

In-Process Food Compositional Analysis – Process NIR Sensors



In-Process quality measurements is gaining increasing popularity. No wonder, ever increasing raw material prices, tight margins, capacity limitations in combination with larger production units, means making the most out of your raw material is more important than ever.

Traditionally, manufacturers would take samples from production lines to determine quality traits and adjust processes accordingly. Whilst this time-consuming process was better than nothing, it did help a little to control the manufacturing process in real time. Measuring parameters such as moisture, fat, protein, ash etc. is key in order to optimise the use of the raw material and squeeze out that extra bit of profitability. Over an entire production run that can make small numbers large.

Using in-line instrumentation to measure these parameters in real time can speed up these production adjustments and rapidly improve product quality and bottom line.

Performance of modern in-line sensors equal or surpass that of laboratory methods, yielding results with higher precision in real time for continuous automated control. This enables manufacturers to significantly reduce variability in production. With smaller variations, one can drive product specifications closer to the permissible limits, save on energy for drying processes, potentially increase production rate and optimise the use of raw materials.



Sensor measuring soybeans



Sensor scanning crackers

Since early 1990's, we have offered in-line instruments that enable our customers to optimise their processing and thereby increase profitability by: increasing yield, reducing waste or customer rejects and improving raw material usage.

Most commonly, these inline instruments are used to control drying, control stream blending, control additions, segregate different fractions and monitor product quality.

PerkinElmer offers different types of process sensors for compositional analysis providing readings of moisture, protein, fat content and more, on a diverse range of food.

DA 7350

The DA 7350 measures parameters in direct contact with the product and is designed to measure bulk products, pastes and slurries. This model also includes a built-in camera allowing flow visualisation and colour measurements. Common applications include grain, flour, food and feed processing.

Some examples of applications are:

- Control blending of wheat streams to optimise protein content before milling
- Optimise moisture in butter to save on butter fat
- Optimise ash content in flour production
- Control the separation of gluten and starch during milling and thereby optimise yield
- Segregate high and low fat meat fractions in mechanical separated meats to enable differentiated pricing of end product

DA 7440

DA 7440 is an "On-Line" NIR instrument. It measures a product on a conveyor belt or similar transportation system. The real time measurement enables users to automatically or manually control the process.

Some examples include:

- Control flavouring-salt addition to snack foods to save on expensive ingredients,
- Control milling of sugar canes to optimise of the mill settings and increase yield,
- Scanning of fish meal to monitor moisture, protein and fat content
- Monitor moisture, protein and fat in petfood production
- Moisture control in noodles and couscous production



DA 7440



DA 7350

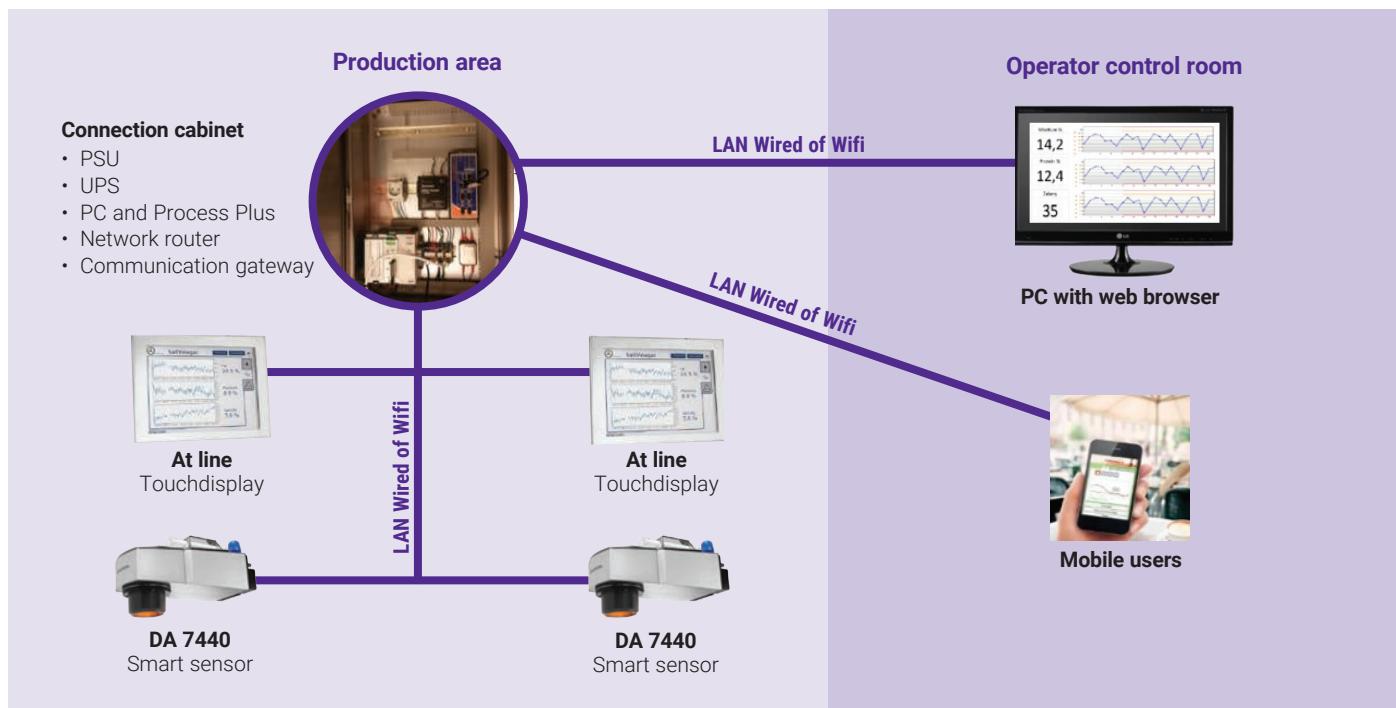


Figure 1: A schematic of capabilities for an in-line NIR system setup

Both systems can communicate with popular SCADA and PLC systems, they have connectivity to your local network by LAN or WLAN, and optional touchscreen for User Interface at line.

The software interface, called Process Plus, is a browser based user-friendly Interface, it can be accessed, with the corresponding level of access, by the operator, the control room, the laboratory or quality manager. It can display up to 20 parameters, results are colour code in case any is outside specification, it also has a control chart graphical interface to observe trends, targets, limits. The software can detect if the product is moving or if is not present and provides an alarm signal ignoring those readings in the measurements.

We have a range of existing Calibrations or can help you develop your own.

An additional advantage on these systems is that the calibrations can be used on the benchtop version NIR DA 7250 that could be used at line or in the lab.



User interface for In-Line NIR on site