

Case Study

Non-contact sensing transforms temperature-critical assay performance

Company

Tecan

Industry

Life sciences research and diagnostics

Products

Exergen IRT/c non-contact infrared temperature sensors from CleverIR

Microplates are laboratory tools with multiple wells used for simultaneous testing of samples in drug discovery, diagnostics and research applications. Tecan's Spark 20M microplate reader represents the pinnacle of bench-top detection technology, offering researchers unprecedented flexibility across all detection modes including absorbance, fluorescence and luminescence. The instrument's modular architecture allows configuration to match specific budget and detection demands, making it ideal for both individual researchers and high-throughput service providers in biopharmaceuticals and life sciences.

Challenges

Temperature-sensitive assays like AlphaScreen® require precise control within narrow temperature ranges to ensure accurate results. Traditional microplate readers control temperature indirectly by managing ambient conditions and heating plates, but this approach lacks the precision needed for individual sample monitoring. Tecan needed a way to measure the exact temperature of liquid samples in each well separately, detect fluctuations quickly and apply corrections without contaminating samples or obstructing the instrument's moving components.



Solutions

Tecan integrated Exergen IRt/c non-contact infrared sensors into the Spark 20M to monitor individual well temperatures during assays. Positioned above each well, the sensor measures liquid temperature with 0.1°C accuracy and detects temperature gradients across the microplate. The non-contact design eliminates sample contamination while allowing unrestricted movement of the instrument's components. CleverIR worked closely with Tecan to develop customized electronics that enable wireless sensor data transmission, seamlessly integrating temperature monitoring into the reader's control systems.

Benefits

The self-powered IRt/c sensors deliver exceptional accuracy with a repeatability error of just 0.01°C and resolution of approximately 0.0001°C. This precision enables an ingenious temperature correction function that ensures more reliable assay results across demanding applications in research and diagnostics. Real-time monitoring allows operators to verify that samples remain within prescribed temperature ranges, reducing test failures and improving laboratory efficiency. The intrinsically safe sensors require no external power and maintain stable performance without drift, eliminating the need for periodic recalibration in the field.



Real-time temperature monitoring reduces assay failures while maximizing throughput for high-volume operations.

Results

The Spark 20M now delivers two critical advantages that strengthen Tecan's competitive position. First, quality improvements from precise temperature control reduce assay failures, directly increasing laboratory revenues and profitability. Second, speed gains come from real-time monitoring that minimizes idle time between assays requiring different temperatures. By instantly detecting when set points are reached, the system maximizes throughput for high-volume operations. Researchers and service providers benefit from configurable detection modes backed by reliable temperature management throughout every measurement cycle.

Conclusion

Tecan's integration of Exergen sensors demonstrates how precision thermal management elevates microplate reader performance for temperature-critical applications. The non-contact technology solved the dual challenge of accuracy and non-interference, enabling individual well monitoring without compromising system operation. The maintenance-free sensors deliver long-term stability across diverse research and diagnostic workflows. This collaboration showcases how advanced sensor solutions can transform laboratory instrument capabilities, supporting more reliable results in biopharmaceutical development and clinical diagnostics.

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