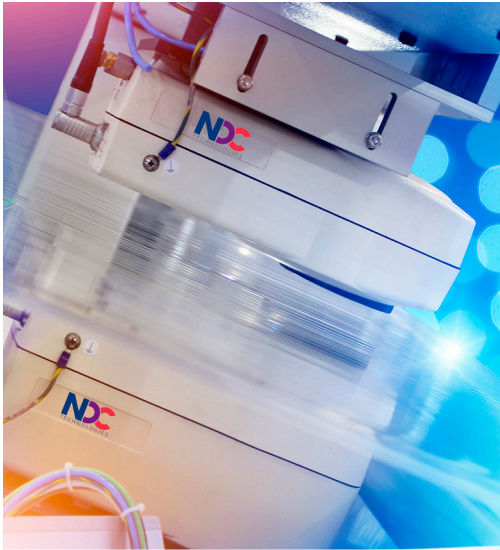
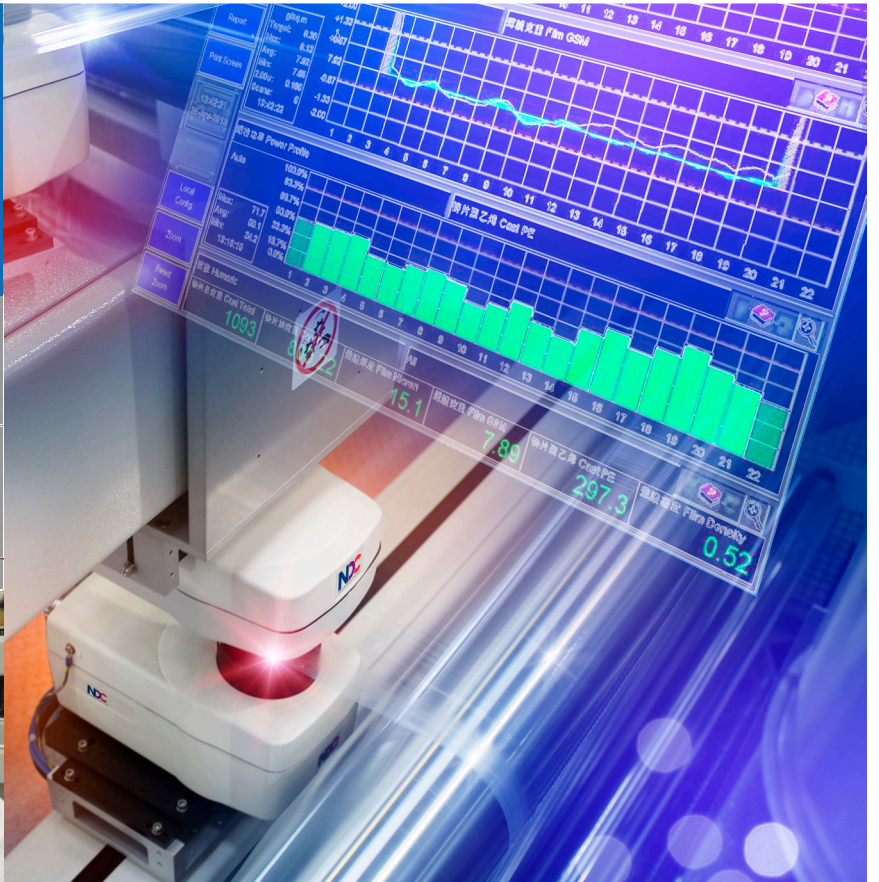


WEB GAUGING AT A GLANCE



Advanced
Web Solutions



NDC Technologies Web Solutions:

Engineered to deliver
outstanding results from your process



- ▶ Extrusion
- ▶ Converting
- ▶ Calendering
- ▶ Nonwovens

Measurements

- ▶ Basis Weight
- ▶ Thickness
- ▶ Coat Weight
- ▶ Barrier Layers
- ▶ Application-Specific Measurements

Controls

- ▶ Machine Direction
- ▶ Advanced Profile Controls
- ▶ Application-Specific Controls

Process Visibility

- ▶ Process Analysis
- ▶ Quality Reporting
- ▶ OPC Integration

NDC's Web Solutions are designed to deliver greater results through measurement, control and process visibility.

NDC's TDi™ (Total Distributed Intelligence) Web Gauging platform is based on a robust industrial architecture that ensures high reliability, low cost of ownership and straightforward installation. The TDi architecture supports intelligent sensors (iSensors™) and scanning frames (iFrames™), with each device running its own compact powerful processor, called the D-BRIC™. This architecture not only supports fast Ethernet communications between the system components, but also provides fast commissioning and remote diagnostics capability.

Customer Benefits:

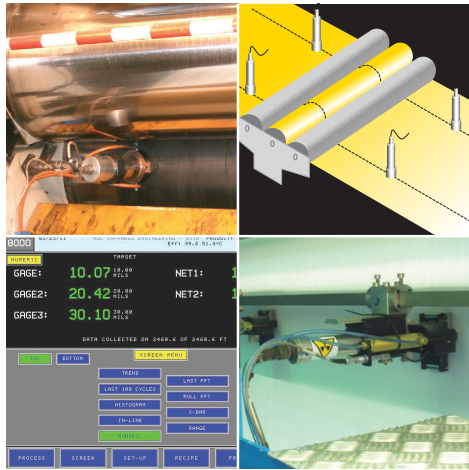
- ▶ Higher quality and productivity
- ▶ Lower manufacturing costs
- ▶ Improved process visibility

NDC's TDi Platform

A reliable, scalable platform

that can be configured for a wide range of applications

NDC's Web Gauging systems are engineered to deliver greater results through measurement, control and process visibility. The flexible TDi architecture means they can be configured for applications ranging from fixed point measurement to multi-scanner systems with complex controls.



8000 TDi Web Gauging System:

- ▶ Web Gauging solutions for the extrusion, converting, calendering and nonwovens industries
- ▶ Common TDi architecture that includes NDC's intelligent sensors and scanning frames

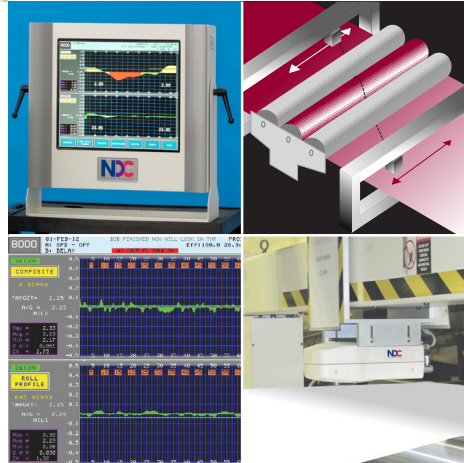


Pro.Net TDi Web Gauging System:

- ▶ The Pro.Net Web gauging system offers expanded measurement, control and information capability
- ▶ Provides the incremental power of an industrial PC running Windows® software.
- ▶ Suitable for large, complex processes, for example for example film orientation lines, tire calenders, multi station coaters and sandpaper lines
- ▶ Supports up to six AccuTrak™ or MiniTrak™ scanners and eighteen sensors
- ▶ User- configurable displays that enable operators to organize essential information on a single screen
- ▶ A cost-effective, expandable system

8000F Fixed-Point Web Gauging System:

- ▶ A cost-effective web gauging system
- ▶ Suitable for a wide range of applications
- ▶ Common TDi architecture with NDC's family of web gauging systems
- ▶ Capable of supporting more than one line
- ▶ Seamless upgrade path to NDC's 8000 TDi scanning systems
- ▶ Supports NDC's GBS, NDC710S, and SR710S sensors
- ▶ Process visibility provided by NDC's MiniFlex™ Operator Work Station (OWS) or a customer-provided PC
- ▶ Compact sensor form factors deliver measurements from restricted process locations
- ▶ No sensor standardization provides continuous process visibility
- ▶ High reliability system with low cost of ownership
- ▶ An efficient, low-cost installation



- ▶ Fast Ethernet communications between all of the system nodes
- ▶ Supports up to three AccuTrak™ or MiniTrak™ scanners and four sensors
- ▶ Extensive library of operator and maintenance displays with NDC's MiniFlex OWS
- ▶ Complete package of available machine direction and advanced profile controls
- ▶ An efficient, low-cost installation

Company overview

Combining industry-best performance and reliability with a global support structure

NDC Technologies, headquartered in Irwindale, California, designs, develops and produces a wide range of process measurement and control instrumentation for a broad scope of manufacturing industries.

NDC has manufacturing facilities in California, Dayton, Ohio and Maldon, UK, with centers of excellence at each of these locations including Loncin, Belgium. In addition, there are direct sales and support facilities in China, Japan, France, Germany and Italy. There is also a highly trained network of Sales and Service distribution channels in more than 60 countries around the world.

NDC Technologies is structured to serve its key industry segments with two distinct business units:

► Food, Bulk and Packaging

In packaging, NDC provides basis weight, thickness, coat weight and moisture measurement and control systems for a diverse array of applications in the converting and film extrusion industries and also provides solutions for customers in nonwovens and calendering.

For the food and bulk industries, NDC delivers both on-line and at-process analyzers for the measurement of key constituents such as moisture, fat, oil and protein. NDC's broad spectrum of measurement solutions are used in the food, chemicals, minerals building materials, pharmaceutical and tobacco industries.

► Cable, Metals and Tubing

In the steel and aluminium industries, NDC offers advanced solutions for the measurement of thickness, width, flatness, edge shape, coatings, and length and speed of sheet and long casted products.

NDC serves the wire, cable, fiber optic, pipe and tube industries with a broad portfolio of on-line and off-line measurement and control solutions for the dimensional monitoring of diameter, ovality, wall thickness, eccentricity, length and speed, and other parameters.



NDC is represented in over 60 countries worldwide. ISO9001:2008 www.ndc.com

spectris

NDC Technologies Inc.

Tel: +1 626 960 3300
Email: info@ndc.com

NDC Technologies Ltd

Tel: +44 1621 852244
Email: enquiries@ndc.com

NDC Technologies sa

Tel: +32 4 239 90 10
Email: sales@ndcinfraed.be

NDC Beta LaserMike

Tel: +1 937 233 9953
Email: sales@betalasermike.com

NDC China

Tel: +86 20 2887 3860
Email: info@ndcinfraed.com.cn

NDC Japan

Tel: +81 3 3255 8157
Email: ndcjapan@ndc.com

NDC Germany

Tel: +49 1801 977112
Email: ndcgermany@ndc.com

NDC Italy

Tel: +39 0331 454 207
Email: ndcitaly@ndc.com

NDC Singapore

Tel: +65 91994120
Email: apacsales@ndc.com

NDC India

Tel: +91 9890800697
Email: ndcindia@ndc.com

In line with its policy of continuous improvement, NDC reserves the right to revise or replace its products or services without prior notice. The information contained in this document may not represent the latest specification and is for indicative purposes only.

Document Number: AN-116-15511-02-2014-10
Date of Issue: May 2015
© NDC Technologies 2015



The Largest Number of Web Gauging Sensors

NDC offers a measurement solution

for the most demanding web gauging applications

NDC's web gauging portfolio includes infrared, beta, x-ray, laser, gamma and optical measurement technologies. These gauges are all supported by the TDi platform, representing the widest range of measurement technologies available for the web gauging business.

Gamma Backscatter



The Gamma Backscatter family provide cost-effective basis weight measurement in a compact form factor.

FG710S Infrared



The FG710S can be used to measure single or multilayer composition for most polymeric film products.

TFG710ER Infrared



The TFG710ER is designed to measure thin biaxially-orientated films and CPE stretch films.

NW710S Infrared



The NW710S employs forward-scatter optics to measure the basis weight and moisture of PP spunbond nonwoven products.

SR710S Infrared



The SR710S is specifically designed to measure thin coatings on metal, foils, metallized papers and plastics.

NDC710S Infrared



The NDC710S sensor provides coat weight and moisture measurement and can discriminate up to six components in a multi-layer coating.

XRT X-Ray Transmission



Provides basis weight or thickness measurement across a wide range of products with minimal safety licensing issues.

XRB X-Ray Backscatter



The XRB sensor offers cost-effective thickness or weight measurement in a compact single-sided form factor.

OptiMike



The OptiMike OM190 optical micrometer projects a beam of light across the apex of the product on a roll to measure thickness.

Laser Transmission



NDC's laser gauges measure thickness via a distance triangulation computation of a laser beam.

Laser Reflection



The reflection laser gauge measures thick products in tight process locations as an alternative to nuclear technologies.

Beta Transmission




NDC's 310 Beta transmission gauges feature a high-efficiency detector and minimized source activity for safety and performance.

Measurement Configurations

NDC's measurement solutions
...by application

SENSOR TECHNOLOGY AND APPLICATION SELECTOR CHART

INDUSTRY	EXTRUSION			CONVERTING				CALENDERING				
	MEASUREMENTS											
	Sheet Thickness	Basis Weight	Voided Film Thickness	Barrier Layer Thickness	Blown Film Thickness	Coat Weight/Coating Thickness	Moisture/Water-based Coating	Lamination Thickness	Clear Coatings on Metallized	Calendered Thickness	Basis Weight	Wire Balance, Position, Count
SENSOR TECHNOLOGY	■	■			■	■				■	■	
Gamma Backscatter	■	■	■	■	■	■	■	■				
IR Transmission												
IR Backscatter						■	■	■				
IR Forward Scatter						■						
IR Reflection								■				
X-Ray Transmission	■	■			■							■
X-Ray Backscatter	■	■								■	■	■
Optical Micrometer	■									■		
Beta Transmission	■	■			■	■				■	■	■
Laser	■									■		

This chart presents the typical sensor technology choices for the measurements indicated.