



## NIR Systems



Precision in Real-Time



NIR Systems

## NIR Systems for Industrial Use

NIR spectroscopy is a non-contact measuring technique by which information on the material can be directly obtained from any process based on organic material. It allows both qualitative as well as quantitative analysis of the product stream. Blend uniformity or analysis of ingredients like moisture, fat, and others are typical examples. Results are rapidly available, and no sample preparation is needed.

As a reliable and robust tool for Process Analytical Technology, it is nowadays used directly in process environments, allowing a 100% control of the process in real-time. The risk of out-of-specification production is reduced, and the process itself is optimized with respect to higher yield and less waste. Hence, NIR spectroscopy provides a significant contribution to process safety.



## Efficient in Process

NIR spectroscopy gives access to applications of either continuous or batch manufacturing processes. The tec5 system concept makes use of fiber-optic technology, enabling liquid, gaseous and solid goods to be measured. Probes for common sample presentations like goods in pipelines or on conveyor belts are provided.

The tec5 system concept therefore meets requirements for fast and flexible adaptation to the process environment, enabling easy and risk-free integration of systems and components into the process. A high availability with nearly no or significantly reduced downtime of the manufacturing line is guaranteed.



## Versatile System Standards

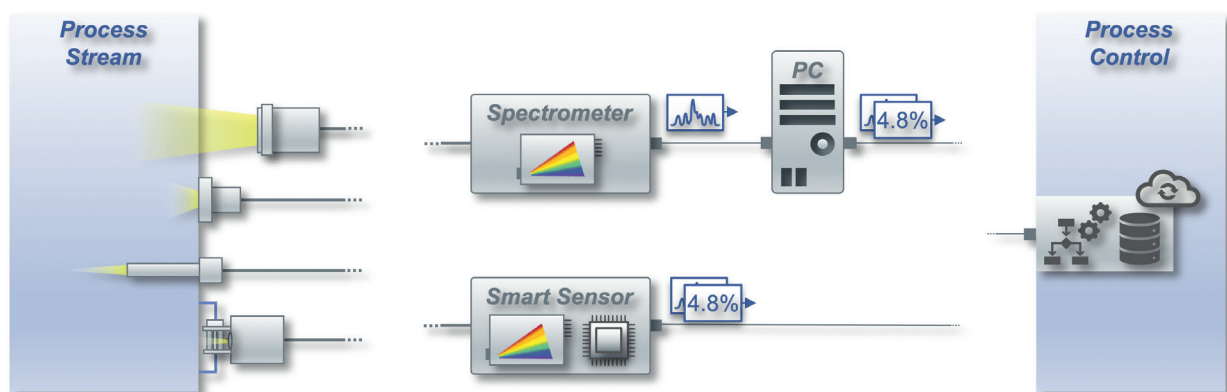
tec5 offers ruggedized NIR spectrometer systems based on diode array technology, covering standard spectral ranges.

The interface to the process is realized by immersion probes, contact sensor heads, and flow cells e.g., for direct integration into the pipeline or by non-contact sensor heads for working distances from 15 cm up to 50 cm for e.g., conveyor belt or web measurements.

Multichannel operation, i.e., the combination of up to 8 probes with one spectrometer system, is available as upgrade option.

As part of our family of spectrometer systems, both PC-based as well as smart sensor devices are available as a standard. In particular, the smart sensor devices allow autonomous operation in the context of Industry 4.0 installations.

## Modular Concept – for both the PC-based and the Smart Sensor Lines



### Sensor Heads & Probes

- Innovative measuring heads
- Process immersion probes
- Flow cells

### Spectrometer or Smart Sensor

- 960 nm – 2200 nm
- TE-cooled InGaAs detector
- High sensitivity and optical resolution

### Process-Interface

- Bus systems e.g., Profibus DP
- Digital and analog I/O e.g., OPC, OPC-UA, 4-20 mA

## Interfaces and Non-functional Features

tec5's NIR spectrometer systems allow the real-time determination of process-critical parameters. They make use of established hard- and software interfaces for onward transfer to the process control.

Furthermore, our systems can be offered in compliance with guidelines such as ATEX or for hygienic design.

For harsh process environments, various housing concepts are available which fulfill IP ratings and also offer cooling options (vortex cooling).

As part of modern Process Analytical Technology, tec5's proven NIR system concept can be integrated easily, rapidly, and reliably into any process environment.



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