SCIENTA ONLINE QCS *for better*

Paper
Speciality paper
Coated paper
Paperboard

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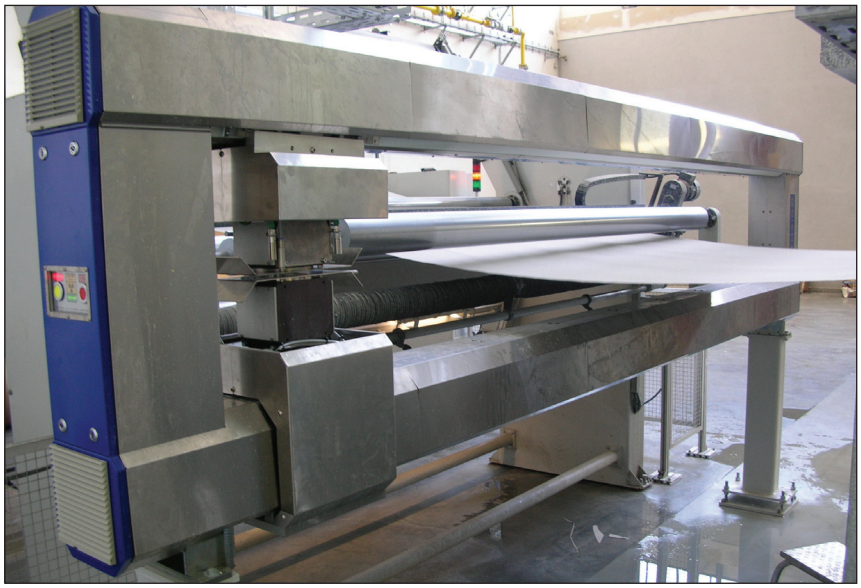


Scienta System 9 stands for Open Standards and Carefree Operation

- it relies on 50+ years of measurement experience
- it uses best practices
- it is based on open standards
- it uses open Fieldbus technology
- it provides expandable, flexible control
- it provides connectivity (to any DCS)
- it is affordable, because it is based on smart engineering and priced according to true costs as opposed to high fixed cost base

Modular heads - Intelligence and connectivity

All sensor and scanner support electronics are housed in modular heads inside the scanner frame, eliminating costly and redundant hardware and increasing system reliability.

The modular heads are intelligent with a high speed processor each that computes all sensor information, including inter-sensor and inter-scanner variables, into engineering units. Profibus DP interface is standard.

The heads provide data for profiles in high-resolution data box format. All profile computations are made inside the scanner PLC. No external electrical cabinet or PC is required.

The heads are designed as an integral part of the system, or to act as a stand-alone measurement sensor with a direct Profibus DP connectivity to the mill's DCS, PLC or PC based control, profiling or other MIS.

Scanner structure - Stability, precision and ease of maintenance

Compact scanner means it can be fitted into existing lines. Strong 180mm x 160mm (7.0in x 6.3in) I-beam structure ensures dimensional scanner stability for high measurement precision.

The totally enclosed structural beam provides protection from dimensional deviations due to external temperature variations.

Stainless steel scanner covers prevent dust and dirt contamination of the head transport system.

Head carriage is supported by 10 large diameter neoprene coated wheels for smooth scanning. It has a modular construction with all sensors mounted in-line in the machine-direction for simultaneous measurement. Automatic standardization and compressed air head cleaning function are standard.

A special drive-clutch system opens up in emergency situations. Operator safety is thus ensured when working near the scanner. A unique drop-down function opens the head 70mm (3in) for cleaning or to pass under threading chains or ropes.

Scienta Concept is based on Fieldbus technology

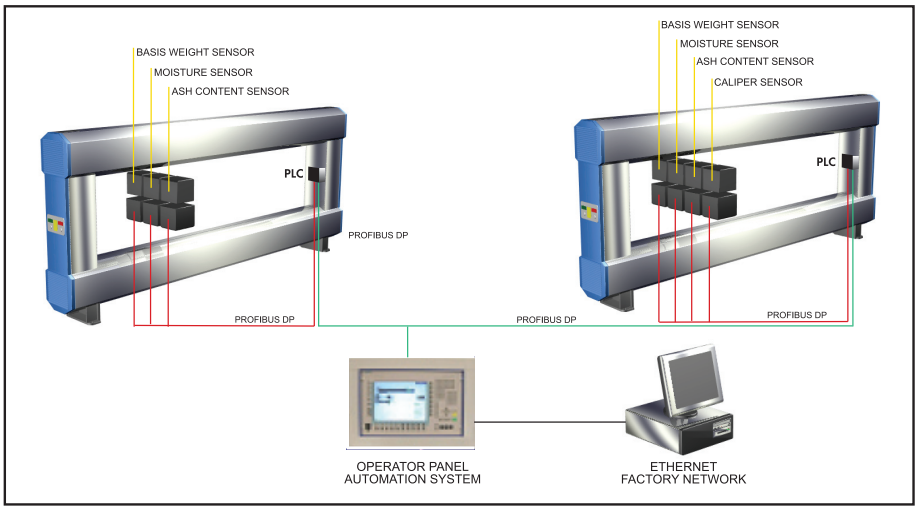
All sensors are equipped with a built-in Profibus DP or ModBus connection. It is not just added to the sensor electronics: it is an integrated part developed by Scienta Systems in Manchester, U.K.

We use high performance 32-bit RISC processors to get the performance needed to do real-time floating-point calculations in the sensor board. Furthermore, the whole electronic part of the sensor is fitted on a single PCB board, which is embedded into the sensor mechanical structure. Component count as well as the number of spare parts is low.

Fieldbus technology starting from the sensor itself means less connectors, less cabling and more reliability. And it means an impressive amount of diagnostic information. The customer treats the Basis Weight sensor or the Moisture sensor as any Fieldbus sensor in his factory - as an intelligent, standard component!

A standard PLC is handling the various tasks of the scanner. The PLC is built-in into the scanner frame itself and it has I/Os for the various sensors in the frame. Connection to the sensors is through a single robotic grade cable running to the sensor platform. No more need to look for ground loops and loose connectors because all sensor signals are already in a standard Fieldbus format.

The Scanner PLC is programmed using a high level language to overcome the need for a PC or other electronics to handle the complex tasks of the scanner itself. The PLC program will acquire all the profile data independently and is ready to upload readily processed values to the QCS system using LAN or Fieldbus connections. The Scienta scanner may be connected to any DCS system using industry standard OPC connectivity or through the use of vendor specific links.



HMI - Human Machine Interface

All operator interfaces are tailored to customer specific requirements. If preferable, the user interface can be directly integrated into client's existing process control systems, even using the customer's own software.

Scienta uses Siemens WinCC, Wonderware InTouch, Allen-Bradley RSView32 and Borland Delphi or other applicable software to configure the operator panels.

OPC is used as a standard protocol for exchanging data between systems. Scienta can provide Web Server applications based on XML for easy distribution of data.

All Scienta HMI's are:

- Easy to use
- Tailored to each production line
- Direct connection to the sensor platforms
- Easily understood graphics format (profiles, trend curves)
- Recipe functions
- Reporting facility and alarms
- Connectivity to factory databases.

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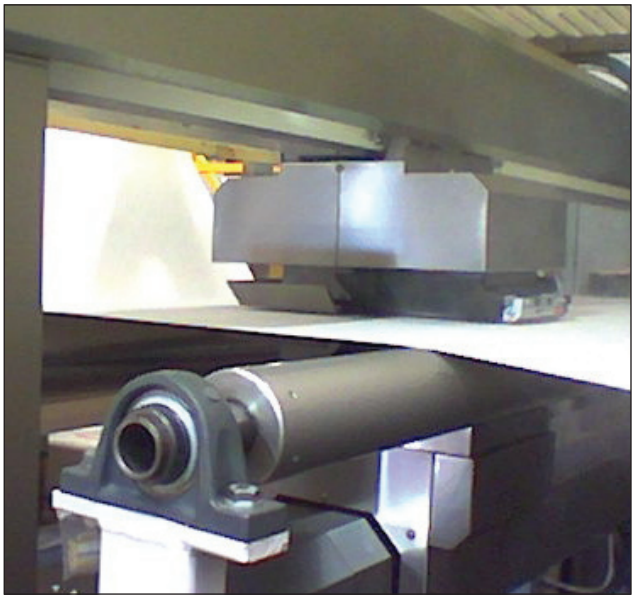
Accurate Basis Weight is the basis for reliable quality control



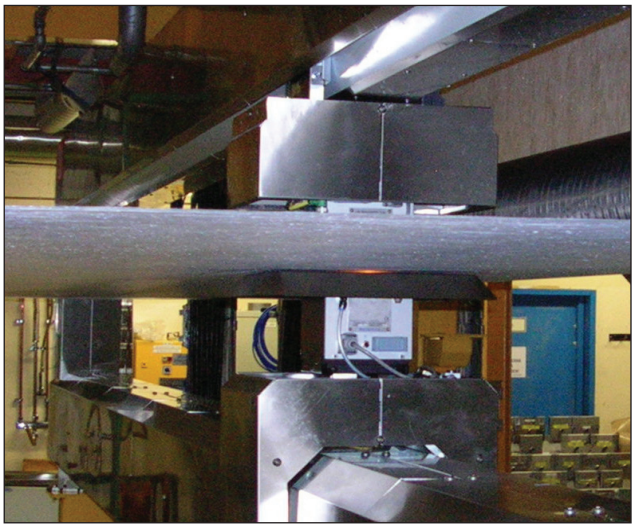
Scienta has pioneered the use of processor controlled measuring heads capable of real-time linearisation of the measurement signal. Thanks to Fieldbus connection the output signal can be easily and accurately interfaced to all sorts of computer and PLC equipment.

The Fieldbus connection enables monitoring of diagnostic data available inside the measuring head and controlling of the head in manners not possible with analog systems.

The Basis Weight sensor is based on the absorption of beta radiation in an Ion Chamber.

The sensor electronics are built into the receiver body making it a highly compact unit. Temperature compensation as well as the Chamber gas pressure monitoring are part of the extensive functionality of the Scienta developed sensor.

Moisture precision through optimal choice of measurement principle



NIR moisture meters are highly accurate due to 'same spot' measurement. It is maintained even with very low moisture content. As with all Scienta Sensors, the NIR measuring head is intelligent. The integrated processor handles linearisation, calibration and communications tasks. Stand-alone sensors are easy to interface directly to an Operator Panel using standard interfaces.

Microwave Moisture meters are highly versatile. They are the optimal choice of sensor if the number of product changes is frequent or where recycled paper is used. Measuring using microwave technology is based on the dielectric property of materials. As water has a much higher dielectric constant than cellulose, the proportion of moisture in the paper sheet is strongly reflected in its dielectric constant. This effect can be measured using microwave technology.

Ash content through gamma radiation absorption

The Scienta Ash content sensor is a double sided measurement using gamma rays (either as a natural source or from an X-Ray tube) detected by a scintillation detector. The sensor electronics is highly integrated and features a standard, built-in Profibus DP or Modbus interface. All calculations and compensations are performed in this single, high performance 32-bit processor. The receiver electronics includes sorting of different energy levels enabling a stable detection of coatings.

The X-Ray transmitter version uses a custom 10 kV power supply, which enables operation without extra cooling. The whole sensor is very compact and fits into the standard scanner sensor carriage. Great attention has been given to the mechanical mounting of the receiver tube. It has a floating 4-way attachment, which insulates it against mechanical shock. As the receiver electronics is mounted on a single board, the reliability of the sensor is very high.

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Precision and functionality are key features of Scienta Scanners

Dimensionally stable scanner construction ensures precise sensor alignment

The System 9 derives its exceptional mechanical stability from a steel I-beam construction. For corrosion protection, the platform is treated with an electroplating zinc coat. Mechanically, a scanning platform must have a good alignment of the upper and lower sensor heads under all conditions.

Sealed bearings with large diameter wheels assure smooth traversing with minimum wear

Sealed bearings are used for the large diameter 80mm (3.15in.) wheels supporting the head carriage. They are mounted on the head carriage to provide rigid support to the heads. The head platform is cast in aluminium to ensure rigidity and low weight.
The unique neoprene clad wheels also provide enhanced wear and reliability characteristics over linear bearing carriages. The lower head support wraps around the outside of the lower beam, connecting to the tracks from underneath the beam. This still provides the best protection against dust and dirt.
Also, the upper and lower beams are identical in construction ensuring equal movement and stress properties. Entry of contaminants into the beam is prevented by a special sealing flap cover. Both upper and lower beam openings are sealed in this manner.

Completely enclosed by external covers

Mechanical rigidity and stable temperature contribute heavily to scanner stability. The Scienta scanner provides for rigidity with I-beams, steel-reinforced drive belt and climatized construction. To achieve a stable temperature, the beam is internally pressurized with air and protected by stainless steel outer covers.

In conditions of temperature differences between the upper and lower beams, or across the width of the beam, circulation of the air internal to the scanner in a semi-sealed environment keeps the temperature uniform.

Temperature compensation/management

The sensor platform is thermally compensated for by using both heaters (for sensor bodies) and coolers (for sensor electronics). The head gap temperature is managed by using heated air curtains. Sheet temperature measurement and compensation of sensor readings are standard features.

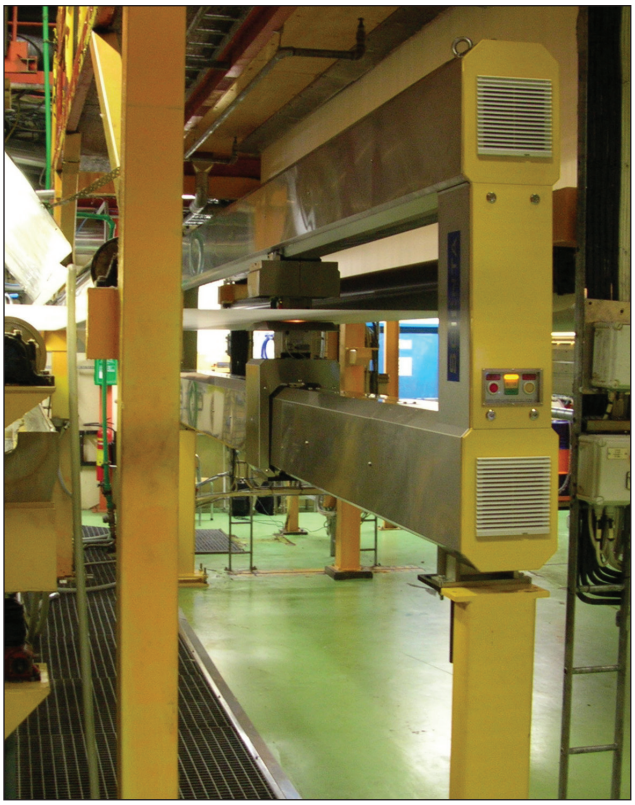
Precision Positioning

The scanner is driven by an inverter controlled AC motor, providing accurate control over speed and acceleration and precise positioning of $\pm$ 3mm ($\pm$ 0.12in.) in a single point. Upper and lower head alignment is guaranteed by a precision timing belt drive. An incremental pulse transducer is connected directly to the drive shaft. This, together with a position reference detector at the garage position guarantees accurate head positioning and sensor alignment at all times.

Heads are mounted in-line in the machine-direction to ensure simultaneous measurement. Power, air, and electrical signals are brought to and from the heads by a single robotic-grade cable designed for exceptionally long life. The cable can be replaced quickly and easily in the event of failure.

Sensor Internal Processor

To simplify both system operation and QCS integration, each head includes a processor that communicates across a Fieldbus with the scanner PLC. The scanner(s) may be interconnected with virtually any distributed control system, profiling system or mill information system.



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Technical specifications of Scienta Scanner model 9150

Construction
180 x160mm (7.0in. x 6.3in.) plated I-beam steel construction bolted onto 20mm (0.8in.) thick end plates.

Physical Dimensions
Scanner Width: 6800mm (268in.) max
Beam Width: 6000mm (236in.) max
Machine-Direction: 420mm (16.5in.)
With three sensors at 0° pass angle: 600mm (23.6in.)
Scanner Height: 1170mm (46in.)
Weight: 1000kg plus 100kg/m
(2000lbs plus 100lbs per ft)

Maximum Sheet Width
5100mm (200in.)

Scanning Speed
Scanning speed is governed by an inverter assuring smooth operation of the heads. Normal scanning speed is 100-200mm/second (4in./second).

Head Positioning
The heads use web edge detectors to seek out the web and automatically adjust for width and web position changes.

Single-Point Positioning Accuracy
+ 3mm (+ 0.12in.)

Maximum Ambient Temperature
55°C (130 F) standard

Power Requirement
110-230 VAC, 50/60 Hz, 1 kW

Drive Belt
Steel reinforced polyurethane timing belt.

Scanner Drive
120 W AC motor with heavy duty toothwheel gear box.

Guiding system
10 large diameter 80mm (3.15in.) neoprene covered wheels supported by a machined and tempered I-beam.

Instrument Air
6 bars (90psi) oilfree (0.01 μm filter) 100 l/min.

Control strategies - stabilizing the process

Scienta offers basic machine control strategies including Decoupled Weight Control, Dry stock Flow Control and Decoupled Moisture Control. Further controls such as Consistency control and CD controls may be implemented using actuators and sensors as needed. The basic control startegy is a Machine Direction (MD) type of control but Scienta has also implemented many profile control applications. Each machine and process type need to be evaluated for the best control strategy to implement.

Process variable reports include long term trends with Reel, Shift and Day reports in standard format. Connection to existing databases has been done using OPC interfaces and tailored to each customers specific needs.

The reports may be easily changed and adapted to the clients' data gathering needs. Reports may be printed or stored in various standard forms such as Excel and PDF.

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Scienta Oy - The Company

Scienta Oy is a privately held company with headquarters in Kirkkonummi, Finland, in the immediate vicinity of Helsinki. The company was founded 54 years ago and continues to be owned by the Stenius family.

Scienta specializes in tailored measurement and control systems for paper, speciality paper, coated paper, nonwoven and paperboard industries. Apart from high technical standards the Scienta concept entails strong client focus with service minded, practical approach to resolving client specific quality management issues.

Scienta combines long experience with high professional standards, ambition and continuous innovation.

Scienta has clients in over 25 countries on three continents, and a global network of representatives and maintenance personnel providing support.

Scienta's systems are affordable, because they are based on smart engineering, modular structures and open standards - and priced according to true costs as opposed to high fixed cost base.

Clients 1990 - 2009

Ahlstrom Glassfibre Oy, Finland
Ahlstrom Lystil Oy, Finland
Saab Barracuda AB, Sweden
Fiberweb Sweden AB, Sweden
Blixt Industri, Sweden (Södra Cell)
Board and Pack, Russia
CELESA, Spain
CIAT S.A., Spain
CNC International, Thailand
Coramine SA, France
DILO GmbH, Germany
Dongwha, Korea
DURATEX, Brazil
Dynea Overlays Inc, USA
Dyno Mugi, Indonesia
Dynoresin Oy, Finland
EVPA, Turkey
Fiberduk AB, Sweden
Filtros Anoia, Spain
Formica Surface Materials Ltd., UK
Funder GmbH, Austria
Haindl Papier GmbH, Germany
Iggesund Paperboard AB, Sweden
J.W. Suominen Oy, Finland
Kaindl Flooring, Austria
Katepal Oy, Finland
Kiiltoplast Oy, Finland
Kronopol Sp z.o.o. , Poland
Kronospan GmbH, Germany
Masisa, Brazil
Metso Paper, Finland
Maica, Malaysia
MoDo AB, Sweden
Papierfabrik Rieger, Germany
Papelera Silla SA, Spain
Pergo Declam AB, Sweden
Perstorp AB, Sweden
Rauma-Repola Oy, Finland
RexCell Tissue AB, Sweden
Saint Gobain Isover Oy, Finland
Santo A/S, Norway
Scantarp Oy, Finland
Süddekor GmbH, Germany
Sued-West-Chemie, Germany
Tamfelt PMC, Finland
Tervakoski Oy, Finland
UPM-Kymmene, Germany
Vits Systems GmbH, Germany
Voith Paper Fabrics, Sweden
Wilsonart Int'l Inc., USA
Wisapak Oy, Finland
Yinge Paper Company, China

Scienta designs and manufactures online measurement and control (QCS) systems for paper, speciality paper, coated paper and paperboard industries. With 54 years of measurement experience Scienta today serves clients in 25+ countries on three continents.

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