

# Diode Array 7300

In-Line NIR Measurements



**Benefits:**

- Real Time Analysis
- Process Optimisation
- Increase Yield
- Improved Consistency

# Diode Array – The technology for real-time analysis

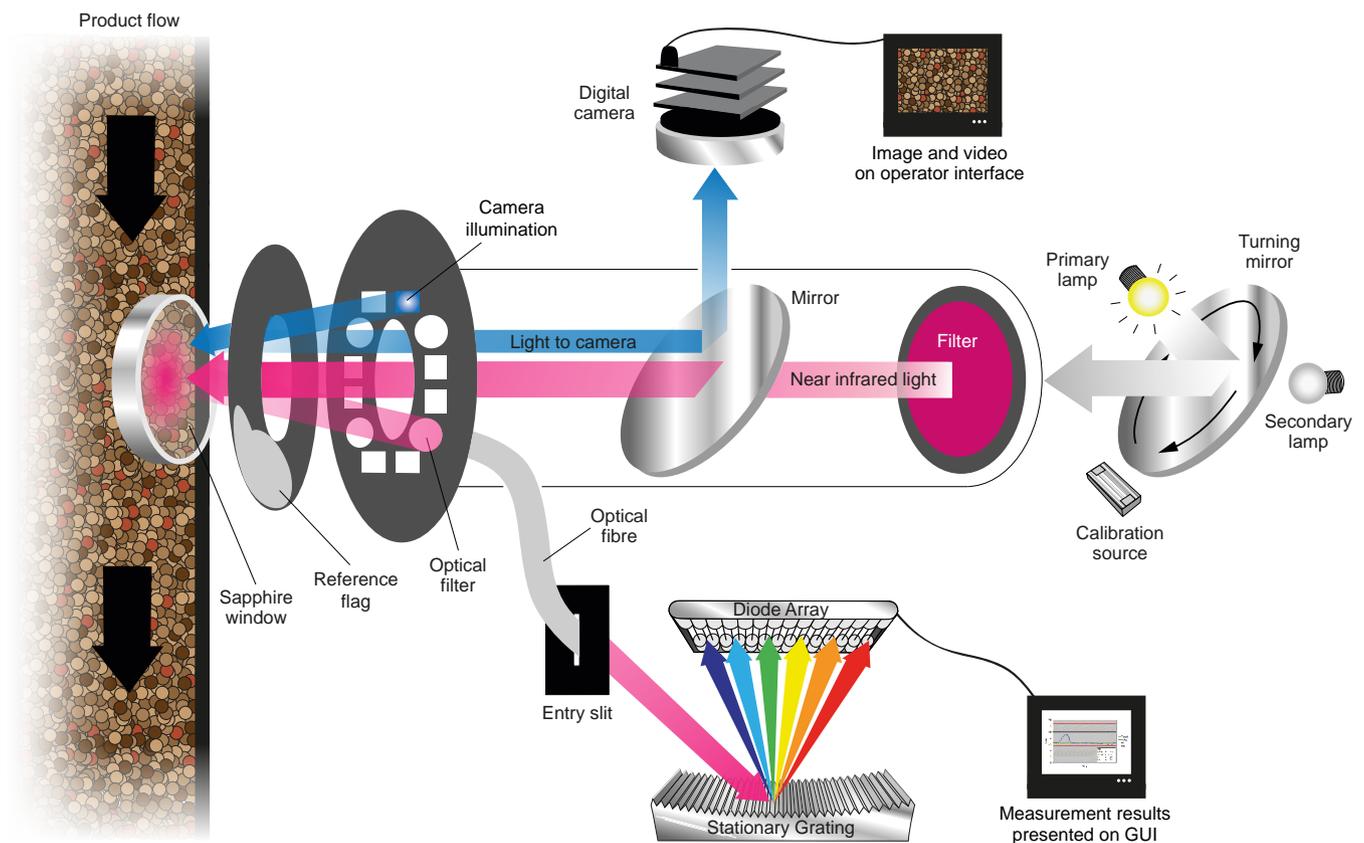
There are many reasons why diode array technology is ideal for process instrumentation. The most important are speed of spectra acquisition, simultaneous wavelength collection, and use of stationary optical components. The speed of spectra acquisition provides real-time analyses enabling immediate, automatic process control or manual intervention. Simultaneous wavelength collection allows for measurements of moving process streams. Stationary optical components are crucial to making rugged, reliable, and accurate process instruments.

The DA 7300 is a rugged instrument built to operate in demanding environments. The instru-

ment is commonly used for measurement and control of operations such as grain segregation at intake, moisture control after driers, fat addition; just a small sampling of its many uses.

The DA 7300 offers many, flexible mounting options providing measurement capability at critical control points. Mount the DA 7300 on the side of a chamber, spout, chute, conveyor, or directly on a pipe, where the moving product is measured. NIR spectra and a product image are captured. Computed results are then passed on to the operator G.U.I. and control system for automatic control, data storage, and reporting.

## DA 7300 – Principles of Operation



## Professional Project Management

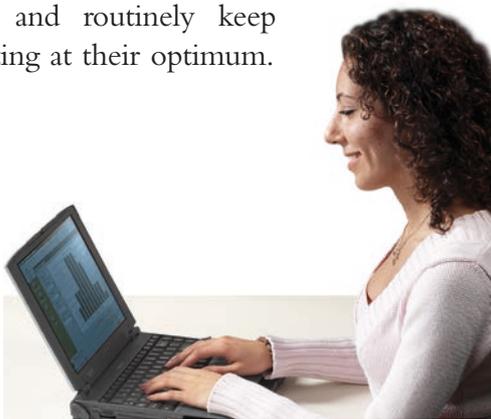
While superior hardware is a must, installation, implementation and support are just as important. Our product specialists are experts in project management. They follow documented protocols and are assigned to your project from the beginning. It is their job to ensure everything goes smoothly and that planning, installing, commissioning, validating and operating the instrument are hassle free.

Our product specialists consider your plant safety and good manufacturing practices as the most important aspect of any successful installation. They are trained in cGMP, plant safety and to work in hazardous locations. Our project management protocol requires our product specialists to provide timely status reports including a project plan with timelines and identified resources. This guarantees customers won't need to guess what's to come. Project success is in the details; details our product specialists master every day.

## Support

We offer a range of support options, including NIRAdmin, preventive maintenance and remote services & diagnostics. We use safe and reliable tools to remotely communicate with your instruments and routinely keep them operating at their optimum.

Calibration performance can be supervised and up-dates may be sent out when required.



## Technical Specifications

**Wavelength Range:** 950 – 1650 nm

**Wavelength Calibration:** dynamically with line source

**Wavelength accuracy:** <0.3 nm

**Wavelength stability:** < 0.2 nm

**Detector:** T.E. cooled, 256 element InGaAs array

**Nominal resolution:** 3.1 nm/diode

**Spectra collection rate:** >50 spectra/s

**Noise:** < 20  $\mu$  AU / 3 s. measurement

**Drift:** < 50  $\mu$  AU / 6 h

**Ambient temperature range:** -10 – 40 °C (14 – 104 F)  
extended temperature range available upon request.

**Grating:** gold-coated stationary grating

**Illumination:** 7 W Halogen lens end bulb, dual lamp system with automatic switch-over for redundancy

**Lamp life time expectance:** <18 months / lamp

**Reference:** internal, fully automated with selectable intervals

**Computer:** Intel Atom, 1,6 GHz, 1 GB RAM, 32 GB SATA SSD internal storage

**Operating system:** Windows XP

**Communication ports:** LAN 10/100 MBIT/s, Serial RS232/485,

**Power Requirements:** 24VDC, 5 A

**Ingress Protection:** IP 65

**Net Weight:** 15 Kg

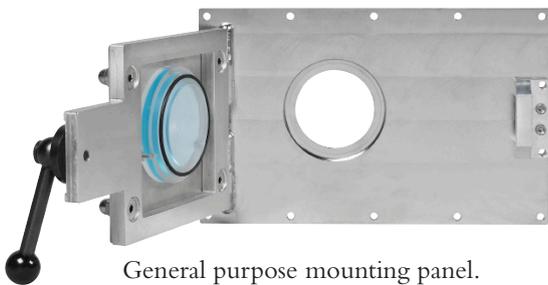
**Sample Presentation:** Contacting

**Static sample measurement area:** 56 mm<sup>2</sup>

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

## Mounting options

A wide variety of mounting options are available – all tailored for a specific product type and measurement situation. The DA 7300 can measure whole grains, powders, pastes, slurries, meals, cakes, liquids and much more. Measurement capabilities include moisture, protein, fat/oil, fiber, starch, sugars and many more. The DA 7300 can be mounted on pipes, chutes, conveyors, vessels, mixers, at in-take, at discharge, pre and post drier, pre-packaging and at many other critical control points in processes.



General purpose mounting panel.

The general purpose mounting panel is used widely for mounting on chain conveyors or chambers/vessels. The mounting panel makes installation simple and is hinged to allow easy access in the event the window requires cleaning.



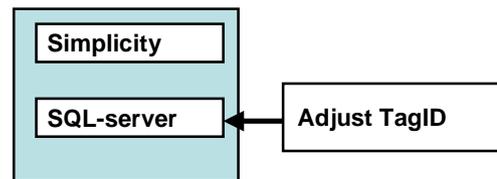
Sanitary pipe section.

Sanitary pipe sections are available for mounting in process stream piping.

Other mounting accessories are available if required.

## Connectivity

A range of connectivity options are available – all designed to make information integration into control systems easy and future proof. Connections can be made through OPC-DA, direct to Perten's SQL database or through a serial Modbus ASCII protocol. Data can be written directly into a PLC memory location for automated controls through an OPC-to-PLC adapter.



SQL-server access configuration.

## Output options

An optional isolated 4–20 mA output is available. This is a pure measurement output for connection into a system I/O.



Rack-mounted analogue I/O.

Additional output options are available on request.

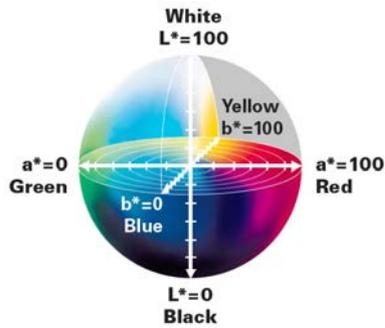


## Built-in Digital Camera

The DA 7300 incorporates a digital camera for real-time video of the process stream as well as color and image analysis. The camera has its own dedicated, controlled illumination for optimal performance – a feature unique to the DA 7300.

## Color measurements

Color measurements are readily made using the digital camera. The dedicated illumination design provides optimal conditions for a color measurement with superior repeatability and agreement with laboratory methods. The standard color measurement is the CIE LAB color space, but other methods such as RGB & L,a,b are available upon request.



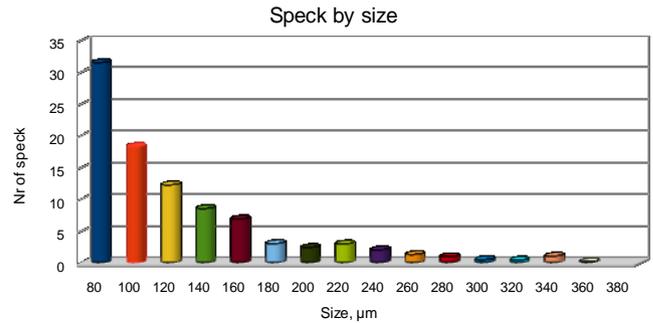
The example below is measurement of semolina. The  $b^*$  value measures the product's yellow hue, a specification parameter when trading durum semolina.



L=81	L=84	L=89
a=2.5	a=1.5	a=1
b=30	b=20	b=9

## Speck count

The DA 7300 includes a feature for speck counting. The system automatically detects dark or bright particles and provides a count of each. Up to 16 classes – based on size and contrast – can be customized and reported.



## Live Video

Video can be accessed from any computer on the same network – be it in the next room or 1,000 miles away – as the instrument. The video may be incorporated as an Active X component in displays or in the live video window of the software. Just like a sight glass on a tank wall, pipe or conveyor, it provides a unique view of the process unavailable in any other way. At a glance, operators can immediately ascertain presence of foreign material, whether particle size is within norm, excessive visual defects, and general status of product color.



## Image Capture

The system can capture product images on a pre-scheduled routine. The images can be reviewed later to confirm proper measurement and processing conditions. The dedicated, intense, illumination provides crisp, clear images taken at fast shutter speeds. The good image quality allows operators to judge visually product characteristics for changes in color or granulation.



Wheat

## Product flow detection

Some processes experience natural stops of the product flow – i.e. after a batch scale or when loading or un-loading trucks and trains. In these cases, measurements taken during the stoppage are omitted from analysis. The camera system automatically detects product flow and suspends measurement until product begins to flow again.



Mechanically Separated Chicken (MSC)



Soybean meal



Feed Pellets

# Perten Instruments Group

Perten Instruments prides itself on building high quality, easy-to-use, reliable, and accurate routine analyzers. We are specialists in the quality control of grain, flour, food and feed and will remain in the forefront by continuously developing and introducing new applications and instruments serving the needs of our customers.

All business and service are local thanks to our worldwide organization. We have sales offices and representatives in more than 100 countries.

For more information, please visit the Perten Instruments website.

