Product Information Note

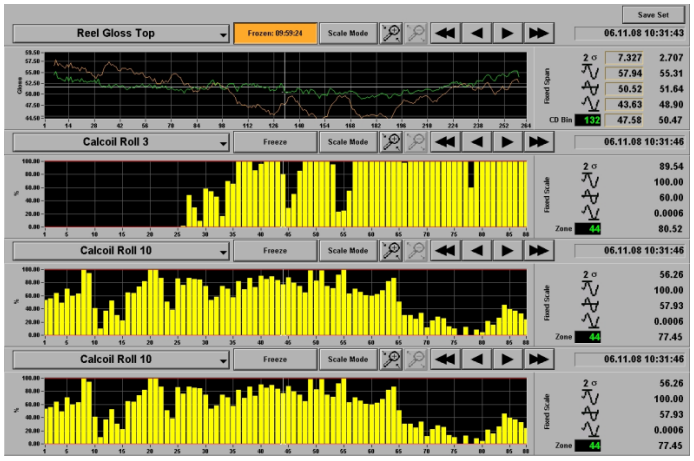
Honeywell

Experion MX Cross Direction Controls

Experion MX will help improve your business performance in today's challenging economic environment. This fully integrated quality control and process knowledge system provides superior visibility into the papermaking process while it simplifies your operational efforts and is easy and cost effective to maintain and service. Improve paper quality, reduce raw material, energy, services and maintenance costs, and increase production efficiency with a package of solutions that provides the lowest total lifecycle cost available.

Cross Direction Controls

The uniformity of a sheet's cross direction (CD) properties is important for all grades of paper to ensure high product quality and consistent performance in printing or converting operations. With paper machines commonly having multiple CD actuators, which affect multiple downstream sheet properties, it is imperative for a quality control system to have CD controls that can coordinate the actuators to provide the best overall sheet quality. Honeywell's Experion MX Cross Direction Controls utilize multivariable model predictive control technology to ensure product quality and downstream runnability to improve the economics of the paper making process through better utilization of resources and increased production efficiency.



Actuator Overview Display

Features and Benefits

- A true multivariable, array-based, model predictive controller. Provides optimal coordination of multiple CD actuator beams controlling multiple sheet properties.
- Controls high resolution profiles so no controllable profile data is lost through filtering.
- Automated configuration and commissioning of complex, highly coupled, processes using IntelliMap advanced tuning and mapping technology. Scenario switching supports changing control configuration grade-by-grade.
- Adaptive alignment provides long term control performance and reduces maintenance costs.
- Actuator and process constraints are taken into account. Increases actuators' effective control range and improves overall sheet quality and speed of recovery from upsets.
- Potential energy savings and production increases.

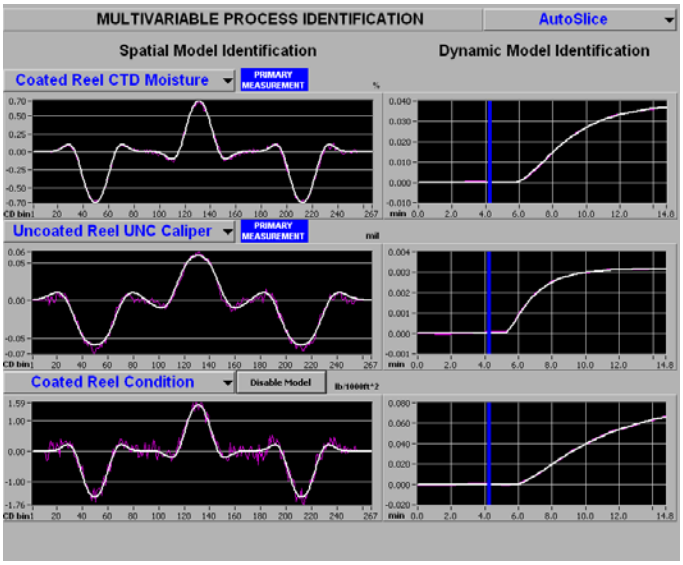
The multivariable, array-based model predictive controller used by Experion MX for CD control has been specifically designed to calculate the optimal actuator setpoints at the end of every scan. The current measured profiles, the model of each actuators response, as well as their physical constraints are all taken into account to minimize the future predicted profile variation. To ensure that all controllable variation is seen by the controller, all calculations are performed using high resolution profiles.

Recognizing that many paper machines produce multiple grades which may require different process configurations and control objectives, Experion MX provides scenario switching so that machine operators can change from one pre-defined control configuration to another, on-line, as needed. Control scenarios can contain any combination of actuators and downstream measurements to match those used in a particular process configuration.

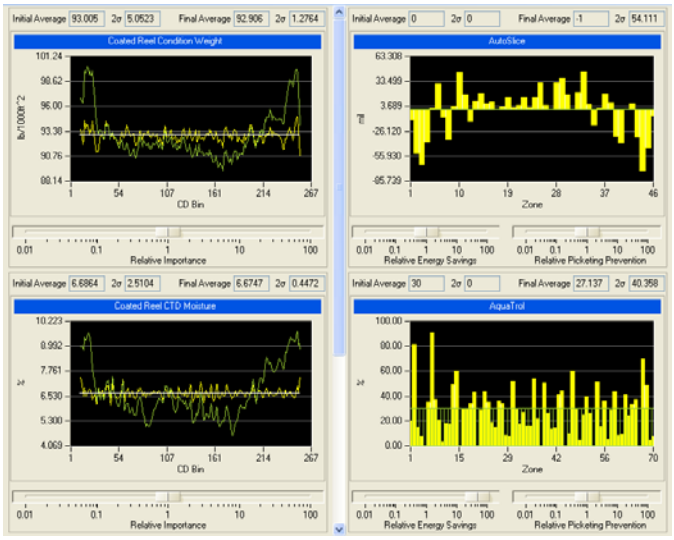
Scenario switching provides a high degree of configuration flexibility without the need for custom coded applications.

To control the most complex processes, Experion MX can implement a distributed control approach utilizing multiple multivariable CD controllers. Each controller is responsible for a specific process area, and its outputs are fed forward to downstream controllers. This approach simplifies configuration and troubleshooting and allows the performance of specific process areas to be optimized as desired. For example, wet-end CD controls could be segregated from dry-end to facilitate commissioning while keeping all the advantages of the complex multivariable controls.

Commissioning and tuning of the CD controls is accomplished with IntelliMap, Experion MX's CD identification and tuning tool. Automated bump tests identify the actuators' spatial and dynamic responses in all downstream measured profiles. Once the complete process model is built, IntelliMap automatically calculates the actuator alignment and all control tuning parameters.



IntelliMap's Multivariable Process Identification



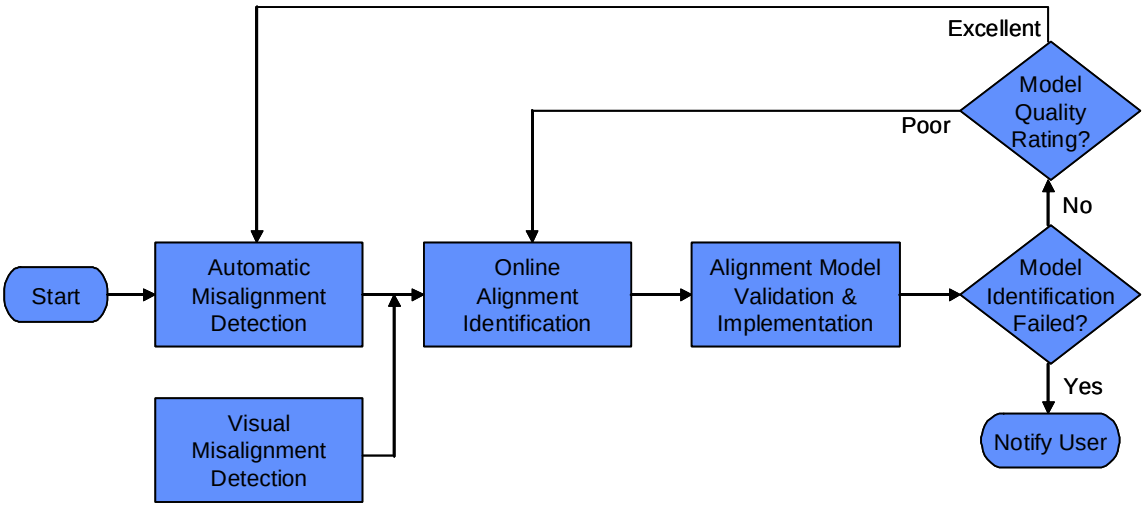
IntelliMap's Multivariable Simulator

If desired, the generated tuning parameters can be easily adjusted to achieve the following:

- Specify the relative importance of sheet properties to achieve specific control objectives.
- Choose the dynamic aggressiveness of the controller to set the recovery speed from upsets.
- Specify the amount of spatial aggressiveness of the controller to set the degree of streak rejection.
- Set the desired actuator setpoint profiles and costs associated with deviating from them.

Prior to implementation, tuning parameters can be verified using IntelliMap's multivariable simulator. Once the desired control performance is achieved, a single button press transfers the process model and all tuning parameters to Experion MX.

To ensure that the CD controls operate at a high level of effectiveness over the long term, Experion MX's Adaptive Alignment functionality continuously monitors the control performance to detect significant changes in actuator alignment. This occurs in the background during normal production operations, with the CD controls in closed loop. If new alignment parameters are needed to maintain performance, they can be implemented automatically, or reviewed and implemented with operator approval. If the new parameters are not found to improve the actuator alignment, service personnel are alerted to investigate further.



Experion MX Adaptive Alignment Flow Char

The flexibility, ease of configuration and maintenance and superior control results allow Experion MX CD controls to add value to the production of any paper grade. The traditional Weight, Moisture, and Caliper profile optimizers are coordinated to perform better, and new control combinations are now possible:

- True Advanced Finishing Technology for supercalenders, with ability to optimize caliper and gloss simultaneously through any combination of induction heating and dry end steam showers.
- Advanced wet end profile controls can optimize Fiber Orientation, Weight, and Moisture profiles simultaneously using slice lip, dilution profiling, and any combination of moisture profile controls including steam showers, rewet showers, and infrared heating systems.
- New scanning measurements, as they are introduced, can be integrated into the multivariable control scheme to further optimize existing profile controls or enable the use of new CD actuators.

More Information

To learn more about Honeywell's Experion MX solutions, visit www.honeywellprocess.com or contact your Honeywell account manager.

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