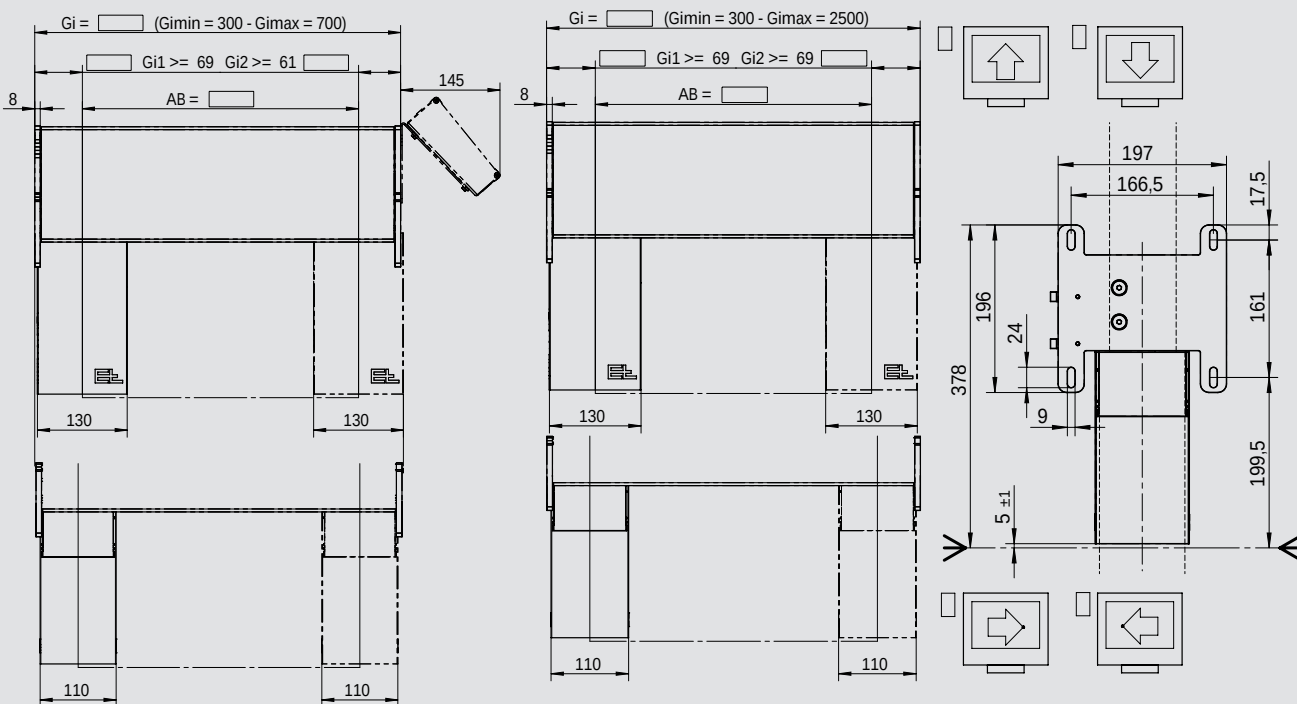


ELSCAN – Dimensions

manual version:



motorized version:





ELSCAN Enquiry form

We would be pleased to send you a quotation without any obligation on your part.
 Fax us this form duly completed – we will contact you without delay.

General data

Interested party/company, sector		Contact
Postcode	City/town	Country
Tel.	Fax	E-Mail

Printing press / type:

Technical data

Type of web:	☐ Paper	☐ Cardboard	☐ Film	☐ Transparent film	☐ Other
Printing system:	☐ Label printing	☐ Offset	☐ Screen printing	☐ Flexo printing	☐ Gravure printing ☐ Other
Max. web speed (m/min.): _____					
Max. ambient temperature (°C): _____ ☐ Comments potentially explosive atmosphere					

	Camera 1	Camera 2 (Double camera system)
Field of view	☐ 120x90 mm	☐ 120x90 mm
Camera system	☐ manual ☐ motorized ☐ PRO ☐ PLUS	☐ manual ☐ motorized
Image movement on the monitor	☐ horizontal ☐ vertical	☐ horizontal ☐ vertical
Computer – camera	Cable length (m): _____	Cable length (m): _____
Crossbeam¹	Installation dimension in mm (camera 1) Gi ¹ _____ mm AB ¹ _____ mm	Installation dimension in mm (camera 2) Gi ¹ _____ mm AB ¹ _____ mm
Fastening	☐ one side ☐ two sides	☐ one side ☐ two sides
Additional flash	☐ Flash 1 ☐ Flash 2 ☐ UV Flash ☐ Backside Flash ☐ Flash 3 ☐ Flash 4 ☐ UV Flash	
Control panel	☐ on the crossbeam ☐ installation kit ☐ in the housing	2. Control panel ☐ Installation kit ☐ in the housing
Computer-control panel	cable length (m): _____ ☐ 2 m ☐ 7 m ☐ other _____ m	cable length (m): _____ ☐ standard 2 m ☐ 7 m ☐ other _____ m
Monitor	☐ E+L ☐ Customer ☐ 19 Zoll	2. Monitor ☐ E+L ☐ Customer ☐ 19 Zoll
Computer – Monitor	cable length (m): _____ (standard 1,5 m)	cable length (m): _____ (standard 1,5 m)
Synchronization	☐ Gearwheel sensor ☐ Encoder ☐ Print mark sensor ☐ digital	☐ Optocoupler ☐ Attachments ² ☐ RS 422
Computer – Sync	cable length (m): _____	
Other	_____	

¹ see dimensions, page 16, ² see dimensions, page 17 at bottom



ELSCAN – technical data

Fully digital dual fixed focus color video camera

- + Image resolution: 2 x 5 million pixels
- + Digital zoom (corresponds to 12-times optical zoom)
- + Large field of view range: min. 4 x 3mm, max. 120 x 90 mm
- + New diffuse area flash for even illumination of reflective, metalized printing, also suitable for monitoring paint.
- + LCD shutter for high production speeds
- + Digitized aperture function
- + For different direction of web travel on the monitor, the camera can be rotated by 90°
- + Adaptation of the direction of travel of the web on the monitor by 180° in software
- + As standard image can be mirrored around the X and Y axis
- + Automatic white balance
- + Status indication for the communication and synchronization on the monitor
- + Highly dynamic brushless drive for the crossbeam
- + Preparation for double camera system as standard
- + Communication with dedicated industrial Pixellink
- + Camera can be installed in any position
- + Durable polycarbonate housing

Special features of the software

- + As standard, operation using the mouse
- + Indication of actual position in the repeat
- + Indication of actual camera values in the toolbar
- + Indication of actual status
- + Language switching as standard
- + Pop-up help for every adjustment function and heading
- + Convenient direct help integrated into the system
- + User setup
- + Installation setup
- + Service menu
- + Remote control possible
- + Direct indication of the synchronization signals on the monitor
- + Modular upgrade path for all software versions as well as Pro, Plus, Pro Plus, Plus + (license activation)
- + Upgrade with front-rear register on double camera systems possible
- + Other versions in preparation

Technical data, computer

Power supply	100 to 240 V AC/400 W (-10 %/+10 %)
Rated frequency	50 to 60 Hz
Prozessorboard	AMD Athlon 64 x2 4000+
IDE Flash Memory	2 GB
Memory	2 GB
Operating system	LINUX
Interface	USB, DVI, VGA, Pixellink, Ethernet, PS2
Internal power supply	24 V DC/6,5 A/150 W
Ambient temperature	+5°C to +40°C (higher temperatures will cause the electronics to age prematurely)
Weight	6,6 kg
Protection class	IP 32 (30)
Filter on the air inlet	yes
Dimensions (L x W x H)	450 x 330 x 115 mm

Technical data, camera

Type	OM 41..
Zoom	2x CMOS chip
Resolution	2596x1944 (5MPixel)
Color system	Bayer Matrix
Field of view	min. 4 x 3 mm, max. 120 x 90 mm
Web speed	max. 800 m/min
Ambient temperature	+5°C bis +45°C
Weight	0,96 kg
Protection class	IP 42 (40)
Dimensions (L x W x H)	110 x 130 x 225 mm

Technical data, crossbeam with positioning motor

Power supply	internal
Positioning speed	max. 0,9 m/s
Positioning, torque and speed controlled brushless drive	

Technical data, monitor

Power supply	100 to 240 V AC/120 W (-10 %/+10 %)
Rated frequency	50 to 60 Hz
Resolution	1.280 x 1.024 Pixel
Connection	DVI
Size	19"
Weight	3,95 kg

Technical data, control panel

Dimensions (L x B x H, 25 keys)	109 x 109 mm	146 x 123 x 59 mm
Dimensions (L x B x H, 46 keys)	128,4 x 195 mm	206 x 123 x 59 mm

Installation kit

Housing

Subject to technical modification without notice



Head Office

Erhardt+Leimer GmbH

Albert-Leimer-Platz 1 · 86391 Stadtbergen · Germany

Postfach 10 15 40 · 86136 Augsburg · Germany

Tel.: +49(0)821/2435-0

info@erhardt-leimer.com · www.erhardt-leimer.com

Subsidiaries

E+L Elektroanlagen Augsburg, Germany · E+L CTE Augsburg, Germany

E+L Corrugated Bielefeld, Germany · E+L Bradford, England · E+L Mulhouse, France

E+L Stezzano, Italy · E+L Bucharest, Romania · E+L Burlington, Canada

E+L Duncan, S.C., USA · E+L Mexico D.F., Mexico · E+L Guarulhos-São Paulo, Brazil

E+L Ahmedabad, India · E+L Hangzhou, China · E+L Tao Yuan, Taiwan · E+L Ishikawa, Japan