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СИСТЕМЫ УПРАВЛЕНИЯ

Руководство пользователя

на Experion MX

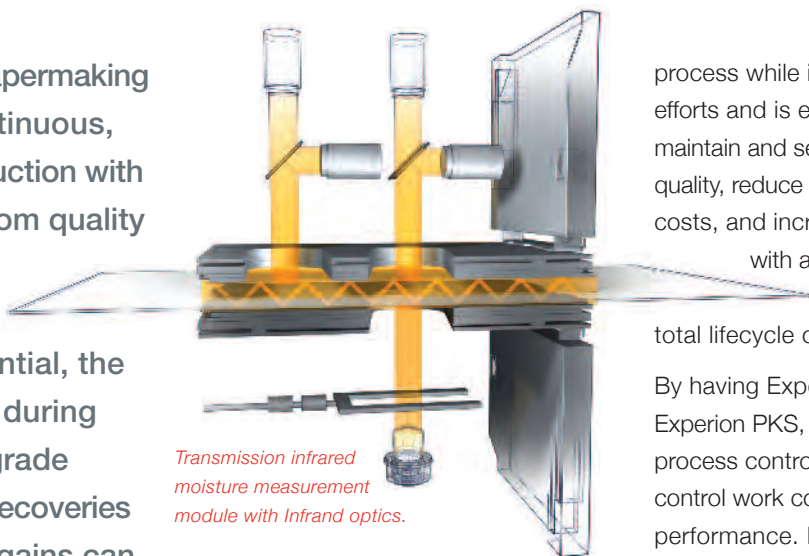


An Innovation in Papermaking

 Profitable papermaking means continuous, stable production with minimal deviations from quality specifications. While steady state control performance is essential, the elimination of waste during transitions such as grade changes and break recoveries is where the greatest gains can be achieved.

As production rates rise, often stretching the design capacity of the paper machine, Honeywell's Quality Control System (QCS) allows you to improve production efficiency and quality.

Honeywell's newest innovation in QCS is Experion® MX, integrated with Honeywell's Experion Process Knowledge System (PKS).



Transmission infrared moisture measurement module with Infrand optics.

This solution offers fast scanning and processing speeds, with superior measurement technology, high resolution cross-direction profile control with a full offering of intelligent actuators, and the industry's most comprehensive suite of quality control applications.

Experion MX builds on Honeywell's 40 years of experience in leading QCS technology and performance. This solution is an integrated quality control and process knowledge system which provides superior visibility into the papermaking

process while it simplifies operational efforts and is easy and cost effective to maintain and service. Improve paper quality, reduce service and maintenance costs, and increase production efficiency with a package of solutions that provides the lowest total lifecycle cost available.

By having Experion MX integrated with Experion PKS, production, quality and process control, machine logic and drive control work cooperatively to maximize performance. In addition, Experion enhances safety, environmental compliance, energy efficiency, cyber and physical security, as well as asset and lifecycle management. Integrating these systems ensures that better and more focused information gets to key decision makers. Having these systems integrated assures more efficient process design and execution, better system operation and higher quality service.

Honeywell Portfolio of Pulp and Paper Solutions

Experion MX

Modular measurement platform

- Scanner
- Measurement for every need

Multivariable control for every sensor and actuator

- Machine direction (MD)
- Grade and shade change (MD)
- Cross direction (CD)
- Multi profile – multi actuator optimizing (CD)

CD actuators for closing CD loops

New digital distributed web monitoring

Integrated web inspection

Integrated condition monitoring

New operator interface (HMI)



Integrated within Experion PKS

- Experion MX
- Distributed control of pulping and papermaking process
- Advanced control and optimization in the pulp mill
- Safety systems
- Physical and cyber security
- Asset management
- Lifecycle management
- Business applications



The Experion MX scanner has been re-engineered to meet the changing needs of production and maintenance departments.

Easy to Service and Maintain

The modular structure of the scanner and sensors makes maintenance easy and reduces spare parts inventory, reducing the cost for both. It also makes upgrading or changing measurements easy and affordable.

The highly reliable equipment, coupled with built-in diagnostic functions, requires less maintenance, service and on-site expertise to keep the system functioning at top performance. System diagnostic tools guide a service person right to the source of the problem so a resolution can be accomplished quickly and easily.

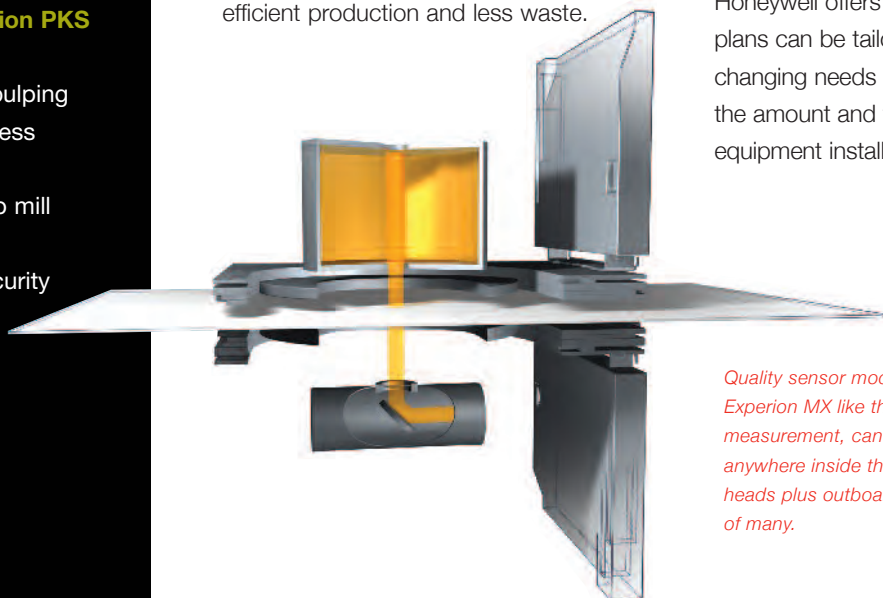
Maintenance planning tools reduce unplanned shutdowns and enable labor and parts to be forecasted, significantly reducing costs for both.

Honeywell offers flexible service options so plans can be tailored to the specific and changing needs of the site, independent of the amount and type of Honeywell equipment installed.

Easy to Operate

Experion MX is fully integrated with the Experion architecture reducing training requirements and providing easy access to operational functionality from mill-wide production planning to individual machine logic functions all in one platform. It is easy to create and configure unique supervisory and loop-level controls, and expand functionality in the future with new sensors, actuators and DCS functionality.

Integrated process performance analysis like web inspection, web monitoring and condition monitoring, together with measured quality data, easily track the root cause of breaks, defects and process variability so they can be rectified for more efficient production and less waste.



Quality sensor modules for Experion MX like this ash measurement, can be located anywhere inside the measuring heads plus outboard mounting of many.

Superior Process Visibility and Quality Control



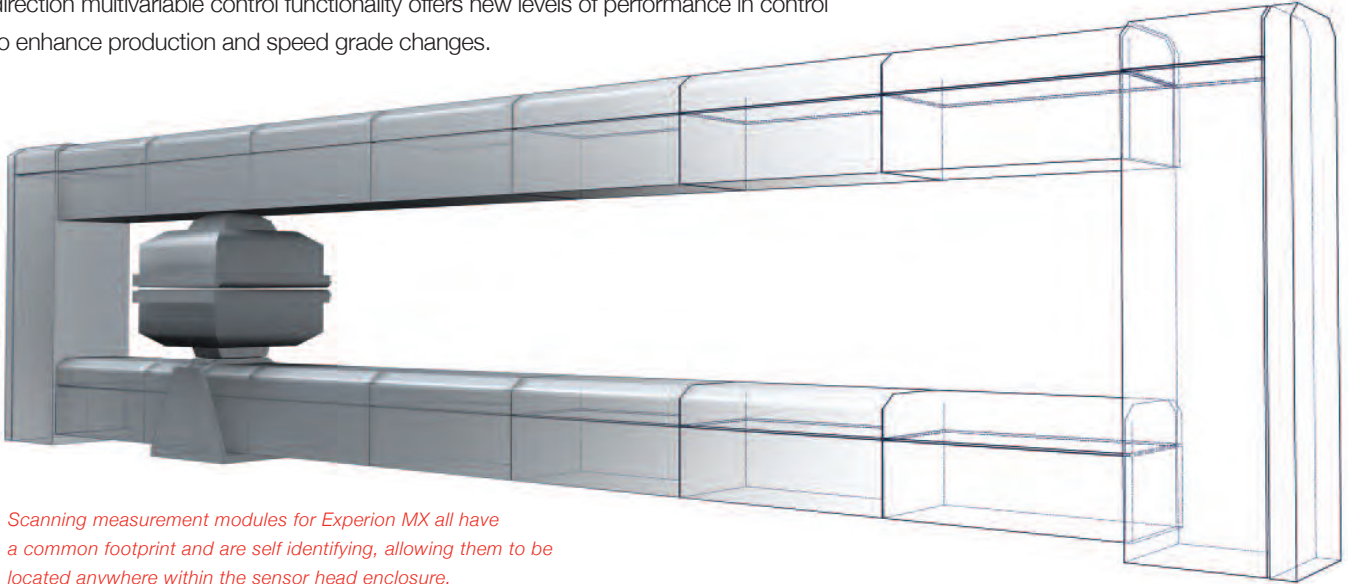
The vast array of Experion MX sensors addresses virtually every online measurement need in paper, board, tissue and specialty paper.

Measurements provide information throughout the process, from the wire to reel. The newest offerings include press section dry content, coating immobilization point, strength and imaging camera sensors for formation fiber orientation and surface topography. All this provides outstanding

process visibility and controllability. Combining this superior visibility with new machine direction multivariable control functionality offers new levels of performance in control to enhance production and speed grade changes.

Lowest Total Cost of Ownership

The enhanced features of Experion MX enable superior performance while simplifying system operation, maintenance and serviceability, contributing to the overall lowest cost of ownership for QCS functionality on any paper, board, tissue and specialty process.



Scanning measurement modules for Experion MX all have a common footprint and are self identifying, allowing them to be located anywhere within the sensor head enclosure.



Experion MX O-Frame Scanner

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.

O-Frame Scanner

The Q4000 O-Frame Scanner with the Experion MX Quality Control System (QCS) provides a high-speed, accurate and robust platform for the full-line of Honeywell quality sensors. The Q4000 builds on more than 40 years of leading the industry with breakthrough measurement technology, including enhanced mechanical performance, significant improvements in signal handling, state of the art engineering tools and advanced diagnostics. The net result is a scanner that is easier and more cost-effective to operate, service and maintain. The Q4000 with Experion MX is capable of delivering full-width, high-resolution profiles at high scanning speeds for every key quality parameter important to the



papermaker. It can scan every ten seconds or faster for most machines, enhancing your business performance by improving paper quality, reducing raw materials and energy consumption, and increasing production efficiency.

Features and Benefits

- Engineered beams with integrated thermal equalization channels provide a rigid foundation for precise measurement for the widest processes and most extensive sensor complements.
- Heavy-duty, stainless steel beam covers with individually removable sides allow easy access to internal components while protecting them from dust, moisture, process spray and heat.
- Superior measurement head stability and alignment is achieved with a robust track, head carriage and vector drive system, ensuring reliable operation and easy maintenance.
- Precision signal processing ensures highly accurate profiles with narrow measurement zones and fast scanning rates. Full-width, fast-scanning at up to 1,200 mm/sec [48 in/s], detects profile changes many times faster than conventional slow-scanning systems.
- A comprehensive set of maintenance tools and diagnostic displays provide a sound environment for service and maintenance.
- Experion MX leverages the full-width fast-scan capability of the Q4000 to simultaneously support the needs of advanced MD & CD multivariable process control, process diagnostics and SPC analysis, high resolution profile displays, site-specific quality & MES reporting, and data collection for mill-wide historian systems, etc., all without changing "mode". In addition to normal full-width scanning mode, single point, narrow scan and variable scan speed are all available at the user's request.
- Measuring heads are designed for continuous operation in hostile paper machine environments to ensure reliable,

low-maintenance operation and provide the optimum environment for accurate measurements under any process conditions.

- Flexible mounting arrangements for self-identifying sensor modules within and around the measuring heads accommodates all desired on-line measurements even in confined process spaces.
- Redundant Ethernet communications provide fast, easy, low-cost scanner installation and bring system reliability to a new level.
- Dynamic Z-axis (vertical) correction continuously eliminates residual error in weight measurement for sheet gap changes.
- Dynamic X-and Y-axis alignment measurements continuously monitor the alignment of upper and lower measuring head enclosures, providing at-a-glance verification of the overall physical performance.
- Accelerometers integrated into the upper and lower measuring heads provide immediate visibility of any abnormal behavior or drive system mechanical problems.
- The Embedded Thermal Equalization System (T.E.S.) effectively eliminates thermally-induced beam deflection and enhances measurement accuracy in non-uniform or changing thermal environments.

Stable Support for Measurements

The Q4000 O-Frame Scanner is an integral component of the Experion MX measurement and control system. It is designed for fast, accurate measurement with any complement of sensors, for the widest processes and most hostile production environments.

The scanner spans the process with highly engineered beams that have embedded thermal equalization channels in the design. Steel roller bearings ride on replaceable bearing inserts set into a track engineered to constrain travel to a linear motion. The wear resistant track and roller design provides a stable and long lasting base for measuring heads movement. During scanner manufacturing, the carriage tracks are laser aligned with exacting tolerances; in the field, dynamic X-Y-Z-axis displacement and three axis accelerometer measurements track changes in head alignment on-line and in real-time. A unique configuration of load-bearing and "capture" wheels effectively lock the carriages onto the tracks to counter lateral forces and maintain precise machine-direction sensor alignment. Smooth but fast motor speed ramping is provided

by a state-of-the-art vector drive and steel-reinforced, stretch resistant drive belts, which minimize cross-direction measurement head misalignment. Individually removable covers with integral seals exclude dust, moisture and other contaminants, minimize process-heat induced thermal gradients across the beams, and also allow the pressurization of beam covers and end columns in extreme environments.

Basis weight measurements are corrected for sheet gap height changes by the dynamic Z-axis sensor. Accelerometers integrated into the heads provide immediate feedback of any abnormality in the measuring head transport system. For high-temperature gradient environments, the embedded T.E.S. provides closed-loop liquid circulation within the beams to prevent thermally induced beam deflection by moving heat from high temperature locations to cooler temperature locations.



Two versions of measuring head enclosure support either four or six sensors inboard, with the flexibility to mount up to four additional sensors outboard, in machine-direction and/or cross-direction positions enabling a full complement of measurements even in confined process spaces. The measurement heads' internal temperature is stabilized, ensuring accurate measurement under all conditions. Heated sheet guides and heated air wipes prevent condensation in the sheet gap and ensure accurate standardization of measurement.

Fast, Precise Measurement

Self identifying sensor modules enable any measurement to be located in any head location, providing maximum flexibility combined with ease of maintenance. The system shows you where each sensor module is and automatically prevents sensor module mismatches causing unsafe operation. Each sensor head signal is anti-alias filtered and then oversampled at 1 MHz providing a 16 bit averaged sample every 250 μ s [4 kHz]. This technique effectively integrates 100% of the sensor module signal while precisely preserving visibility of the

smallest, high-frequency process variations. Experion MX accurately allocates readings to measurement databoxes using the measuring head position encoder data stream and each sensor module's time constant, spot size and physical position within the measurement heads. Strict synchronization of sensor module and head-position-encoder sampling ensures superior precision. The resultant raw-signal values are communicated from the sensor module across the measurement LAN to the Experion MX Application Server, where profile values are calculated and engineering unit conversions are made to end-user units. These form measurements for display, control, reporting, alarming and other applications. The redundant Ethernet communication system ensures outstanding reliability.

To provide the clearest picture of the process, the entire web is presented in 2-5 mm [0.08-0.20 in] databoxes to reveal the narrowest streaks. The profile is also available in wider mapped zones to reveal gross profile characteristics. The Experion MX O-Frame Scanner scans up to 1,200 mm/sec [48 in/s] to resolve profile changes many times faster than slow scanning systems. This results in faster measured profile response to profile changes, enabling faster control actions and increased productivity.

The fast response of Experion MX measurements, coupled with the Q4000 scanner's unique signal processing, enables the sensor modules to scan off the sheet edge, providing the industry's clearest picture of sheet-edge quality for improved profile control, where rejects are typically the highest. To accommodate any measurement strategy or process constraint, separate measuring head turn-around criteria can be defined by the user for both sheet edges, including turn-around at a specified position, a specified distance before the sheet edge, or a specified distance past the sheet edge.

Lowest Life-cycle Cost

The O-Frame Scanner design leverages well-proven techniques to deliver reliable performance. New technologies have undergone extensive testing before implementation, including extended operation in a scanner test chamber at 100°C [212°F] and 95% relative humidity.

The brushless AC drive motor, vector drive controller, and belt-and-pulley transmission are designed specifically for long life and low maintenance. The drive belts are horizontally oriented for low belt-tension operation and extended belt and bearing life. The scanner end column enclosure design provides easy

access to wiring terminations, electronics, drive motor and belts.

To allow easy access to all components, the scanning measuring heads have removable covers aligned to give easy access to each sensor without obstruction. Individual Experion MX sensor modules slide on mounting rails into the measuring heads for fast insertion and removal. Plug-and play / self-identifying sensor modules can be installed into any location and the system automatically recognizes which sensor module is in a particular location. No messy cooling fluid connections are required for sensor modules.



Upper and lower measurement heads are easily separated using a convenient end-column-mounted key-switch to facilitate cleaning and service of sensor windows. The Experion MX measuring head internal temperature and relative humidity measurements are continuously monitored by the system, with alarms for out-of range conditions; over-temperature protection circuitry disconnects power.

All scanners in a system communicate with the Experion MX Application Server via a standard Ethernet measurement LAN using TCP/IP protocol, making scanner installation inexpensive, fast and easy. In addition to standard operator

Experion MX Q6088



Honeywell has launched the Industrial Internet of Things (IIoT)-enabled Experion MX Q6088 Compact Scanner, designed for paper producers, flat sheet manufacturers and original equipment manufacturer (OEM) machine vendors.

The Experion MX Q6088 Compact Scanner supports a broad portfolio of high-performance sensors, including combined weight and moisture measurement with Honeywell's MXIR infrared sensor technology. For many applications, this means eliminating the need for a nuclear source.

The Q6088 complements Honeywell's quality control system for the paper industry (Experion MX), which has advanced multi-variable machine direction and cross direction controls for consistent quality and fast production transitions. It is suitable for most paper and flat sheet manufacturing processes, including tissue, board and coating lines.

The scanner leverages Honeywell's QCS 4.0, which transforms data into actionable insights for improved process quality and production performance. The cloud-based solution continuously monitors scanner and sensor health, production quality and control/process performance, delivering a "call to action" to stakeholder mobile devices. QCS 4.0 securely connects critical production assets to Honeywell cloud analytics. Access anytime, anywhere from any device enables effective maintenance, performance management, and expert-guided production optimization regardless of the level of worker skills available at the site.

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