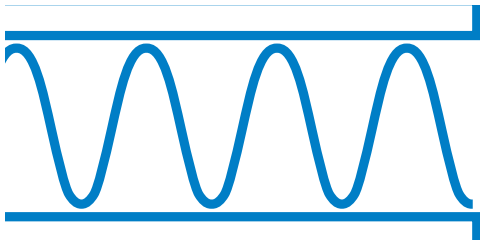
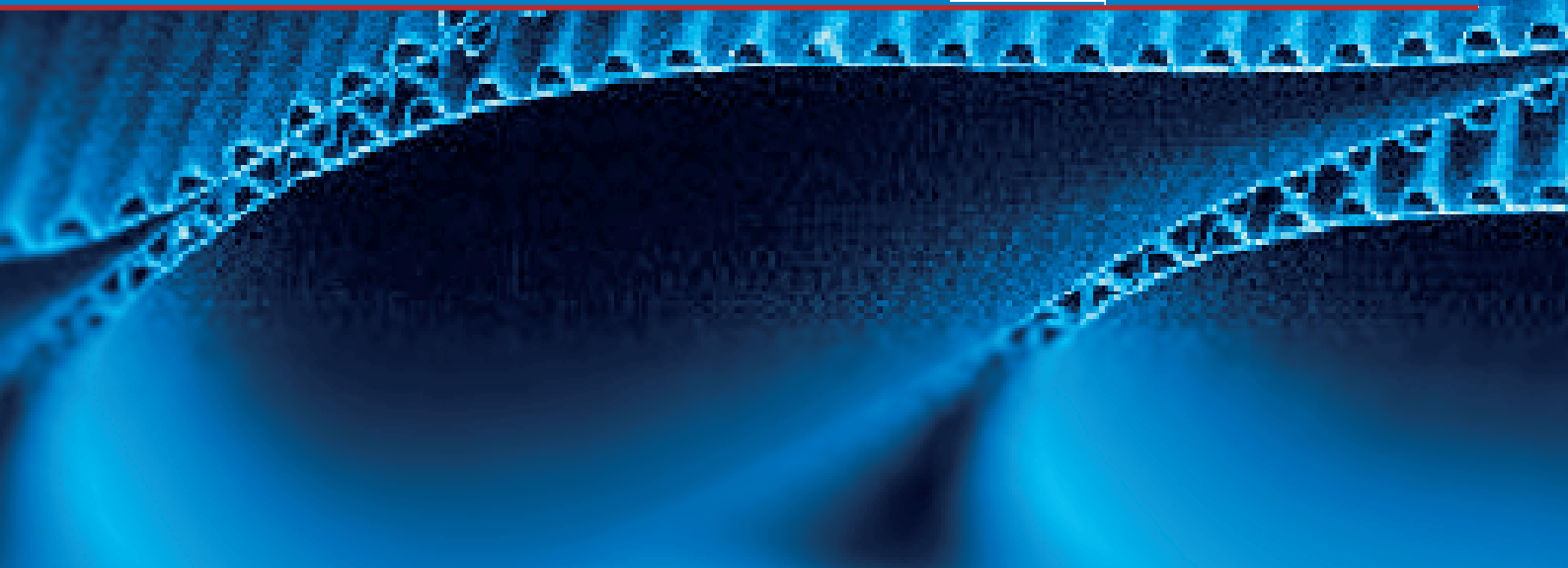
Corrugated



Corrugating industry

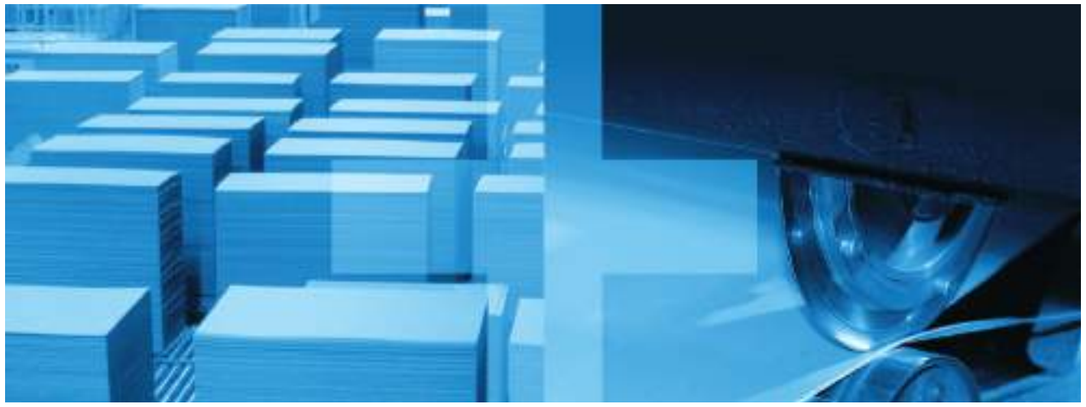
Leading technology on moving webs
Our solutions for the corrugating industry



E+L Corrugated. Your goal – our solutions

At E+L Corrugated we have a clear understanding of our customers' ultimate goal: Maximum profitability. Equally clear to E+L Corrugated is that your goal is heavily influenced by the key factors of minimum production costs and maximum product quality. It's for this reason that our portfolio of solutions are developed to help our customers to increase the efficiency of the corrugator and ensure that they produce the best possible corrugated board, ultimately increasing the productivity of your converting machines and ensuring optimum performance of the finished box.

Guiding and tension control | Process control | Quality assurance



Content

1

CorrAligner
bridge guiding system
Automatic alignment of single faced webs at the double backer lamination point

2

TensionMaster
bridge brake system
Automatic tension control of the single faced webs

3

ELCORR
compensating roller
Self-adjusting compensating roller to ensure equal heat transfer

4

ELTRAC single facer guiding system
Automatic guiding system for liner and medium papers

5

SplitWeb
web guiding system
Two narrow papers can be run as a full width web

6

Glue machine contact roller system
Maintenance-free system that ensures accurate glue application

7

TrimMaster slitter scorer guiding system
Automatic guiding of the slitter scorer in reference to the board

8

ELClean
dust removal system
Contactless cleaning of corrugated sheets

Process control systems

ELCorruMatic CCM
Corrugator Process Control System

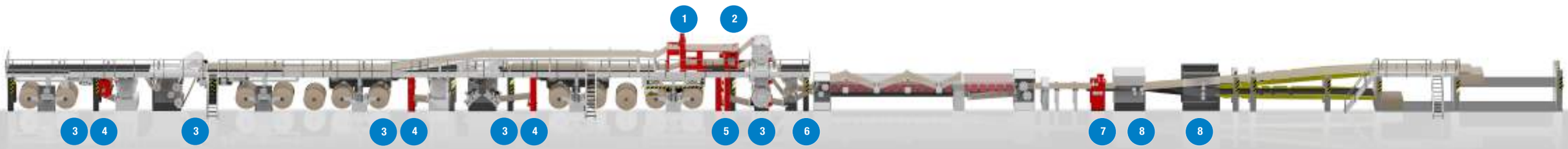
ELCorruMatic CSM
Corrugator Speed and Splice Management System

ELCorruMatic RSM
Corrugator Roll Stock Management System

Quality assurance systems

ELCorrVision-Pattern
Inspection of print to die cut registration during the conversion process

ELCorrVision-Scan
Cross cut to print registration during pre-print production



CorrAligner

The E+L CorrAligner bridge guide system is of fundamental importance in reducing waste associated with alignment of the single faced webs and outer liner at the double backer lamination point. The automatic functioning of the CorrAligner ensures that wet-end grade changes can be made without any operator input and without the need to reduce the line speed of the corrugator, contributing to maximum corrugator productivity and optimum board quality. In addition to drastically reducing waste associated with manual alignment during a wet-end grade change, accurate alignment of the single faced webs and outer liner also creates the correct condition to allow the slitter scorer to perform to it's minimum trim level, giving our customers to option to reduce trim waste or achieve greater deckle utilisation.
Of course, process continuity is also another factor of key importance. The E+L CorrAligner utilises a non-edge contact guiding system, removing the common issue of single faced web breaks and loss of machine productivity caused by the function of mechanical edge guides.

Technical data

Design (for single, double, triple level)	Compact (standard) for up to 350 g/m² Heavy duty for more than 350 g/m² Retrofit as replacement for a CorrAligner of a previous generation
Working width	Min. 500 mm – max. 3300 mm (depending upon machine specification)
Web speed	Up to 500 m/min
Required compressed air supply	6 bar, oil free air
Ambient temperature	10 °C – 50 °C (non-condensing)
Power supply	380 – 480 V AC, 3 Ph, Pe
Frequency	50/60 Hz
Power consumption	2 kW
Guiding accuracy (at the next roller directly after the CorrAligner)	+/- 3 mm, optional +/- 1 mm

Benefits

+ Reduced waste during a wet-end grade change
+ Reduced trim / maximum width utilisation
+ Increased corrugator and conversion productivity
+ Increased board quality

TensionMaster

The importance of producing flat sheets in the corrugating process cannot be overstated. The E+L TensionMaster ensures that the single faced webs are correctly tensioned at the double backer lamination point resulting in flat 'machine direction' sheets. The TensionMaster closed loop control system ensures that the correct tension value is maintained even when process conditions change. Furthermore, the closed loop system allows for proven tension values to be used for future orders by manual input or by downloading from customers planning systems. The TensionMaster can be configured with a pneumatic brake or a servo drive to ensure that various process and product factors, which create too much natural tension, do not impact the quality of the finished board.

Technical data

Design (for single, double, triple level)	Pneumatic brake Servo brake
Working width	Min. 500 mm – max. 3300 mm (depending upon machine specification)
Web speed	Up to 500 m/min
Required compressed air supply	6 bar, oil free air
Ambient temperature	10 °C – 50 °C (non-condensing)
Power supply	380 – 480 V AC, 3 Ph, Pe
Frequency	50/60 Hz
Power consumption	Pneumatic controlled: 2 kW Servo-controlled: 7.5 kW / Level
Braking force	Up to 200 dN (depending upon type)

Benefits

+ Increased productivity
+ Consistent product quality
+ Low maintenance solution

ELCORR

S-warp is a common issue for all producers of corrugated board regardless of the age or sophistication of machine that they use. This is because the problem of S-warp is a direct result of differing paper thicknesss, which is seen as a slack edge in the paper. This slack edge results in unequal contact at the pre-heating and pre-conditioning cylinder which causes a temperature variation across the web, which is the cause of S-warp. The ELCORR compensating roller eradicates S-warp by ensuring that equal heat transfer occurs at the pre-heating and pre-conditioning cylinders. Its self-adjusting mechanism is driven by the paper tension and automatically compensates for differences in cross tension within the paper.

Technical data

Roller stroke	+/- 10 mm
Working width	Min. 500 mm – max. 3300 mm
Ambient temperature	10 °C – 70 °C
Web tension	2000 N at 30° wrap angle 1500 N at 30° – 90° wrap angle 1000 N at 90° – 120° wrap angle

Benefits

+ Increased productivity
+ Improved box performance
+ Maintenance free

ELTRAC

The ELTRAC single facer guiding system fully automates the paper alignment process in the single facer. Guiding of the medium paper allows the operator to set the glue dams at the edge of the paper, ensuring full width gluing, without running the risk of glue transfer to the corrugating rolls. The liner paper is then guided to the position of the medium paper, ensuring accurate alignment of the papers in the single faced web. In addition to creating the correct conditions for minimum trim at the slitter scorer, automation of alignment processes in the single facer allows the operator to concentrate on the numerous key functions required to produce the single faced web.

Technical data

Working width	Min. 400 mm – max. 3300 mm (depending upon machine specification)
Web speed	Up to 600 m/min
Required compressed air supply	6 bar, oil free air
Ambient temperature	10 °C – 50 °C (non-condensing)
Power supply	380 – 480 V AC, 3 Ph, Pe
Frequency	50/60 Hz
Power consumption	2 kW
Guiding accuracy (at the next roller directly after the ELTRAC)	+/- 3 mm, optional +/- 1 mm
Correction area	Up to +/- 50 mm (depending on working width)

Benefits

+ Reduced trim / maximum width utilisation
+ Prevention of glue transfer to corrugator rolls
+ Full width glue application

SplitWeb

The SplitWeb web guiding system allows customers to take advantage of the low cost narrow reels sold by paper producers. Using two guiding frames, the SplitWeb system guides two narrow reels together to form a full width paper. In addition to giving customers the possibility to save paper costs, the SplitWeb system also gives customers the possibility to run two different pre-print orders at the same time, resulting in an obvious increase in corrugator productivity. The functionality of the SplitWeb system can be used for any paper in the corrugator. Furthermore, when a standard full width paper is being run, the SplitWeb system functions as an ELTRAC guiding system and guides either the liner, medium paper or outer liner to the correct lateral position.

Technical data

Working width	500 – 1900 mm 800 – 2200 mm 1100 – 2500 mm 1400 – 2800 mm
Web speed	Up to 600 m/min
Required compressed air supply	6 bar, oil free air
Ambient temperature	10 °C – 50 °C (non-condensing)
Power supply	380 – 480 V AC, 3 Ph, Pe
Frequency	50/60 Hz
Power consumption	2 kW
Guiding accuracy (at the next roller directly after the SplitWeb)	+/- 1 mm
Correction area	+/- 50 mm

Benefits

+ Paper cost savings
+ Increased corrugator productivity
+ ELTRAC function for standard production

Glue machine contact roller system

The E+L glue machine contact roller system is a self-adjusting system to ensure that the board gap in the glue machine is correct, regardless of the type of medium being run. In addition to removing the problem of caliper reduction, which can be caused by traditional rider roll type systems, the glue machine contact roller system also ensures the glue application is made to the correct position on the flute tip. Although correct glue application is of fundamental importance for all flutes sizes, this parameter is even more critical in micro-flute production. Furthermore, in addition to being a fully automated system, the glue machine contact roller system does not require the maintanence associated with systems that use a spring shoe configuration.

Technical data

Working width	Min. 400 mm – max. 3300 mm (other width on request)
Compressed air	6 bar
Further data	Project-specific

Benefits

+ Reduced glue costs
+ Increased board quality
+ Reduced energy consumption
+ Maintenance free

TrimMaster

The TrimMaster allows your slitter scorer to achieve the minimum side trim specified by the OEM. This is achieved by constantly guiding the slitter scorer to the position of the oscillating board. The integrated web stabilisation system then prevents further lateral movement of the board induced by the slitter scorer as it follows the board. The TrimMaster enables you to plan orders with minimum side trim. Another major benefit is by ensuring that waste, caused by operating the rotary shear and often referred to as 'tail-out waste', no longer occurs. In the case of pre-print production, the pre-printed guiding line is automatically detected. The TrimMaster then ensures that the slit to print registration is achieved, preventing the costly waste associated with pre-print production.

Technical data

Working Width [mm]	500 – 1.900 800 – 2.200 1.100 – 2.500 1.400 – 2.800
Machine speed	Up to 500 m/min
Required compressed air supply	6 bar, oil free air
Ambient temperature	10°C – 50°C (non-condensing)
Power supply	380 – 420 AC 3Ph, Pe
Frequency	50/60 Hz
Power consumption	2 kW with analog output 7,5 kW with electric cylinder (per cylinder)
Guiding accuracy (of the slitter scorer positioning)	+/- 0,5 mm
Correction area	Machine-dependent (stroke of the electric cylinder max +/- 80 mm)

Benefits

+ Reduced trim / maximum width utilisation
+ Reduced waste caused by rotary shear operation
+ Reduced pre-print waste

ELClean

Post-print quality is highly reliant on the corrugated sheets being free from dust, and with the ever increasing focus on brand awareness, customers are constantly increasing their quality related demands. The Elclean dust removal system is a non-contact cleaning system which ensures that the board leaving the corrugator is free from dust. Positioned before the cross cut, the slimline cleaning heads remove the dust created during the various stages of the corrugating process. The ELclean dust removal system uses an antistatic process to collect the dust particles following which, the high power vacuum heads suction the dust particles off of the running board. The heads are automatically positioned to ensure that the optimum distance is achieved for each differing board caliper. To meet the demand to supply customers with as much automation as possible, automatic changing of the dust filters is available as option.

Technical data

Working width	2200 mm 2500 mm 2800 mm 3300 mm	
Ambient temperature	10 °C – 50 °C	
Filter unit	One cleaning head	Two cleaning heads
Measurements	2.680/950/950 mm	2.680/950/950 mm
Nominal current	8.1 A	(2 x) 8.1 A
Air volume (at engine)	3000 m³/h	(2 x) 3000 m³/h
Voltage	380 – 480 V AC	380 – 480 V AC
Frequency	50/60 Hz	50/60 Hz
Energy consumption	4.0 kW	(2 x) 4.0 kW

Benefits

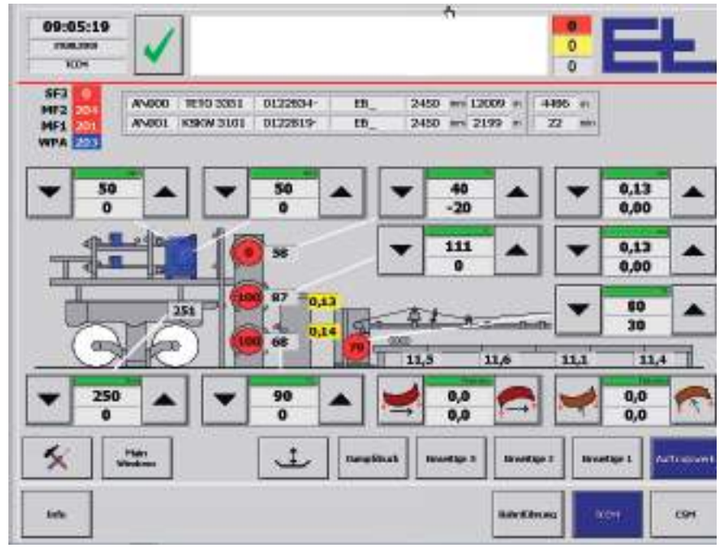
+ Increased post print quality
+ Cleaner production facility
+ Reduction of cleaning and maintenance

ELCorruMatic – Process Control System

A conventional corrugator is highly reliant on the performance of your operators and thus the business performance is highly reliant on the operators. In order to achieve your key goals of optimum corrugator and conversion productivity and increased box performance, the influence of the operator must be removed from the corrugating process. The operators play an extremely important role, but in the quest to produce the highest quality board as efficiently as possible, we must restrict operators input as much as possible and rely on automation to deliver the results you strive to achieve.
For this reason, E+L Corrugated developed the ELCorruMatic Process Control product range, enabling us to offer our customers a range of automation systems. The ELCorruMatic Process Control is made up of three sub-systems, all of which are modular in design, allowing installations to be made over a period of time.

ELCorruMatic CCM

The ELCorruMatic CCM Module (Corrugator Control Module) ensures maximum conversion productivity, optimum finished box performance and minimum production cost of corrugated board. The CCM controls the corrugating process in reference to the paper being run by managing the various settings and parameters that operators currently try to control. Automation of the numerous controls in the corrugating process results in a much faster reaction to property changes of the papers, helping to ensure that the quality of the board is as high as possible and consistent. Integration of the ELCorruMatic Warp Meter within the dry end allows operators to ensure that the sheets leaving the corrugator arrive at the conversion process with the correct profile to ensure optimum conversion productivity. Automation of the corrugating process also creates the correct condition for reducing the cost of production. Corrugated producers constantly strive to apply the minimal glue film to achieve the correct bonding performance, but as with any manual adjustment, the lack of control makes this impossible to achieve and the result is that the operators add additional glue which then requires additional energy to cure the glue. The CCM System ensures minimum glue application, which in addition to reducing the cost of starch, also reduces energy costs associated with removing excess moisture.

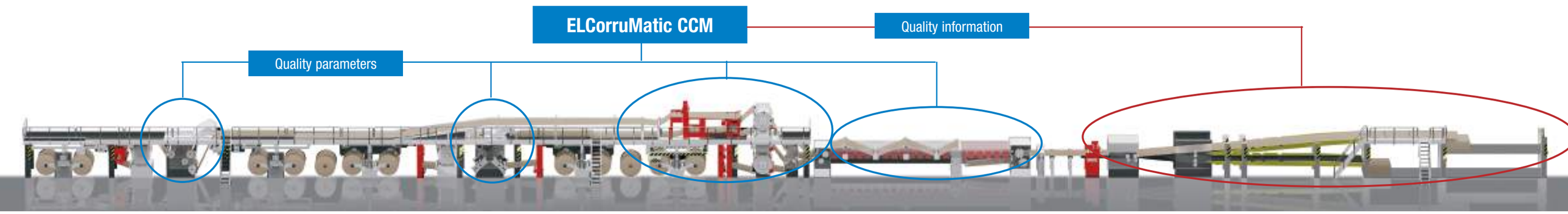


Technical data

Connected value	2.5 kW
Nominal current	2 A
Control voltage	24 V DC
Ambient temperature	10 °C – 50 °C (non-condensing)
Power supply	380 – 480 V AC, 3 Ph, PE
Frequency	50/60 Hz

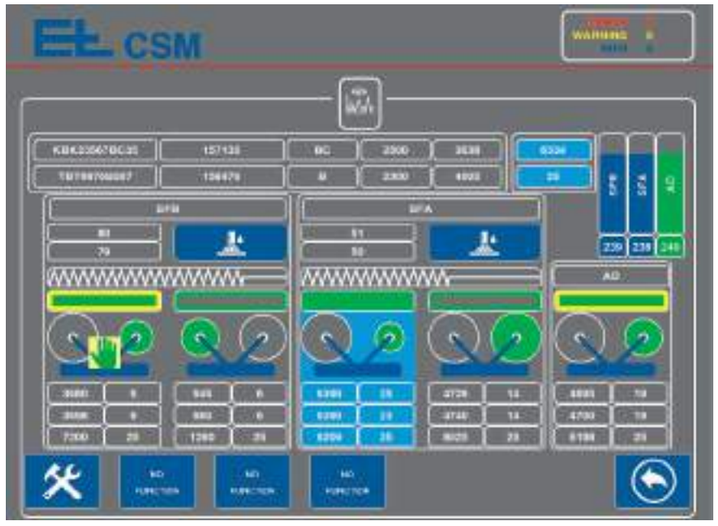
Benefits

+ Increased corrugator productivity
+ Increased conversion productivity
+ Increased finished box performance



ELCorruMatic CSM

The ELCorruMatic CSM Module (Corrugator Speed and Splice Management) contributes to optimum corrugator productivity by ensuring that the double backer speed is as high as possible for the product being run. In the case of a splice being required, the CSM system automatically controls the single facer speeds and the bridge volume to ensure that the double backer speed is kept constant, even when the wet-end speed is reduced for a splice. In addition to increasing the productivity of the corrugator, the CSM system also creates the correct condition for consistent, high quality board production as a result of constant heat input from the double backer, due to the constant speed of the main drive. A further contributor to increased corrugator productivity is a result of the CSM system splice management function. The CSM system negates the need to over-produce order lengths to ensure that adequate product has been produced. Due to the constant measurement of produced product, the CSM system will initiate all splicers when the exact order length has been produced and allow the sheet containing the various spliced papers to removed from the process.



Technical data

Connected value	2.5 kW
Nominal current	2 A
Control voltage	24 V DC
Ambient temperature	10 °C – 50 °C (non-condensing)
Power supply	380 – 480 V AC, 3 Ph, PE
Frequency	50/60 Hz

Benefits

+ Increased corrugator productivity
+ Improved paper material control

ELCorruMatic RSM

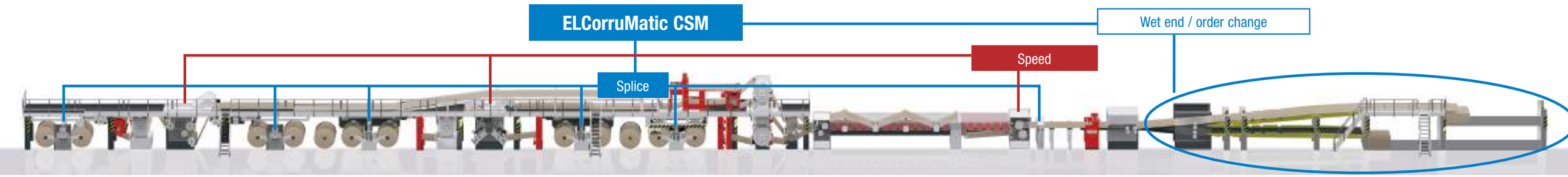
The ELCorruMatic RSM (Roll Stock Management) records the amount of lineal meterage used for any given order, allowing customers to analyse the amount of material required to fulfil the order and any wastage which occurred during production. The RSM system also provides full data about the remaining lineal meterage on any part used reel, providing customers with accurate statistics to help manage their paper stock inventory. As with any system within the ELCorruMatic product range, the RSM system can be used as a standalone system or integrated into any of the ELCorruMatic systems.

Technical data

Connected value	2.5 kW
Nominal current	2 A
Control voltage	24 V DC
Ambient temperature	10 °C – 50 °C (non-condensing)
Power supply	380 – 480 V AC, 3 Ph, PE
Frequency	50/60 Hz

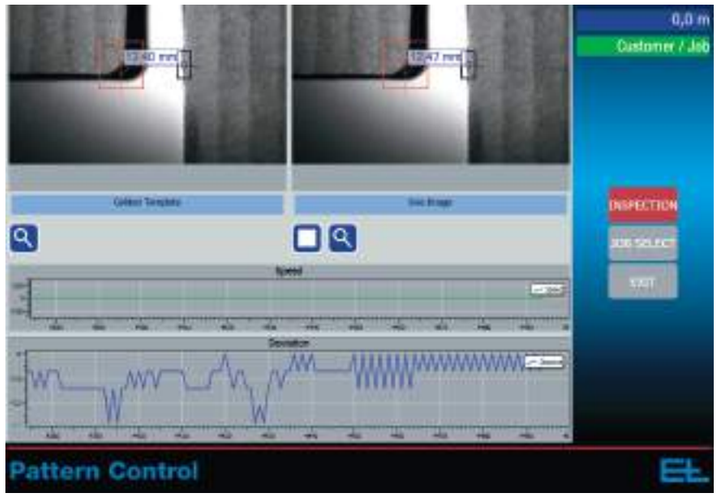
Benefits

+ Increased corrugator productivity
+ Improved paper material control



ELCorrVision-Pattern

The ELCorrVision-Pattern system automatically inspects the complex shapes, print and die-cut patterns of box production to ensure repeatable quality in the production of corrugated sheets and in the conversion into the finished box processes. Our high-resolution colour camera can be stationary mounted to inspect a defined area or integrated in a moving support to allow full width inspection. Depending upon application requirements, the ELCorrVision-Pattern can be configured with multiple cameras to increase the number of repeats inspected and / or to increase the resolution of the faults being detected. The ELCorrVision-Pattern uses a master template to determine deviation of product quality from the master template. The system is programmable, ensuring action is taken if target tolerances are not achieved. Output signals are available, enabling defective sheets to be removed automatically at a number of process points, or manually, upon an alarm signal with data logging of defective sheets being a further possibility.



Technical data

Power consumption	< 1 kW
Resolution	Up to 1.3 MP
CCD matrix sensor	CMOS / Mono / Color
Illumination	LED internal/external (depending on type of application
Power supply	100 to 240 V AC/400 W (± 10 %)
Frame rate	Max. 50 fps
Interface	Gigabit Ethernet interface
Camera technology	Smartcam
Cable length	Up to 100 m network cable
Features	Position tracking X/Y and rotating position; Pattern matching / contour
Trigger	Sensor or I/O
Ambient temperature	+5 °C to +40 °C (non-condensing)

Benefits

+ Monitoring, logging and controlling running webs or sheet processes
+ equipped with state-of-the-art camera technology and image processing algorithms
+ Inspection of
  - geometrical shapes and distance of patterns in reference to each other
  - several reference points to each other
+ Register Control
  - Print to print
  - Print to die cut
  - Print to slot

ELCorrVision-Scan

The ELCorrVision-Scan has been specifically developed for image monitoring processes which have space restrictions that prohibit conventional vision systems from being used. The IP 65 protection class allows the ELCorrVision-Scan to be used in the harsh environments associated with the corrugating process while ensuring accurate and reliable performance. The high speed processing of up to 5 images per second makes the ELCorrVision-Scan an ideal solution for monitoring the accuracy of the cross cut to the printed cross cut mark. In addition to allowing operators to being able to view the deviation from cut to mark accuracy, the ELCorrVision-Scan software records the deviation of cut to mark registration of each sheet to be comparted to the master template.

Technical data

Computer / 24" monitor	
Power supply	100 to 240 V AC/400 W (± 10 %)
Nominal frequency	50 to 60 Hz
Operating system	LINUX
Ambient temperature	+5 °C to +40 °C (non-condensing)
Protection class	IP 30
Resolution	1920 x 1080 FHD
Camera	
Digital zoom	2 x CMOS Chip
Resolution	2 x 2596 x 1944 Pixels (5 MP)
CCD matrix sensor	CMOS / Mono / Color
Field of vision	Min. 25 x 23 mm, max. 360 x 270 mm
Web speed	Max. 600 m/min
Ambient temperature	+5 °C to +45 °C (non-condensing)
Protection class	IP 65

Benefits

+ Image monitoring for applications with limited space for vision systems
+ Applicable for corrugated and converting processes
  - Cut to mark accuracy
  - Cut to print image accuracy
+ Designed for harsh and dusty environments

E+L Corrugated. Our dedication to service

At E+L Corrugated we view every aspect of our business as a service to our customers and we fully understand that in order to add maximum value to our customers' business, we must ensure that supplying world class products is complemented by supplying world class service.

Our goal is to provide world class service during every aspect of our relationship with our customers, starting from initial contact and continuing throughout the entire extended lifetime of our systems operating in the field.

In addition to utilising the network of technicians and engineers that belong the various wholly owned E+L subsidiaries, which are strategically located around the globe, E+L Corrugated has a team of highly experienced and dedicated installation and service engineers, which operate in a number of key roles.

Firstly, understanding the need to ensure that all installations meet agreed time lines, our service team play a key role in the organising of upcoming installations, in which they then operate as working supervisors. Their knowledge is then utilised to help provide after sales support, including service contracts, remote support and spare part requirements.

Erhardt+Leimer Corrugated cooperates with 13 subsidiaries and a variety of representatives all around the world

Services

Remote service – always there for you

Due to our global install base, E+L Corrugated has always placed great importance on the ability to supply our customers with remote on-line support.
We continually assess the latest available technology to ensure that we expand this service in-line with the technical capabilities available to us, allowing us to offer cost effective remote analysis, resulting in the fastest possible response times to our customer's requirements which include system optimisation, software updates and of course, remote assessment in the unlikely case of system misfunction.

MB CONNECT LINE
remote maintenance solutions

Our contact details

Sales
E-Mail: sales-elbi@erhardt-leimer.com
Phone: +49 521 942 720

Service
E-Mail: service-elbi@erhardt-leimer.com
Phone: +49 521 942 720

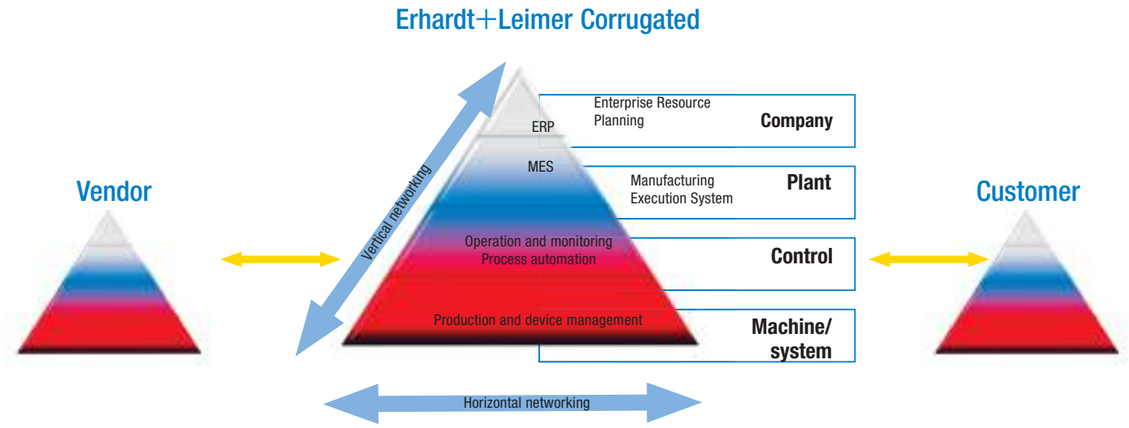
24/7 availability (outside office hours)
E-Mail: service24@erhardt-leimer.com
24/7 service support telephone: +49 171 534 27 81

www.el-corrugated.de

Into the future with Internet of Things (IoT)

Production meets digitization

Intelligent, self-organizing processes are a key component of IoT. The digitization and networking of individual components has gained greatly in significance. It creates the basis for end-to-end automation of the entire production process - from the cross-machine production sequences to the overriding delivery relationships of individual companies within a supply chain. The data acquired at all levels of the production process make up a decisive part of the automation. The generation, selection and evaluation of digital data creates a high level of transparency in complex processes. It helps to optimize processes in real time and creates new machine-related and autonomous value creation processes.



Internet of Things (IoT) at E+L Corrugated

Self-healing system

+ Automatic configuration recovery
+ Direct restore from the network
+ Secure and controlled communication within a web guiding system
+ No analog transmission paths

Neural network

+ Self-organizing system
+ Intelligent control components
+ Continuous digital communication

Interface ability

+ Large number of fieldbus interfaces (optional)
+ Integrated fieldbus interfaces
+ Remote maintenance (optional)

Intuitive system handling

+ Web-based management of each control component
+ Individual retrieval of the system overview
+ Simple, intuitive commissioning

Headquarter Corrugating Industry
Erhardt+Leimer Corrugated GmbH
Friedrich-Hagemann-Str. 64 · 33719 Bielefeld, Germany
Phone: +49 521/94272-0
contact@el-corrugated.com · www.el-corrugated.de

Corrugated

Sister companies
E+L Bradford, England · E+L Mulhouse, Frankreich · E+L Stezzano, Italien
E+L Bucharest, Rumänien · E+L Burlington, Kanada · E+L Duncan, S.C., USA
E+L Guarulhos-São Paulo, Brasilien · E+L Ahmedabad, Indien · E+L Hangzhou, China · E+L Tao Yuan, Taiwan · E+L Yokohama, Japan · E+L Seoul, South Korea · E+L Bangkok, Thailand

Subject to technical modifications without notice · BRA--251637-EN-01· 01/2019

www.el-corrugated.de