Nordson
MEASUREMENT & CONTROL

Now with COLOR!

EMPOWERING TRUE PROCESS AND QUALITY CONTROL TODAY AND BEYOND

NDC
TECHNOLOGIES

Series 9

A New Era in Gauging for Dairy Industry Applications

NDC Products

Intelligence that transforms the world.

Maximizing Process Performance and KPIs

Through the Measurement of Moisture, Fat and Protein

For more than 50 years, we have designed and built measurement solutions specifically developed to meet the manufacturing challenges faced by the dairy industry.

Our leading position in process measurement has been achieved by working closely with our customers and developing solutions that meet their needs – for better process insight and quality control. We set the bar in the industry for best-in-class performance with our MM710e on-line dairy gauge and InfraLab e-Series at-line analyzer. Our legacy of innovation continues with the Series 9 gauge.

By solving process-specific application challenges, we play a dominant role in supporting the dairy industry and forging successful relationships with the leading manufacturers.

Today, tens of thousands of Nordson gauges are in service around the globe. That's because we are trusted not just to meet process needs, but to uncover new efficiencies, ensure quality and add value wherever our products are installed.

Stay Ahead with the Series 9 On-Line Gauge

The Only On-Line Sensor on the Market that can Simultaneously Measure Color, Moisture, Fat/Oil, and Protein...Out of the Box

The Series 9 gauge is a best-seller in the dairy industry. It is specially engineered for 24/7 duty, helping manufacturers to meet product quality demands and efficiency goals.

Installed directly on-line, it delivers unparalleled measurement performance while maintaining simplicity and versatility in design and operation. It doesn't require special operator skills or expert knowledge.

The Series 9 can simultaneously measure key constituents such as Moisture, Oil/Fat, Protein and Color in Dairy products. Color can be measured across a wide range of standard scales, including CIELAB (L*, a*, b*), Tristimulus (X, Y Z), RGB, CIELCh (L*, C*, h) ΔE* & ΔEcmc.

Application tests in leading companies have proven that repeatable numeric color readings, combined with other critical measurements such as moisture, fat/oil, and protein, can be confidently used as part of a process control strategy to deliver consistent product quality every time.

Now with COLOR!

Object color
(L*, a*, b*)

The Series 9 Color Gauge keeps you ahead with:

- Evolutionary technology that is flexible, adaptable and scalable to meet your changing needs
- Enterprise-level intelligence compatible with Industry 4.0
- Easier operation and maintenance
- Lower cost of ownership over a long lifetime of operation
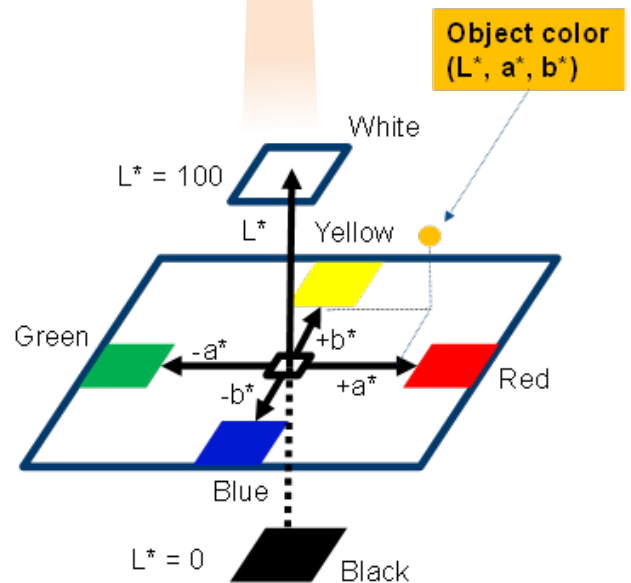
Leverage the Power of At-Line Analysis

The **NEW** InfraLab® Series 9 – benchtop analyzer to the Series 9 on-line gauge – is the latest leading at-line analysis solution on the market. Designed to be used anywhere in the process, the InfraLab Series 9 offers an expanded range of features and capabilities that will help you elevate your quality assurance process. Benefit from rapid, accurate and consistent measurements for a wide variety of dairy applications. Learn more about this powerful analyzer on page 12.

Improve your Process with Immediate and Long-Term Advantages

We understand your process challenges

Consistent product quality

Nordson's NDC Series 9 Gauge provides process measurement solutions for a wide range of dairy and cheese products, helping user to achieve better and more consistent product quality.

A pre-engineered, out-of-the-box solution

Moisture is the key control parameter, as it affects product quality, yield and energy consumption. Real-time, on-line measurement of moisture content of the powder provides reliable feedback, and allows confident operation of the process much closer to the upper specification limit.

On-line measurement of fat and protein content provides monitoring capabilities to ensure right-first-time production. In-process measurement improves visibility of process trends and helps to confirm that product specifications.

The return on investment for such measurements is rapid, through more consistent product yield and optimized usage, with the added benefit of energy savings through optimal operation of the dryers.

We understand your process challenges

Nordson understands your process challenges. That's why we've engineered robustness into our measurement solutions. This ensures that any changes in the measurement output are due solely to varying levels of the measured parameter, without influence from other product or process variables. With immediate access to data, the Series 9 gauge and InfraLab analyzer take you one step further towards maximizing the performance potential of your process.

Operate your process at peak performance with single- or multi-component measurements in applications, such as:

- **Skimmed milk powder** — moisture, protein

- **Lactose powder** — moisture

- **Whey powder** — moisture, protein

- **Full fat dairy powder** — moisture, fat, protein

- **Infant formula** — moisture, fat, protein

- **Casein** — moisture

- **Cheese** — moisture, fat, protein (depending on product)

Refer to the list of applications later in this brochure to see how the Series 9 delivers value to your process.

Engineered with your process in mind

Greater processing power to perform more advanced measurements and gauge operations

- Powerful, dual-core processor with large on-board storage

Unparalleled process vision

- 12 hours of measurement trending and embedded product calibration adjustment tools

Expansive measurement database to meet your needs

- Every Nordson application is fully documented

Hygienic, seamless stainless-steel enclosure with sapphire window

- 316L stainless steel, sealed to IP67

Integrated Air Purge Window shield to keep window clean from process environment

- Advanced window contamination monitoring with an optional air flow monitor

Simple slide-on sensor mounting

Series 9

Integrated Air Purge Window

Removable service backplate

Status indicator light

Innovative removable backplate for easy service and maintenance

- Remove gauge internals while leaving enclosure in place

ATEX certification for safe use in dust hazardous environments

- DUST: II 1 D Ex Ta IIIC T288°C Da Ta -20°C to 50°C and II 2D Ex Tb III C T80°C Db

## Versatile connectivity for flexible integration into production networks

- Ethernet and fieldbus networking with digital and analog connectivity

Easily connect to Series 9 via hand held tablet

- Connect from any location wirelessly or via internet for sampling and configuration

Advanced diagnostics for maximum uptime

- Includes Status indicator light for at-a-glance confirmation with integrated Auto-Check feature for total piece of mind
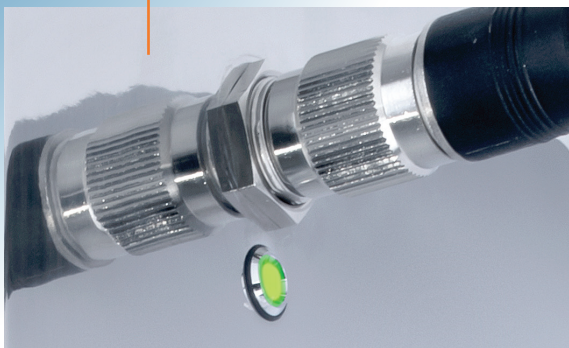
Easy to Install, Integrate and Operate

Connectivity and Interfacing to Enhance Process Insight and Control

A flexible and scalable in-process gauging system for the dairy industry

Gauge Control Interface (GCI)

Series 9 gauge control interface

- 10-inch, touch-screen GCI
- Three Ethernet ports and RJ45 external port
- Interfaces up to 16 gauges
- Multi-lingual interface

OT

OT

OT

PLC

GCI

Connect Series 9 to PLC systems without the need for separate PC

Network up to 16 gauges via a central Ethernet hub or daisy chain
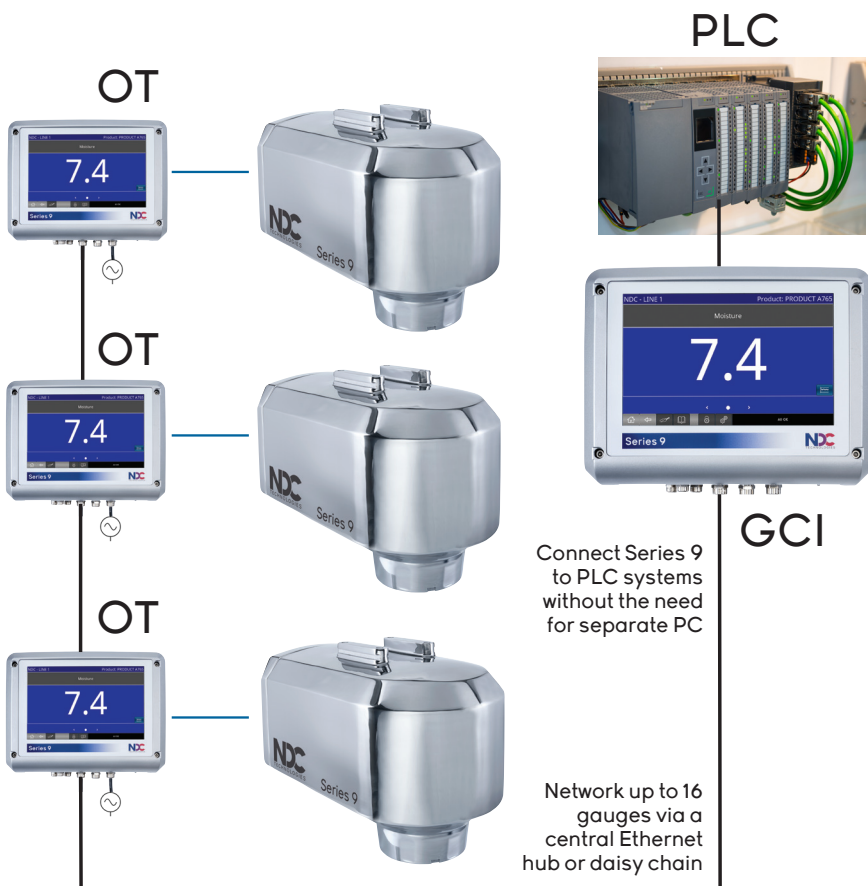
Portable interface

Accessing your Series 9 gauge is even easier with our portable operator terminal. It can be docked in the control room or operated near the gauge (wirelessly or via Ethernet cable) for sampling and configuration.

Series 9 devices

Series 9 peripheral devices all run on 24V DC power and include:

- Operator Terminal
- Gauge Control Interface
- Gauge Control Port
- Power Hub

OT

Operator Terminal
The OT provides 24V DC to a single gauge and operator-level interaction access to its measurement, data trending, sampling and diagnostic functions. Three (3) Ethernet ports are available for convenient networking configurations.

GCI

Gauge Control Interface
The GCI provides 24V DC power to a single gauge. It enables you to perform multi-gauge setup (up to 16 gauges), calibration adjustments and product management. Both the GCI and OT feature high-definition, multi-lingual, color touch-screen displays.

GCP

Gauge Control Port
The GCP provides three (3) Ethernet ports, allowing multiple gauges to be networked (daisy chained). It also has additional options for analog outputs and digital I/O for any connected gauge.

PH

Power Hub
The PH provides 24V DC power to a single gauge. It also enables convenient networked arrangements of multiple Series 9 gauges and devices via three (3) Ethernet ports.

Industry 4.0

Scalable solution to meet your plant configuration

Series 9's flexible building-block architecture enables you to scale Nordson's gauging system to meet current and future site requirements.

- Keep pace with changing demands
- Meet the needs of your plant
- Protect current investment while realizing additional benefits
- Maintain a competitive edge

Fully Engineered to Deliver Accurate, Reliable Measurements

At all critical points in the dairy powder production process

Series 9 Dairy Powder Gauge

Measuring from beneath the sifter

In a gravity-fed duct

Measuring over a conveyor

Atomizer

Spray Dryer

Fluidized Bed

To Storage & Packing

Storage

Hopper

Bagging
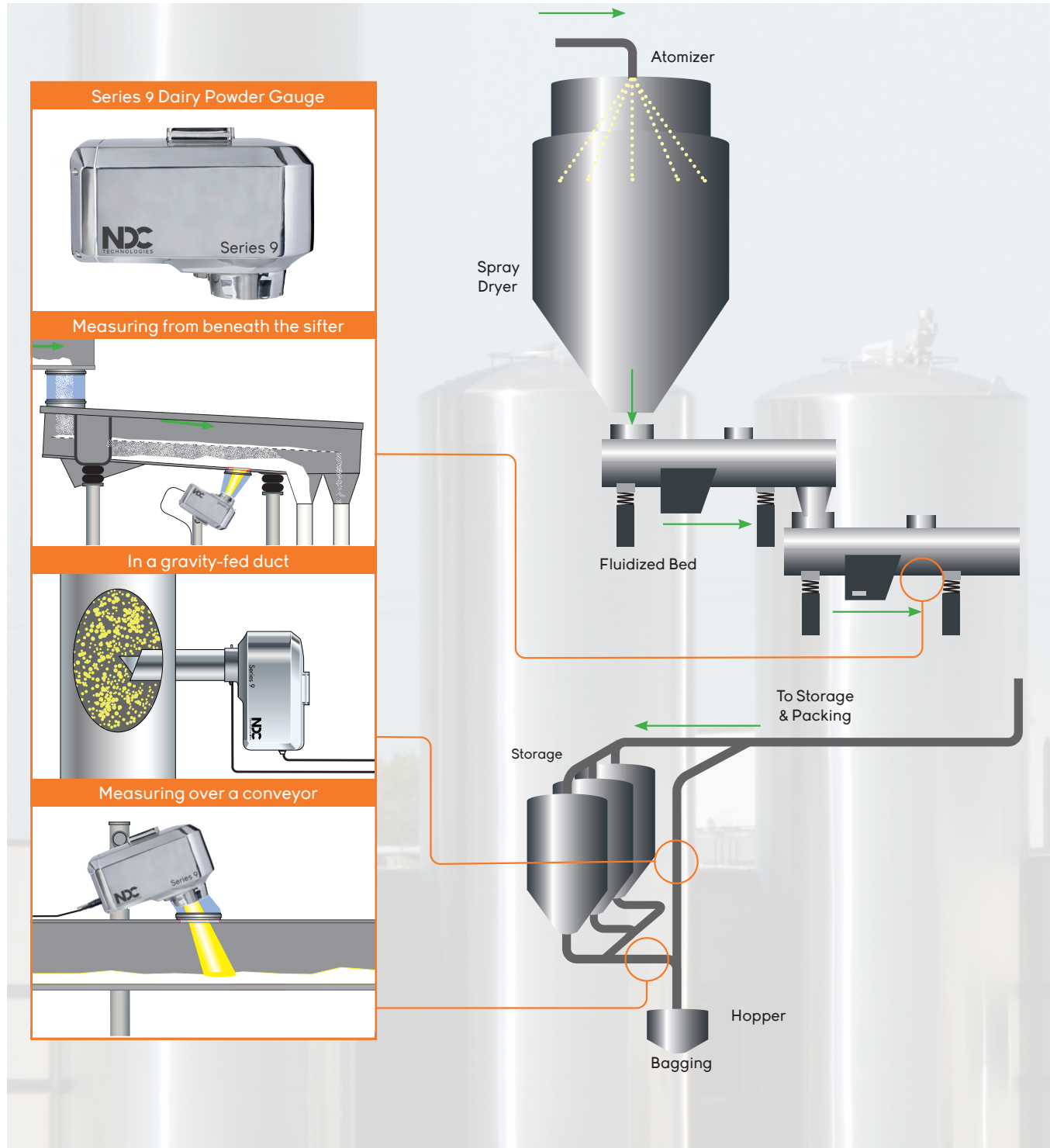
Optimized product presentation at key measurement locations in dairy powder processing

Installation considerations

The Series 9 may be installed in a variety of ways, ensuring that the product is presented to the gauge in order to achieve a reliable measurement. Since the process is virtually completely enclosed, installation often requires the use of an industry standard sight glass constructed of food-safe materials, such as sapphire.

Beneath the sifter

With the gauge measuring face-upwards, a flexible sealing tube between the gauge window and sight glass should be used to prevent excessive powder build-up on the measurement window.

In gravity-fed ducts

The pneumatic PowderVision sampler can be used with the Series 9 gauge for dairy powders transported in enclosed ducts. This device comprises a tube fitting with window and a sample collection cup which fills with the falling product. Once a sample has been collected and measured, a jet of air ejects it and the cycle recommences.

Over a conveyor

The Series 9 measures over a 60 mm diameter area (optionally 25 mm or 10 mm) and is suspended over the process line at a distance of 250 mm from the mean product height to the Series 9 measurement window. The gauge optics tolerate product height fluctuations of ±100 mm without the measurement being affected.

Ready for any process condition

The Series 9's stainless-steel hygienic housing is sealed to IP67 requirements and optionally ATEX certified. Its seamless hygienic design is a must for food industry applications and allows operation in ambient temperatures from 0-50°C without cooling.

For higher ambient temperatures, cooling options using a novel heat exchanger arrangement are available:

- **Vortec air cooling:** with an optional air control solenoid to optimize air consumption and reduce operating cost
- **Water cooling**

TEMPERATURE   DUST   AMBIENT LIGHT   HUMIDITY

Additional technical information sources

For additional technical information about installation, calibration, networking and process connectivity, and to learn more about the Series 9 gauge generally, please consult the manuals.

InfraLab® Family of Analyzers

Fast, Accurate & Easy to Operate – Viable Alternative to Laboratory Methods

NEW InfraLab® Series 9 Top-Loader

Repeatable & Reproducible Results Every Time.

The InfraLab® Series 9 Top-Loader analyzer, is ideal for powders and semi-solid products

Measurement time in less than 5 seconds including simultaneous color (CIELAB) measurements.

Available in single- or multi-component formats, InfraLab is able to simultaneously analyze:

- Moisture
- Fat and Oil
- Protein
- Color (CIELAB, XYZ)

Now with COLOR!

InfraLab Series 9

Nordson

Fast ROI with Lowest OPEX

Example Applications:

- Full Fat Dairy Powder
- Lactose Powder
- Skimmed Milk Powder
- Non-Dairy Creamer
- Infant Formula
- Whey Powder
- Casein
- Cheese Curd
- Cottage Cheese
- Grated Hard Cheese
- Grated Mozzarella
- Cream Cheese
- Yogurt

Full Audit Trail for GMP and Audits Reviews

InfraLab® Series 9

Proven. Cost Effective. Accurate.

The InfraLab® Series 9 dairy analyzer, designed for both at-line and laboratory use, measures samples taken from the process in less than 5 seconds. Available in single- or multi-component formats, InfraLab is able to simultaneously analyze:

- Moisture
- Fat
- Protein

InfraLab is designed as a routine replacement for loss-on-drying, Karl Fischer or gravimetric moisture testing and to replace chemical methods for fat or protein analysis, such as Soxhlet, Weibull-Stoldt or Kjeldahl. Once calibrated to your preferred reference methods using the built-in calibration tools, its key advantages are: speed, minimal sample preparation and the fact that it measures a larger, more representative sample than other techniques.

The InfraLab Series 9 Advantage:

- Advanced high-accuracy, at-line dairy analyzer designed for rapid analyses in process environments

- Direct replacement for time-consuming laboratory analyses or at-line instruments such as loss-on-drying or gravimetric moisture or testing which has inherent operator-dependent repeatability and reproducibility performance issues

- Intuitive to use with user-friendly reporting of measurement values for rapid monitoring of processes

- Reduces the burden on over-stretched QA Laboratory resources

- Enables cross-checking of on-line measurements

- Enables greater processing and measurement capability for deeper process insight, creating new and exciting opportunities for application development

- Significantly reduces your operational expenditure and delivers a strong return-on-investment over the lifetime of operation
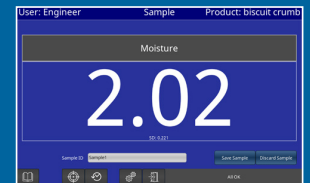
10-inch, high-resolution capacitive touchscreen display

Use encrypted USB sticks (BitLocker) for data download to spreadsheet programs
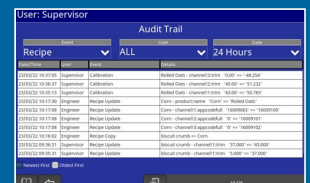
History Audit Log and On-board data storage (up to 10,000 sample measurements)
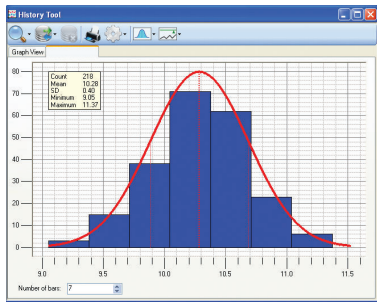
Infralab Manager & Calibration Software
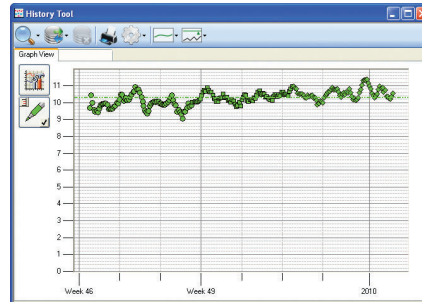
Network connectivity

Optional communications interface for sending measurement data over Ethernet for capture and storage in a centralized database.
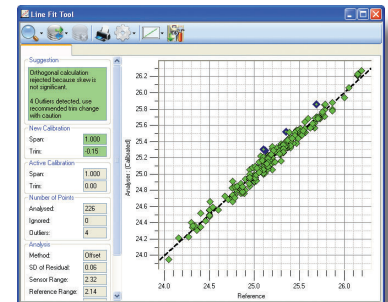

Ethernet

Advanced Data Analysis for Deeper Process Insight

Histogram

Data display

Calibration

With InfraLab Series 9, you realize a greater return on investment by reducing routine sample testing costs.

Integrated Calibration Tools

The Series 9 and InfraLab are delivered with our unique factory calibrations that are ready for use for the specified measurements and ranges. On installation, they are adjusted to agree with your reference method. The software simplifies this process by enabling a comparison of instrument values with laboratory results and features the following tools and functionality:

- Instrument setup and calibration
- Product management (product settings)
- Displays of measurement and other key parameters
- Data logging and export
- Diagnostic functions

Get Unparalleled Performance in the Following Food Applications

Dairy Powder Applications

Product	Moisture	Fat	Protein
Full Fat Dairy Powder	■	■	■
Lactose Powder	■		
Skimmed Milk Powder	■		■
Non-Dairy Creamer	■	■	■
Infant Formula	■	■	■
Whey Powder	■		■
Casein	■		

Dairy Powders can be measured on-line using the Series 9 dairy gauge, or at-line using the InfraLab dairy analyzer.

Measurement Performance

Component	Range and Accuracy	
Moisture	0 – 5%	0.1
	5 – 50%	0.2
	80 – 85%	1.0
Fat	10 – 50%	0.28 – 0.5
	35 – 50 (dry weight)	0.5
Protein	10 – 35%	0.6

The accuracy values exclude sampling and reference method errors and are indicative of the results between the Series 9 on-line measurements and the values obtained for samples taken from the line and tested in an approved reference method in the laboratory. Consult Nordson Measurement & Control for more details.

Cheese Applications

Product	Moisture	Fat	Protein
Cheese Curd	■		
Cottage Cheese	■		
Grated Hard Cheese	■	■	▶
Grated Mozzarella	■	■	▶

These and similar cheeses can be measured at-line only, using the InfraLab dairy analyzer. Fat can also be expressed as % dry weight.

For other applications, please consult our Applications Technical Support group.

Optimizing Your Investment with World-Class Service and Support

Nordson Measurement & Control's technical expertise comes from deep experience supporting thousands of products at the world's leading manufacturers. Our portfolio of support offerings leverages this expertise to assist you through the service
lifecycle. We offer a complete range of cost-effective support solutions including commissioning, training, technical assistance and service agreements. Customers rely on our 24-7 availability via myNDC – the industry's most progressive service cloud portal. Whether it's configuring new equipment, training your technical staff or solving a technical problem, you can count on our experienced team to help maintain the health and performance of your Nordson product.

Visit myNDC service cloud at myndc.com.

NDC Products

Intelligence that transforms the world.