

Experion MX Machine 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 – Experion MX.

Machine Direction Supervisory Controls

As paper manufacturers continually strive to improve operational efficiencies and reduce production costs, the role of paper machine supervisory controls has moved beyond simply reducing product variability and attenuating process upsets, to the ability to model, control and dynamically optimize the paper making process for the most economical operation. Honeywell's Experion MX Machine Direction (MD) Controls utilize multivariable model predictive control technology to minimize material and energy usage, improve product quality and machine runnability and minimize grade change losses.

Features and Benefits

- Advanced multivariable model predictive controller with constraint handling and grade-dependent setup and configuration.
- Flexible control configuration without custom software
- Automated identification of process models
- Robust control technology requiring less frequent model updates
- Support for coordinated multiple model predictive controllers allows complex processes to be segmented for easier implementation and startup.
- Advanced open or closed loop grade change control
- Production and economic optimization through built-in cost-penalty models and dynamic range controls

At the heart of the Experion MX MD Controls is the Profit Controller, which is based on Honeywell's patented Robust Multivariable Predictive Control Technology. It minimizes the future predicted variation of all controlled variables (CVs) in the papermaking process while honoring both their quality constraints and any physical constraints on manipulated variables (MVs).



MD Control Summary display with production optimization running

Experion MX integrates the Profit Controller into the quality control system with a user friendly, easy to use, operator interface, streamlined configuration and support for multiple grade tuning groups. Closed or open loop grade change control is also provided. Automated model identification tools and the flexibility of the multivariable controls allows advanced control strategies to be implemented without requiring custom coded solutions. When new sensors are added to a paper machine, the process model simply needs to be updated; no changes are required to the controller itself. Some of examples of advanced control strategies are:

- Using the Experion MX Drainage and Formation measurements to optimize the use of wet end additives and sheet fillers while maintaining optimal sheet formation.
- Drying energy optimization using ExPress moisture sensors in the press and dryer sections
- Using the Experion MX Extensional Stiffness Sensor to measure sheet strength online and reduce fiber costs while maintaining paper strength.

Dynamic Economic Optimization

For processes with extra degrees of freedom (more MVs than CVs) the Profit Controller’s economic optimization layer works with its constraint handling and range control capabilities to dynamically evaluate raw material costs, product quality specifications and process constraints. When it determines that all CVs can be held within their quality specifications over the entire prediction horizon, the MD controls will manipulate the process so that it operates at the point of highest production or minimum cost. The operator is informed that optimization is occurring, shown the predicted steady state values for the MVs and CVs as well as which MV has the limiting constraint.

For fine paper applications, weight, ash, and opacity can be tightly controlled while minimizing fibre and filler costs. For board machines, fiber and steam costs can be minimized while meeting strength specifications. Even small incremental improvements can result in large economic benefits; reducing fiber usage or increasing production by as little as one percent can result in annual savings exceeding one million dollars.

Grade Change

Multivariable interactions, non-linear process behavior and differences in operator experience make it difficult to achieve consistently fast and smooth grade changes with a minimal loss of production. Experion MX provides automatic grade change control which can be executed with the supervisory MD controls in open or closed loop.

Easy to understand displays allow the operator to preview grade changes before they execute, monitor their progress and review previous grade changes. With the option of using linear ramping or nonlinear model based trajectories, fast and stable grade changes with minimal off specification product can be achieved for all paper processes. Grade change times may be reduced by 50% or more, relative to traditional grade change controls

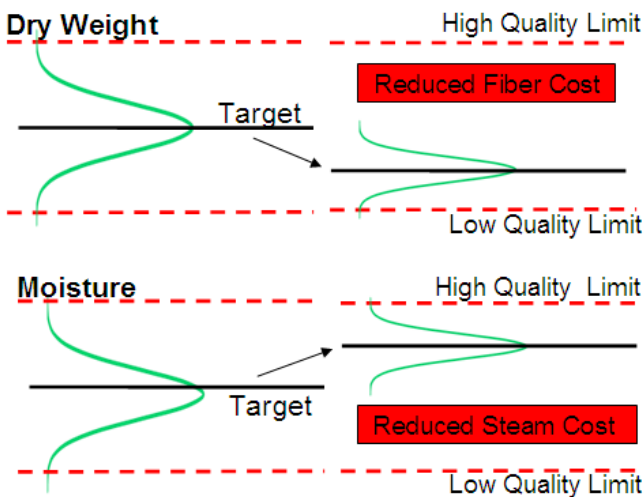
Grade Change Display / Grade Change Monitor / Grade Change Log

Grade Change OFF 0 %

Description	Unit	Status	GC Ready	Ramp Enable	Starting Setpoint	Current Grade		Target Grade	
						CODE00	Process Value	Retrieved Target	Entered Target
CV MS1	%	Manual	Red	Green	0.00	8.82	0.00	8.82	8.82
CV BW1	GSM	Manual	Red	Green	0.00	60.71	0.00	60.71	60.71
CV DW1	GSM	Manual	Red	Red	0.00	60.71	0.00	60.71	60.71
MV StockFlow	Lit/min	Manual	Red	Green	0.00	0.00	0.00	12000.00	0.00
MV MachSpd	m	Manual	Red	Red	0.00	0.00	0.00	1000.00	1000.00
MV Steam	psi	Manual	Red	Red	0.00	0.00	0.00	110.00	110.00
MV Steam2	psi	Manual	Red	Red	0.00	0.00	0.00	140.00	140.00
MV Steam3	psi	Manual	Red	Green	0.00	0.00	0.00	130.00	0.00

Next Grade: TESTORP
 Sheet Break Action: Ramp Normal
 GC Control: Water grade loaded, MIS Enable
 GC Duration: 0.00 [min]
 GC Total Time: 0.00 [min]

Grade Change summary display



Target shifts result in reduced costs

More Information

For more information on Experion MX, visit www.honeywell.com/ps or contact your Honeywell account manager or field service leader.

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PN-11-12-ENG
May 2011
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