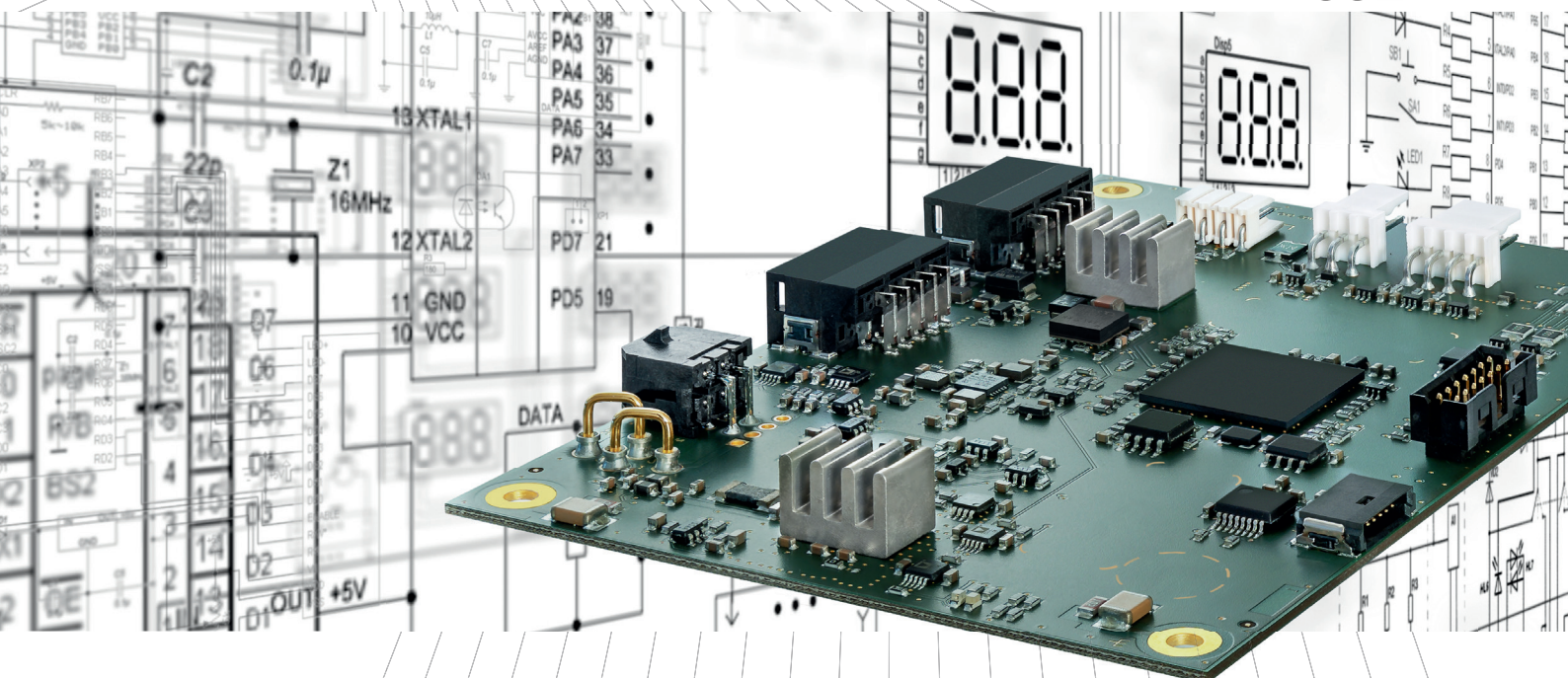


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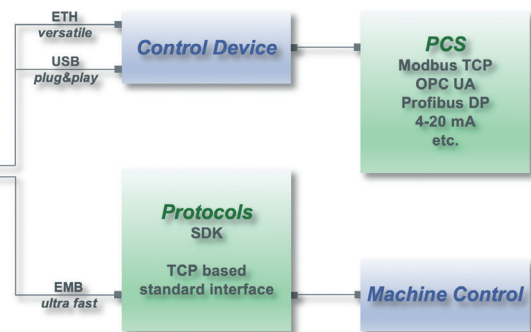
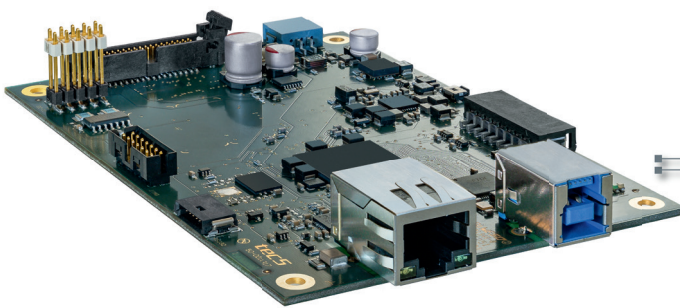


**Smart Spectrometer Electronics for Advanced Sensor Operations  
Designed for Diode Array Spectrometer Manufacturers**

## Short Time-to-Market

The Smart Spectrometer Electronics board family is a dedicated platform for diode array spectroscopy manufacturers. With its outstanding cutting-edge analog and digital signal processing capabilities it allows easy and straight-forward integration of state-of-the-art electronics. High flexibility is the key: Using suitable parameterization and without additional development effort, it is easy to implement your own spectrometer concepts.

Combined with a unique modularity, custom spectrometer designs are brought to market maturity within as little time as possible. Here, the user will benefit from the possibility of working out his individual USPs. Concepts such as smart sensors, i.e., completely autonomous systems, can also easily be introduced. Therefore, short time-to-market even for custom made versions through modular design is possible.



## Modular Concept

With the Smart Spectrometer Electronics platform, different versions of one board like different sensor boards (SB) can be controlled in the same way. Up to four sensor boards

can be attached to the main board (MB) and supplemented by additional modules like temperature control board (TCB), light control board (LCB), and power supply board (PSB).

## Modules and Functions:

### MB – Main Board

The main board acts as the key control unit for all other modules and enables comprehensive data pre-processing and analysis. The connection to a machine controller or a PC can be made either at protocol level, via SDKs or the Modbus interface. For multi-channel systems, parallel real-time operation of up to four sensor boards with one main board is possible.

### TCB – Temperature Control Board

The Temperature Control Board is optionally provided for the operation of thermoelectrically stabilized detectors.

### LCB – Light Control Board

The optional Light Control Board permits active control of tungsten halogen, deuterium, Xe-flash or laser light sources as well as further peripherals

### SB – Sensor Board

A variety of dedicated sensor boards are available for all common detectors. The A/D converter is located close to the detector to increase EMC safety and allows a conversion depth of up to 24 bits.

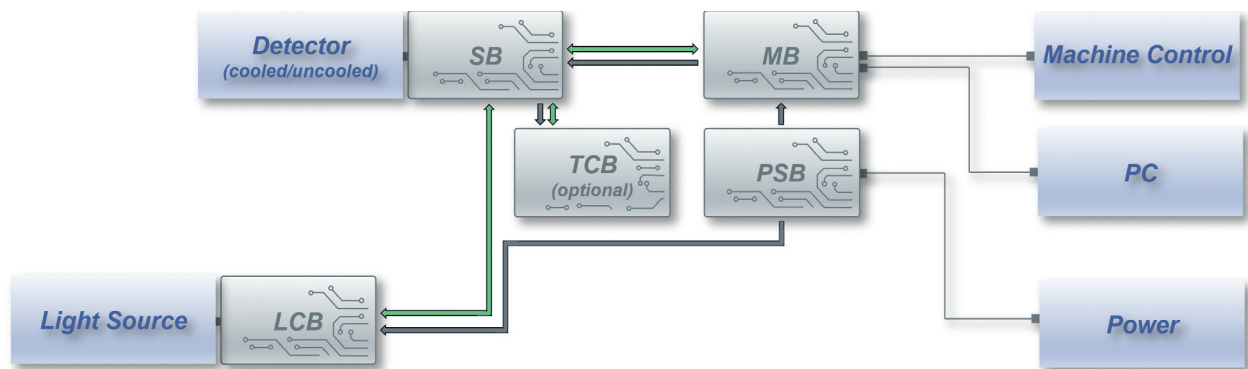
### PSB – Power Supply Board

Power supply boards for both 10-30 VDC and 110-240 VAC ensure a stabilized and filtered power supply for the system regardless of the quality of the input voltage.

## Main Features

The Smart Spectrometer Electronics platform supports functions for self-diagnostics and is ready for future predictive maintenance routines, a pre-requisite for standalone Smart Sensors. The MB provides a logic for status data evaluation, and a second on-board core with Peta Linux allowing full data pre-processing and chemometrics or neuronal network calculations. It can host e.g., Python or R scripts. The SB with its digital and serial interfaces for external devices

provides data for system status information or recording sample or environmental conditions delivering data for advanced spectra evaluation. Currently data rates up to 250 and 500 Mbit/s are supported. With the variable ADCs, performance is scalable, i.e., a compromise between speed and conversation depth can be chosen/optimized as needed: With 16bit ADC the system is optimized for speed (up to 15 MSp/s, with 24bit it is optimized for conversation depth (up to 1 MSp/s).



### Interfaces:

- Data: I²C EC-I/O (electronic control interface)
- Power supply
- External interfacing

## Optimized in Every Respect

Users of the tec5's Smart Spectrometer Electronics platform will benefit from an optimized bill of materials: Common parts across all modules reduce component diversity, lead to a general material availability and guarantee a proper supply chain planning with an optimized cost structure. For the components, drop-in replacements are available.

Standardized module and interface concepts, which can be perfectly tailored to the respective needs, allow for fast and easy configuration without requiring time-consuming development. High-quality, and high-performance components will meet the latest technical standards.

Any high-level module (MB, SB, ...) can be combined with additional modules (16-to 24-bit, Halogen/Laser, ...).

Besides the mere assembly of components, this platform allows additional global features like predictive maintenance, etc. The components can be addressed either machine controlled by or PC, enabling the straightforward design of autonomous Smart Sensor concepts.

tec5 – your reliable partner for the long-term supply of state-of-the-art spectroscopy components for system integration and OEM.

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