

# COGNEX

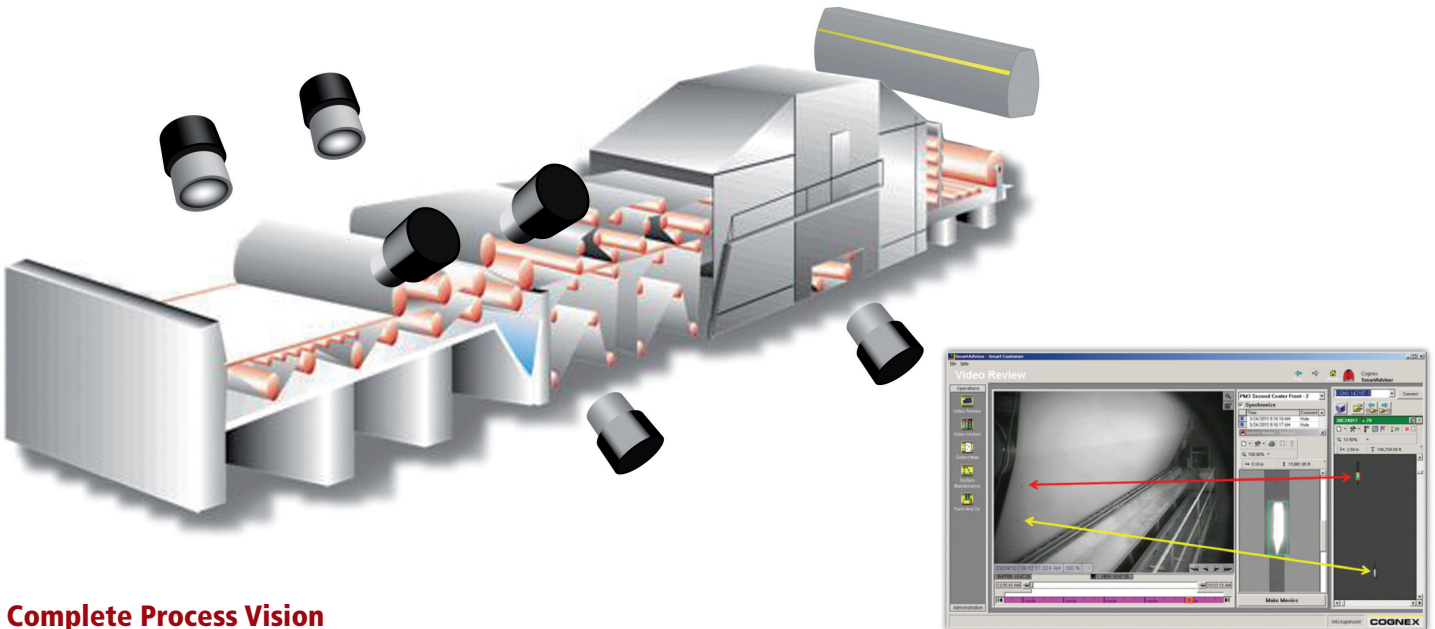
## SMART SYSTEM™

## Vision Solutions for the Entire Papermaking Process

Cognex Corporation is the world's leading provider of vision systems, vision software, vision sensors, surface inspection systems and web monitoring solutions used in manufacturing automation.

In October 2009, Cognex strategically acquired SmartAdvisor, a leader and one of the original technology pioneers, in web monitoring systems, creating the world's largest combined installed base of Web Inspection (WIS) and Web Monitoring Systems (WMS).

We are proud to announce the release of SmartSystem, the next generation of complete process vision solutions from Cognex. By leveraging the industry leading power of SmartView (WIS) and SmartAdvisor (WMS) into one scalable package, Cognex can provide customers with a comprehensive window into their entire process. SmartSystem maximizes ROI by coupling integrated visual information with the Paper Industry's most advanced suite of post-processing controls for winders, slitters, coaters, supercalenders and cutters.



### Complete Process Vision

SmartSystem's flexible front-end design ensures that the complete papermaking process from headbox to reel can be evaluated using best fit camera technology. By layering the process with vision, operators and engineers can quickly determine the root cause of defects and identify process upsets. SmartSync software enables existing SmartAdvisor or SmartView customers to seamlessly add this additional functionality to their system.

All cameras from wet-end to dry-end are synchronized to an exact relative sheet position. Videos and defect images are integrated into a composite visual quality map of the product and papermaking process. Critical defects and process upsets automatically trigger a ten second video of the sheet at each camera vantage point. The visual synthesis between upstream and downstream cameras provides the foundation for SmartSystem's classification, post-processing and reporting tools.

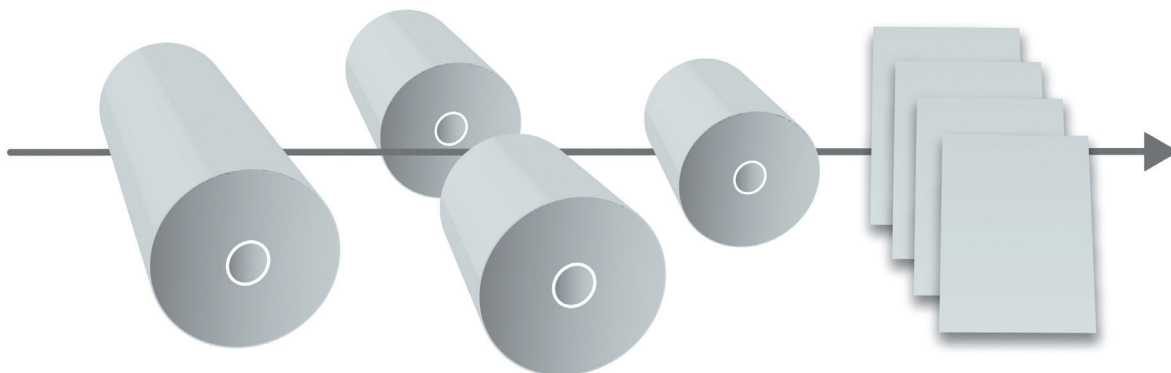
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## Complete Process Optimization

SmartSystem includes numerous post-processing modules that can feed forward visual information to downstream process for active process control. The SmartSystem solution can be scaled up to provide synchronized vision and process control across the entire papermaking value chain. By automatically tracking product and its associated defects across multiple operations, users can increase productivity and guarantee absolute visual quality.

By utilizing these post-processing tools, customers routinely decrease winder breaks by 40%, increase OMC/SC throughput by 20%, and improve overall process efficiency by 3-5%. Companies now have the ability to guarantee zero visual defects per saleable unit of production. Early adopters have already taken advantage of the SmartSystem solution to increase the sales price of their products by 10%.

<b>Paper Machine</b>	<b>Winder/Slitter Control</b>	<b>Super Calender &amp; OMC Throughput</b>	<b>Cutter Control</b>
 <p>Reduce customer complaints, maximize unit sales price and differentiate product brand by certifying the paper's visual quality.</p> <p>Monitor and optimize wet-end chemistry, machine fabric quality, calender roll cleanliness, creping and coating blade.</p>	 <p>Cognex's patented line synchronization technology enables defect information to be fed forward to value added process.</p> <p>Operators can review the inspection file, add/modify the trim pattern, edit the default target list and determine whether the winder stops or slows down for specific defects.</p>	 <p>Operators can proactively address incoming defects before final quality or production yield is compromised.</p> <p>Line synchronization technology enables multiple inspection files to be combined into a single comprehensive quality production map.</p>	 <p>Multiple rolls of paper can be combined into a layered defect map so that individual sheets or "sheet stacks" can be discarded by reject gates.</p> <p>Multiply tissue and liquid packaging operations can also be optimized using this "stack" technology.</p>



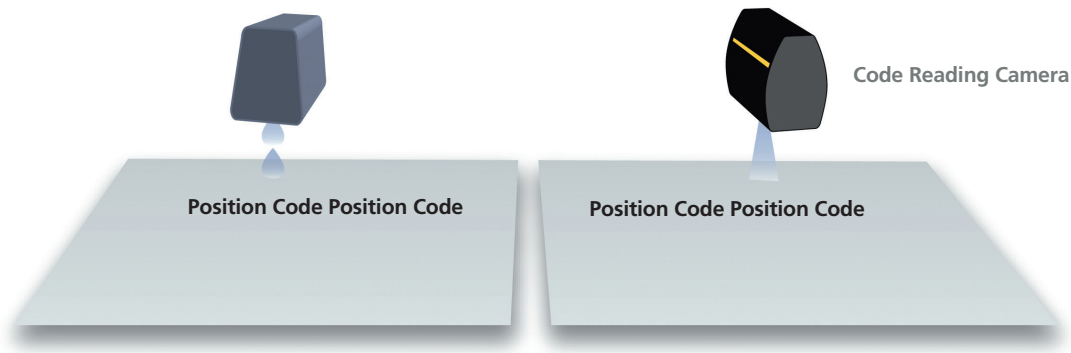
**Monitor and Optimize Yield across the Entire Value Chain**

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## Complete Process Synchronization

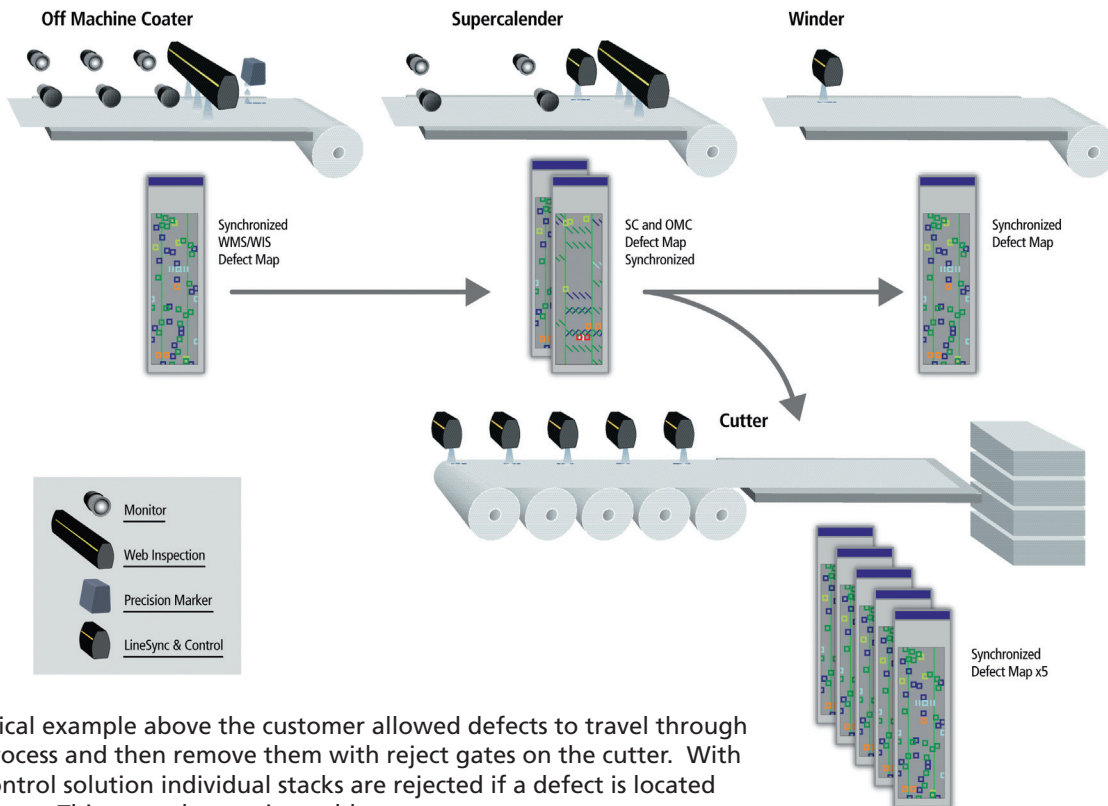
The foundation of SmartSystem's post-processing tools is built upon patented high precision marking technology. During the inspection process exact position codes are applied to the paper that enables downstream cameras to accurately determine machine position within millimeters.

The code encrypts the absolute linear position from turn-up for each unit of production (reel, roll, etc.). These codes enable users to accurately determine yield loss (slab-off, paper left on roll, etc.) and correct for the shrinkage in downstream processes.



The flexibility of Cognex's patented line synchronization technology enables additional code marks to be added if the original codes are trimmed off or coated over. Additionally, the codes may also be configured to include unit identification numbers in order to ensure accurate product tracking. The accuracy of the position code

provides the necessary environment for multiple inspections (papermachine, coater, supercalender, winder and cutters) to be combined into a single actionable product defect map. Line synchronization is also possible with third party or legacy inspection platforms.



In the graphical example above the customer allowed defects to travel through the entire process and then remove them with reject gates on the cutter. With the cutter control solution individual stacks are rejected if a defect is located within any layer. This control scenario enables customers to guarantee zero defect product without slowing down the upstream feeder processes.

# COGNEX

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