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■ Moisture

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■ Fat

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■ Protein

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# FOODS

# Advanced Applications Engineering

**NDC Applications Engineering** combines in-depth process understanding with robust Near Infrared (NIR) technology to generate a solution which meets your on-line measurement needs...

MM710 FOOD APPLICATIONS				
Sector	Moisture	Fat/Oil	Protein	Products
Biscuits, Cookies & Crackers	■			Biscuits, Cookies, Crackers
Cereals, Flour and Grains	■	■	■	Bran Flakes, Breakfast Cereals, Flour, Semolina, Wholemeal Flour, Soya Flour, Sunflower Meal, Rape seed, Maize Products
Chocolate	■	■		Cocoa Beans, Cocoa Liquor, Cocoa Powder, Drinking Chocolate, Molten Chocolate, Crumb
Confectionery	■	■		Sugar Coatings, Moulding Starch
Coffee & Tea	■		■*	Green Beans, Ground Roast Coffee, Instant Coffee/Tea, Finished Leaf Tea (*Caffeine )
Cheese	■	■	■	Cottage Cheese, Cream Cheese, Mozzarella, Cheddar, Monterey Jack, Hard Cheese
Dairy Products	■	■	■	Casein, Lactose Powder, Milk Powders, Baby Formulae
Sugar	■			Granulated Sugar, Sugar Cubes
Ingredients	■			Flavourings, Herbs and Spices, Yeast
Rice, Noodles & Pasta	■	■		Noodle Blocks, Pasta Dough, Rice
Dried Fruits, Nuts & Seeds	■	■		Nuts, Peanuts, Olive Pulp, Wine Pomace, Dried Fruit
Snacks	■	■		Corn & Potato Based Baked or Fried Snacks, Extruded Snacks, Potato Crisps/Chips, Corn Chips
Pet Foods and Animal Feeds	■			Beet Pulp, Orange Thrash, Whole Grains, Spent Grains, Grass, Lucerne, Alfalfa, Fish and Meat Meal

# On-line Measurement

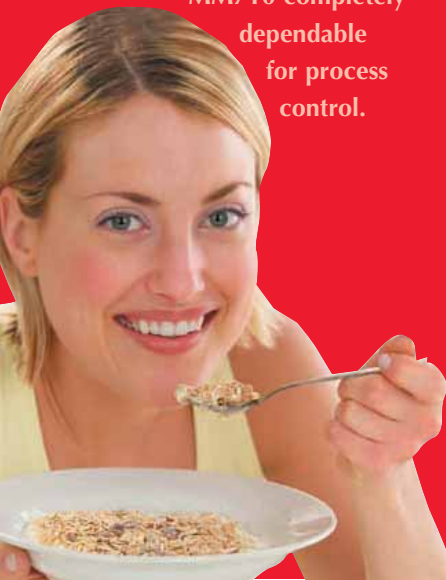
## NDC & the Foods Industry

With over 35 years experience in the development and manufacture of process instrumentation for industry, our philosophy has been to combine leading edge instrument design with the best in applications engineering, complemented by a range of supporting products, to bring the measurement to the process.

We believe that each application or process has special requirements and that only a complete measurement solution can achieve results.

With an on-line measurement pedigree spanning 7 generations of analyzers, the MM710 Gauge has been developed specifically to meet the exacting needs of the Foods industry.

With a database of over 3,000 different applications representing many thousands of data points comparing NDC Gauges to compendial methods, we are certain that the robustness of our measurements makes the MM710 completely dependable for process control.



**The Challenge of Market Demands** Achieving customer loyalty in a competitive supply chain – through product consistency and quality...

### INDUSTRY DRIVERS



- Compliance with foods legislation
- Labelling
- Reducing fossil fuel consumption
- Introduction of GMP
- Implementation of automated closed-loop control systems

### Optimizing Process Performance

to ensure maximum yield and consistent best product quality – and the resultant consumer loyalty – is a key goal of today's foods industry.

### Real-time On-line Measurement

and direct control of critical constituents such as moisture present a real opportunity for foods manufacturers to achieve these goals. Yet the complexity and diversity of foods manufacturing processes require specifically engineered solutions.



### Measuring Moisture, Fat or Protein

in a product transported pneumatically in a ducting system is very different to measuring the same constituents in a product flowing on a conveyor belt.

Extruded products present themselves very differently to, say, a powdered product in a fluid bed drier or at the exit of an atomizer, and discontinuous or fluctuating product flows present other challenges.

Furthermore, the product itself can vary due to seasonal changes and raw material supplies, and due to ambient conditions such as temperature and relative humidity.

### Instrument Design

must incorporate robustness and stability to ensure that changes in the measurement output are due solely to varying levels of the measured parameter and not because of product or process variables.

**We believe that each application or process has special requirements and that only a complete measurement solution can achieve results**

# Engineered for Performance

**Use MM710 to Maximize Process Profitability** Whichever area you want to focus on: product quality, yield, waste reduction, power consumption – MM710 delivers performance which is trusted for process control...

## Lowest Cost of Ownership

NDC Gauges require no routine maintenance. Drift-free performance, active diagnostics and outstanding robustness and reliability mean personnel can concentrate on production rather than the constant checking and re-calibration needed with generic instruments.

## Maximum Flexibility

Food processes must continually evolve to meet market and production demands.

The MM710 range has been developed to give maximum flexibility with economy and is available in a wide range of configurations, ranging from a single Standalone Gauge with its own Operator Interface, to a Multi-Unit System networked to a factory management system.

The MM710 gauge and its peripheral devices are plug-and-play, making expansion or re-arrangement of an existing installation as straightforward and cost-effective as possible.

## Fastest Return on Investment

Our aim is to ensure that you begin to see a return on your investment in NDC from the day the instrument is installed. This is achieved by ensuring our applications engineering meets your specific needs, minimizing start-up time and calibration requirement and giving accurate stable measurements.

## Maximum Process Profitability

However you use MM710's capabilities, its robustness, reliability and stability combine to achieve highly dependable and accurate on-line measurements for effective process control.

## KEY PRODUCT FEATURES



- **Non-contacting NIR technology**
- **Ultimate Long-term Stability**
- **MTBF of better than 10 Years**
- **Insensitive to Within-Product Variations**
- **Not influenced by Environmental Changes**
- **SpeedCal™ Pre-Calibrated**

## MM710: BENEFITS



- **Lowest Cost of Ownership**
- **Maximum Flexibility**
- **Fastest Return on Investment**
- **Maximum Process Profitability**
- **Best Practice Support**

## Best Practice Support

NDC's global Customer Care network offers local solutions to ensure you derive full benefit from your investment over its lifetime. As your company, products and processes develop to meet market demands, NDC's Customer Care Team offers a range of support products and services to help guarantee Best Practice.



# Engineered for the Process

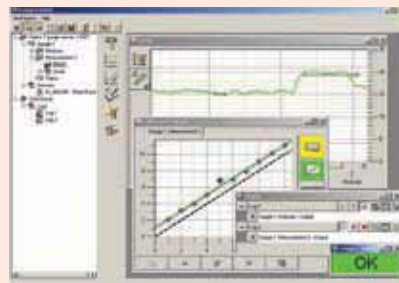
**Sealed to IP65/Nema 4** MM710 is supplied in a robust food-grade housing ready to be fitted with any of NDC's unique range of industry accessories...

## WITH A WIDE RANGE OF OPTIONS



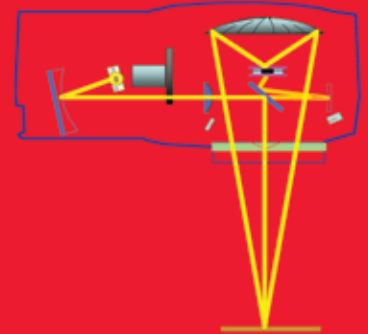
- Single or Multi-Component Sensors
- Wall-mount, Panel-mount or Hand-held Operator Interface
- Auto Reference Standard
- Calibration Check Standards
- IP67 Enclosures
- Gating options for discontinuous process
- Vortex Cooling
- Analogue Outputs
- Digital Connectivity to all common protocols
- PowderVision™ Sampling Systems
- ATEX certified enclosures and hazardous area systems
- GaugeToolsXL™ PC-based Calibration, Product Management, Trending, Logging and Diagnostics Software

GaugeToolsXL™ Software



## How the MM710 works

Light from a QH lamp is split into sequential pulses of NIR energy at wavelengths which are absorbed by the parameter being measured. Before emitting the light on to the product, the MM710 diverts a portion of the beam on to the secondary detector, to form the reference signal against which the returning backscattered light will be compared.



The light leaving the MM710 interacts with the product and unabsorbed energy is reflected back into the instrument, captured on a special 24-segment mirror and focussed onto the primary detector.

The detector signals are then ratioed to generate an output which is proportional and linear to the amount of moisture, fat or protein. The patented optics reject ambient light, RH and ambient temperature influences to provide a highly stable measurement, irrespective of product height fluctuation.

Each Gauge is supplied with NDC's unique SpeedCal™ pre-calibration, leaving our facility ready to be installed in the process and quickly set up to give high performance measurements from day one.

# Technical Specifications

## MM710 Sensor

**Measurements:** up to 4 simultaneously.

**Measurement Range & Accuracy (% Absolute):**

- Moisture: 0 - 90% ( $\pm 0.1$ )\*
- Fat: 0 - 70% ( $\pm 0.25$ )\*
- Protein: 0 - 70% ( $\pm 0.1$ )\*
- \* Application Dependent

**Wavelengths:** 6, 8 or 10 depending on application.

**Operating Distance Sensor to Product:** 150 to 350mm

**Product Measurement Area:** 60mm Diameter (25mm or 10mm optional).

**Response Time:** User selectable from 0.1 to 1,000 seconds, exponential or linear.

**Voltage:** 24V DC (supplied via GaugePort or Operator Interface connected to mains AC supply with universal input 80 to 264V AC 50/60Hz).

**Outputs (via Operator Interface or GaugePort):**

- Scalable analogue output per measurement
- Serial RS232
- Hi/Lo alarms: 1 relay per measurement\*
- Gauge Status Alarm\*
- Active Diagnostics and Window Contamination warning
- \* All contact closures are isolated (1A 240V max)

**Databus Options (others on request):**

- Ethernet TCP/IP, - DeviceNet, - Modbus, - Profibus

**Ambient Operating Temperature:** 0-50 Deg. C (higher with cooling)

**Enclosures:** Sensor housing is stainless steel (5.8kg) with food-grade gaskets and sapphire window. Cast alloy (7.2kg) with glass window also available. Both sealed to IP65. Optional IP67 and ATEX certified housings available.

**Air Purge Window Shield:** (optional) requires clean air supply at 30psi and 75l/min flow rate.

## Operator Interface

Interface: Backlit colour ¼ VGA Touch Screen

User Software: Intuitive "Product Manager" based interface

Multi-lingual (user selectable languages).

**Connectivity:** network options, BCD, also USB and Serial Connections

Installation: wall mounted locally to Gauge or networked up to 2,700m distance.

**Alternative Interface Configurations**

(each with same screen and user interface software):

- Panel Mount Interface
- Hand-held Interface (connects to Gauge Serial port)

## Sample Display Unit (or Batch Averaging Sample Display Unit)

Backlit monochrome LCD alphanumeric display showing up to 4 measurements.

**Power:** supplied from adjacent GaugePort or Operator Interface.

**Data collection:** User-defined delay and sampling periods manually activated via push button or remotely via databus network.

**Outputs:** Display Continuous Measurement, Sample Average over selected time period plus Standard Deviation, or output to network.

**Batch Average Option:** As above but with batch average, Start/Stop. initiated by external signal eg: switch or relay. Outputs batch value also to Serial Printer.

## GaugeToolsXL™ Software

PC based software suite, communicates to MM710 via USB or serial connection on GaugePort or wall-mounted Operator Interface or remotely via a network, to provide full set-up, line-fit calibration, data management, real-time trend views and many other features, designed to optimize the use of the MM710. When networked, can connect to all MM710 units linked to same network. Data logger function allows data storage and extraction into Excel™.

## Electrical & Safety

**Power:** Universal 80-264v AC

**Consumption:** Gauge + Operator Interface 42 Watts

**CE Compliance:** Low Voltage EN61010-1 and EMC EN50081-1 & 50082-2

NDC Infrared Engineering is represented in over 60 countries worldwide

a **spectris** company

[www.ndcinfrared.com](http://www.ndcinfrared.com)

ISO9001:2000

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