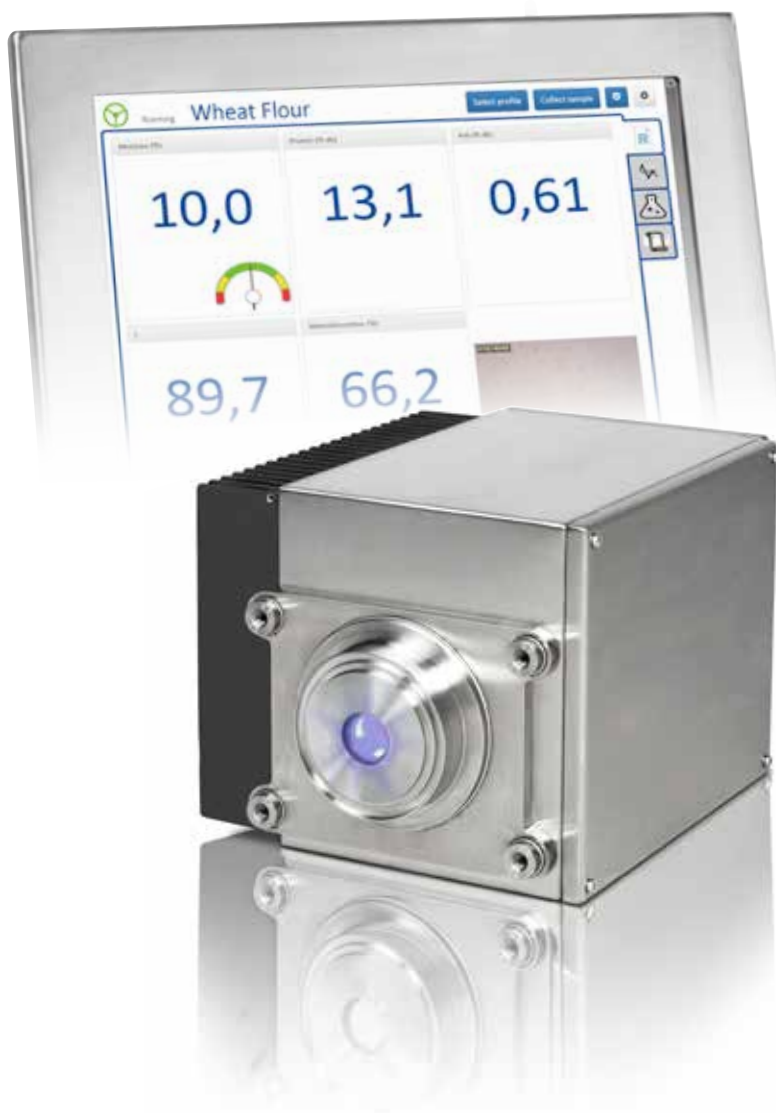


Diode Array 7300

In-line NIR sensor



Continuous Measurement



Automatic Process Control



Reliable Industrial Design



Web-based User Interface

Reliable, Accurate, Real-time Agri and Food Measurement

DA 7300 In-line NIR Sensor

Many food and agricultural processing operations *lose time and money through lack of accurate, timely knowledge of ingredients, production processes, and finished products. While manual sampling and analysis is useful, it takes time and only provides a snapshot at that instance. The DA 7300 In-line NIR sensor provides continuous, simultaneous measurement of parameters such as moisture, protein, fat/oil, ash and much more. This real-time monitoring helps companies worldwide reduce scrap and re-work while improving product consistency and quality.*



Feature and Benefits

Real-time measurements – Monitor, adjust, and optimize your production processes in real-time to save costs, increase yield and improve product consistency.

Industry 4.0 Ready – Web based software for easy operation and maintenance.

Integrated camera gives production insights – Camera applications are available for color measurements and image analysis for speck counting. Display snap-shots of the production at your operator station.

Rugged design to suit production environments – The instrument is designed for the harsh environments of production facilities. It has IP65 ingress protection as well as ATEX and IECEx classifications for installations in potentially explosive environments. It uses diode array based technology which is solid state and resistant to vibrations.

Flexible communication for easy integration – Industry standard, open communications protocols enable fast and simple information integration with existing plant systems.



The Importance of In-Line Monitoring:

– Unknown issues can be the costliest. By monitoring the process 24/7, deviations from optimum are detected quickly and the process can immediately be brought back into specification through automatic or manual adjustment. This in turn reduces wasted materials, re-work, and labor. Additionally, in-line instruments are used to monitor incoming ingredients and blending operations and can help users avoid allowing out-of-spec ingredients from ever entering the process in the first place. Continuous monitoring also provides a complete history of the entire product batch or run.

Applications

Measure granules, pellets, powders, pastes, syrups, flakes, liquids and more. Many options are available for mounting – all designed for specific uses and products. The most commonly measured parameters are moisture, protein, ash, fat/oil, fiber and starch. The DA 7300 can be mounted on pipes, hoppers, conveyors, mixers, at the entrances of a product, at its outputs, before or after dryers, before packaging or at other critical points in the process.

The DA 7300 is installed and used at many agri & food production sites worldwide. These are a few examples of its applications.

Flour Milling – Maximize flour extraction through accurate real-time ash measurements. Blend wheat and flour streams to reach target specification. Optimize gluten addition.

Starch Production and Corn Milling – Save on raw materials and energy by monitoring and controlling the dryer. Ensure constant product quality and higher output by protein control loops and avoiding costly giveaways.

Oilseed Processing – Measure moisture, protein and oil in grain for pricing and binning. Monitor and optimize extraction and drying. Control moisture & fat in mixer. Higher productivity by increasing yield and avoiding faulty batches and rework. Control moisture loss in cooling and additions of molasses/oil.

Dairy Processing – Reduce energy costs when spray drying milk powder by monitoring product moisture in real-time. Minimize grade change-over time and reduce waste; monitor black particles. Optimize the fat /moisture content of butter. The DA 7300 is USDA approved for installation in dairy processing plants.



Integrated Camera



L=81
a=2.5

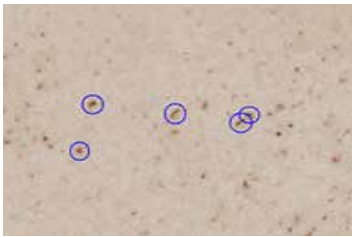
L=84
a=1.5

L=89
a=1

Color measurement

An integrated digital camera performs color measurements. The dedicated lighting provides optimal conditions for

color measurement enabling superior repeatability and better alignment with laboratory methods. The standard color measurement CIE LAB space with RGB and L, a, b is available as well. The example above shows the measurement of semolina.



Speck Count

The DA 7300 includes speck counting as standard, which helps flour millers detect cloth breakages quickly. Specks can be classified

by size and contrast in up to 16 different characterizations. By configuring alarms you can be notified immediately in case speck count exceeds set limits.



Real-time Process View

Users can access real-time images of the process from any networked computer – be it in the next room

or 1,000 kilometers away from the instrument. The images can be incorporated and displayed in real-time. The images provide a unique, real-time view directly into the process stream. Operators can immediately detect presence of foreign material, visible defects, product color, and blockages. The system can be programmed to automatically capture images of the product at various intervals.

Systems Integration

Great importance is placed on connectivity capabilities to existing plant control systems. We support many interfaces including: Fieldbus, Profibus DP, Profinet, Modbus TCP/IP, OPC to PLC (Siemens, Schneider Electric etc.) and more. Benefits of integration in existing plant control systems:

- Measurement information is presented, in operator GUIs, where it's most needed
- Implementation of automatic control loops
- Batch Reports and continuous data archiving for audits, tracking, and tracing purposes

Modern, Intelligent Instrument Software

Internet of Things and Industry 4.0 bring huge benefits, but require that sensors and other equipment are prepared for it. Process Plus is a modern, dedicated web-based process instrumentation software. It is an easy to use software designed with the specific demands of the process industry in mind. The software includes a web-based user interface with both numerical and graphical displays. Process Plus includes features for remote administration and customizations.

12" Touch screen Operator Interface



INSTALLATION EXAMPLES



Wheat Flour Measurement of wheat flour using the optional Flour Measurement Chamber.



Grain Installation at a ship loading facility for continuous measurement of grain.



Corn Gluten Measurement of moisture in corn gluten after drying.



Whole Grain Measurement of wheat in a flour mill using the optional Whole Grains Measurement Chamber.



Butter DA 7300 Sanitary Design version installed in a butter plant. DA 7300 SD can measure slurries and pastes at high pressures.



Feed Measurement of feed pellets in a chain conveyor, for control of fat spraying.

Accurate, Robust, Reliable Calibrations

Perten has a large and diverse library of proven calibrations for raw materials, intermediates and finished goods. Parameters available for monitoring include moisture, protein, fat/oil, ash, starch, fiber, sugars and much more. For instances of customized processes or products where calibrations are unavailable, we provide calibration development services. Our highly trained and experienced Applications Teams help to quickly and efficiently get you instruments up and running.

Additional NIR Models

DA 7440 On-line NIR The DA 7440 can perform the same measurements as the DA 7300, but is designed for over-the-belt type measurements and is suitable in many situations where a product is transported on conveyor belts and similar.



DA 7250 At-line NIR In many situations manual analysis is a good complement to in-line measurements. The DA 7250 measures the same parameters as the DA 7300, is very versatile and analyzes many types of samples in only 6 seconds. Its ease of use and robustness make it highly suitable both for production and lab environments.



Specifications

Power Requirements: 24V DC, 5 A

Dimensions (HxWxD): 220 x 230 x 340 mm (8.75" x 9" x 13.5")

Net Weight: 15 kg (33 lbs.)

Operating Temperature Range: -10 to 40°C, extended temperature range upon request

Ingress Protection: IP65

Measurements: NIR, Digital color camera

Speed of measurement: >20 spectra and measurements per second

Products: Grains, Meals, Flour, Pastes, Pellets, Extruded products, etc

Parameters: Moisture, Protein, Fat/Oil, Ash, Starch, Sugar, Speck count, Color in the CIE L*, a*, b* color space etc

Approvals: CE, Ex II 2/3 D Ex t IIIC T90°C Db/Dc IP6X

Hygiene approvals: USDA Letter of Acceptance for measurements of milk, milk products, meat and poultry products

Communication: OPC over TCP/IP Ethernet, modbus ASCII, analogue output

Data Storage: SSD memory, 60 GB of primary storage

