

High-Speed Inline Precision for Maximum Electrode Quality

The AIT Electrode Inspector sets new standards in quality assurance for modern battery production. As a powerful inline inspection system, it enables complete inspection of electrode surfaces directly within the ongoing production process, without any loss of speed and with maximum detection accuracy. Even the smallest defects starting at 10 µm are reliably detected, analyzed, and evaluated, ensuring consistent 100% quality control.

Thanks to advanced optical sensor technology and intelligent evaluation algorithms, the system captures even the finest topographical deviations on the material surface. Typical defect patterns such as scratches, creases, pinholes, coating gaps, or protrusions are identified in real time and automatically classified. This enables not only the immediate removal of defective material but also precise traceability and sustainable process optimization.



The AIT Electrode Inspector is designed for high-speed applications and achieves reliable inspection performance even at the highest production speeds. Measurement accuracy remains consistently at the highest level throughout. Seamless communication with higher-level control systems such as PLCs, along with complete logging of all inspection data, ensures maximum transparency and easy integration into existing production environments.

Thanks to the modular design of the sensor system, the solution can be flexibly adapted to different roll widths and specific requirements. Extensions such as deep learning-based defect classification open up additional potential for automated quality assessment and continuous improvement of production processes. In addition, optical measurement of coated battery electrodes enables comprehensive analysis of relevant production parameters.

With its combination of precision, speed, and intelligent data processing, the AIT Electrode Inspector is a key building block for efficient, scalable, and future-proof battery production, providing the data foundation for the highest product quality and maximum process reliability.

Technical Highlights & Benefits

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| Surface Inspection | <ul style="list-style-type: none"> ■ Perfect evaluation of topographical defects ■ Suitable for high-speed applications |
| Quality Control | <ul style="list-style-type: none"> ■ Scratches, creases, coating gaps, pinholes, protrusions, etc. are automatically detected and rejected |
| Flexibility | <ul style="list-style-type: none"> ■ Modular sensor system enables inspection of different roll widths |
| Interface | <ul style="list-style-type: none"> ■ Communication with PLC ■ Logged evaluation results |
| Extensions | <ul style="list-style-type: none"> ■ Deep learning for defect classification ■ Optical measurement of cells |
| Performance | <ul style="list-style-type: none"> ■ Microscopic defect detection at speeds of up to 50 m/min |