Process spectroscopy

With the help of this electronic platform it is possible to upgrade almost any spectroscopic module to a freely programmable, automated process spectrometer with a fieldbus interface.

Modern integration concept

All computational operations from the pre-processing of the measurement data to the real-time application of chemometric models run on system level. A PC is only required for model development. The spectrometer then works in a net-worked, intelligent and autonomous manner.

The device has an integrated PLC for the control of multiplexers and linear axes, the pre-selection of measurement methods or the implementation of project-specific control processes.

The spectrometer communicates directly with your process control system via digital standard protocols of the process industry. OPC UA, Modbus TCP and CANopen are implemented on the hard- and software level. Other fieldbus standards are provided via gateways.

Spectro-PLC

- Programmable logic controller (PLC) for spectroscopic applications
- Internal interfaces for the control of any spectroscopic modules
- Industrial fieldbus interfaces for communication with higher-level controllers
- Spectra calculation and chemometrics on system level

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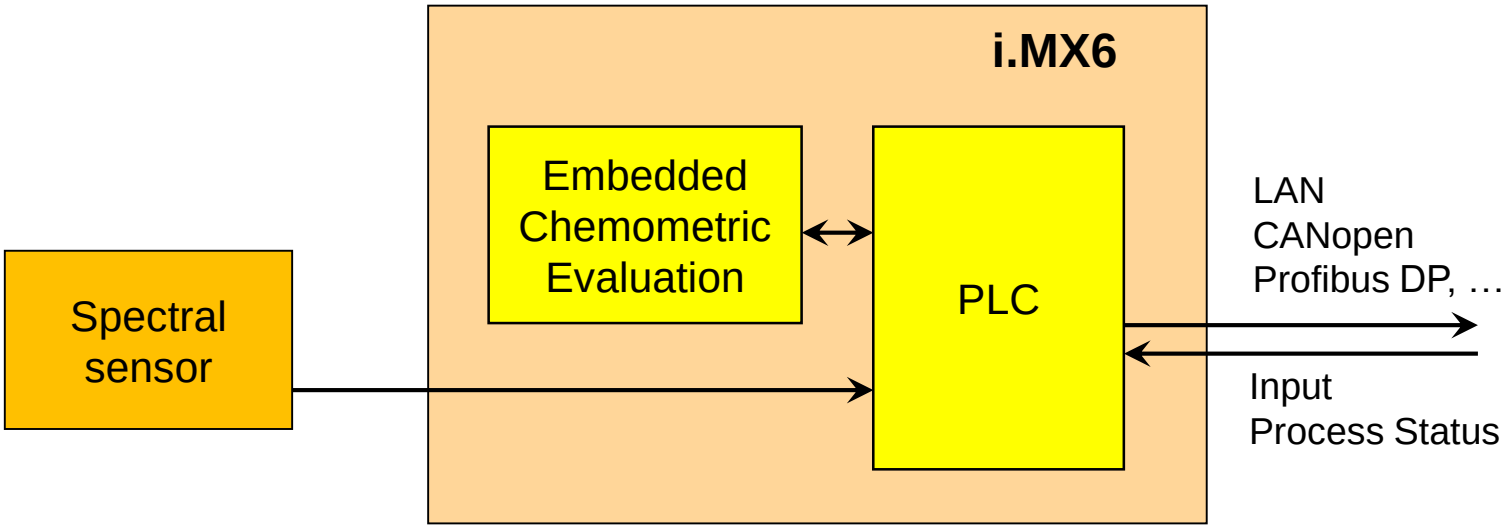
System Integration Concept



Integration concept:

- Measurement of spectral data
- Interpretation of spectral data, chemometrics
- Programmable logic control functionality (PLC)

on a single hardware / software platform

Interfaces:

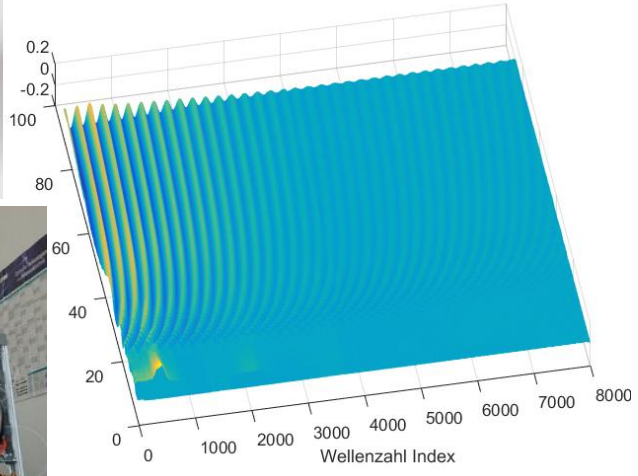
- LAN, USB, SPI, I^2C, CANopen, Modbus TCP, other fieldbuses via gateways for combined integration of process sensors (e.g. other spectral sensors, pressure, temperature, pH) and switches
- Graphical user interface (GUI)
- Remote control and maintenance functionality

Technical Specifications

Processor	ARM® Cortex™-A9 i.MX6
Operating system	Linux
Power supply circuit board	Preparation of all system voltages including protection against reverse polarity, overvoltage, etc.
Internal interfaces	USB, SPI and I²C for connection to sensor modules; FPGA for the implementation of complex interface concepts
External interfaces	TCP/IP for high-speed data transmission and remote control CANopen for real-time data transmission, other fieldbuses via gateway (Profibus DP, Profinet, EtherCAT, EtherNet / IP, DeviceNet, etc.) OPC UA and Modbus TCP for integration into higher-level control systems Digital I/O, 4..20 mA
Programming environment	Optimized for the implementation of spectroscopic systems, the automated control of sensor modules, and the programming of complex measurement processes.
Software platform	Integrated PLC functionality enabling automated measurement applications Freely programmable real-time chemometric evaluation engine User specific and platform independent visualization of measurement results
Remote support	Direct network implementation allows remote diagnostics and remote maintenance
Miniaturization	2 x European format 100 x 160 mm sandwich
Power supply	24 V DC

Service & Support

- **Analysis of your production process**
  How can you get more quality information in real time at critical points in your manufacturing process?
- **Feasibility studies**
  Preliminary examinations in the lab, pilot plant or time-limited test operation in your production plant
- **Hardware**
  Spectrometers (UV/VIS, FTNIR, FTIR, Raman)
  Light sources, optical fibers, probes
  Development of specific hardware
- **Software**
  Automation, communication, visualization
- **Chemometrics**
  Multivariate data analysis & modeling
  AI for automated model optimisation
- **Support**
  Maintenance of hardware and software
  Professional personnel training
  Availability: 24h a day / 7 days per week



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