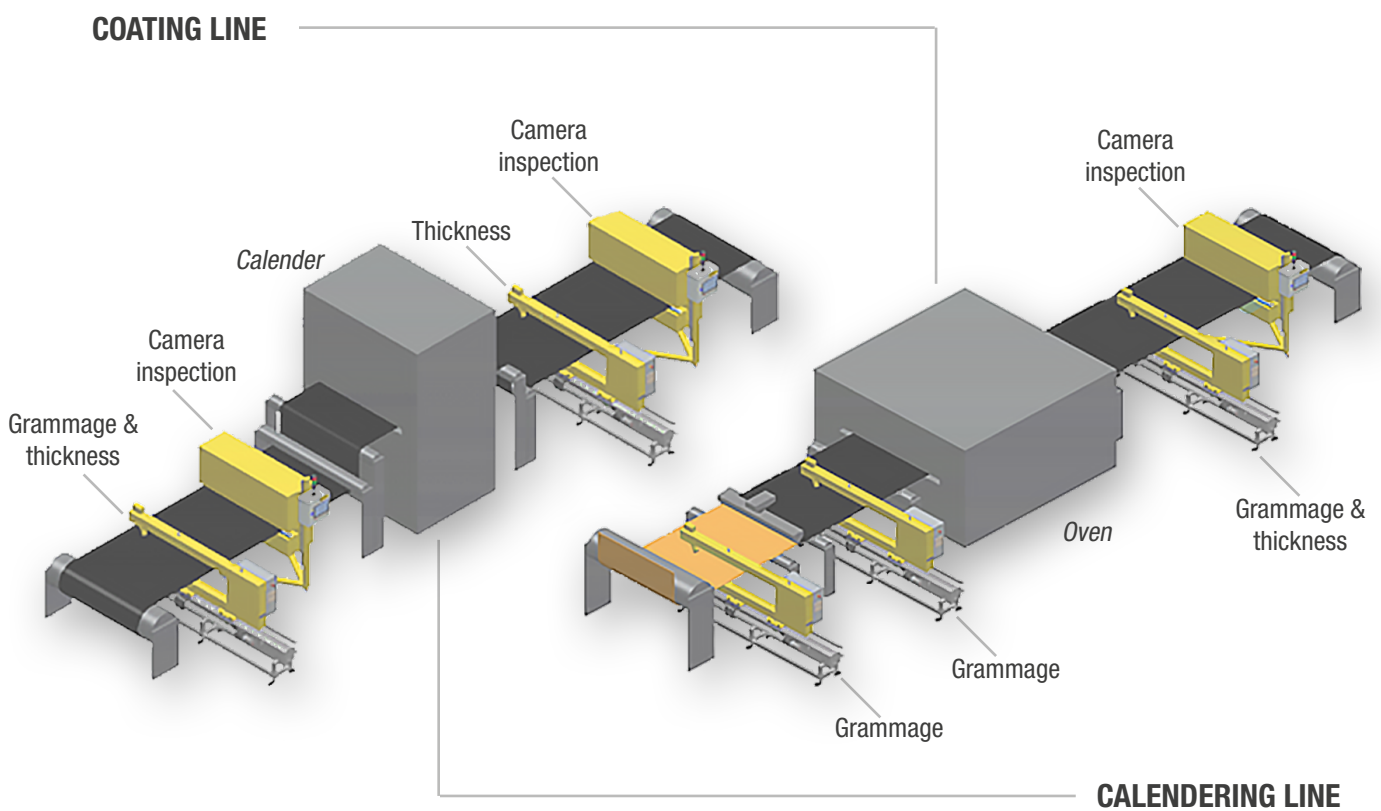




HAMMER-IMS

Inline Process & Quality control of electrodes



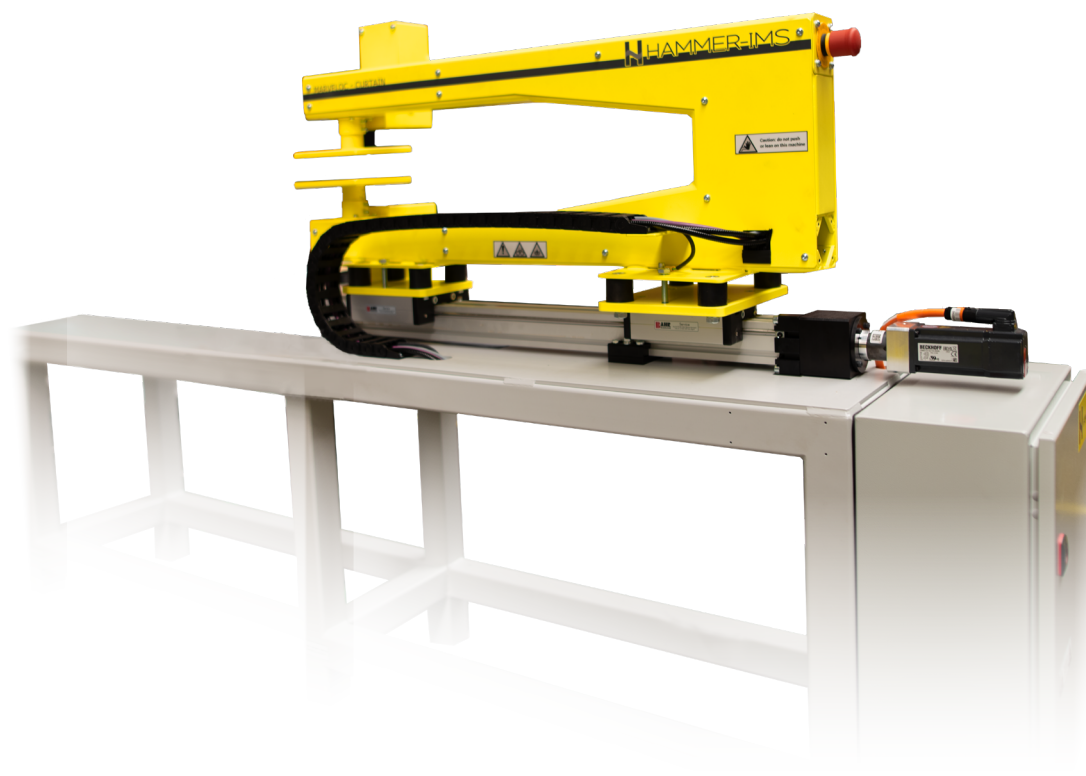
One-stop shop for battery manufacturing

Hammer-IMS provides comprehensive turnkey solutions for inline measurement and automated surface inspection. Our commitment lies in achieving precision, reliability, and significant value for our customers. In our quest for excellence, we rely on the seamless integration of mechanical components, advanced sensors, and cutting-edge data processing technology.

Every step in **battery manufacturing** requires reliability and precision to not only meet the high standards of quality and safety but also to focus on sustainable and economically efficient production practices.

Inline Scanner, Marveloc-CURTAIN-C

The Marveloc-CURTAIN-C scanner has been engineered to meet the exceptionally stringent requirements for thickness and basis weight measurement during the coating and calendering processes of electrodes. Its precision and reliability make it the ideal choice for demanding applications in **electrode production**.



Wide range of scanners depending on your case

A modular system is applicable for lines up to 1.400mm and offers you a wide range of measurement possibilities:

- **Thickness measurement** with confocal laser technology.
Accuracy down to 1 μm^* .
- **Coat weight measurement** with Hammer-IMS's U-Ray Sensor.
Accuracy down to 0,5% of the total weight*.
- **Combi-measurement** thickness & coat weight (density) measurement on one scanner.
- **Dimensional measurements.**
Coating width, dimension stripe & pattern coatings.
Coating edge geometries in combination with laser profilers.

Raw sensor data always requires **preprocessing** to clean and prepare it for analysis. This step may involve removing noise, filtering out outliers, and calibrating the data for accuracy. Hammer-IMS has developed **Connectivity 3.0**, a real-time and multi-sensor operating and processing software tailored for superior performance in process control. This cutting-edge software features an **intuitive graphical user interface**, ensuring ease of use and enhancing user experience. For in-depth information, read section "HMI, Connectivity 3.0," where you will find comprehensive details about this innovative software.

** Depending on the stability of the production line and environmental changes.*

Camera inspection, Edge-Vision-4.0

To ensure the production of **safe and sustainable batteries** according to the strictest quality standards and achieve maximum operational efficiency, the integration of an optical inspection system becomes imperative. Hammer-IMS's Edge-Vision-4.0 can proactively detect surface defects and continuously monitor surface characteristics and dimensions at every stage of electrode production.

Hammer-IMS's turnkey inspection solution will be designed and integrated to your individual needs. Edge-Vision-4.0 performs the following detection and monitoring tasks:

- **Local defect detection.**
- **Dimensional measurements.**
- **Process monitoring.**
 - Coating homogeneity.
 - Thermal imaging.

The **Edge-Vision-4.0** system seamlessly **integrates with the Connectivity 3.0 system**. The modern Human-Machine Interface (HMI) offers a simple and intuitive workflow, making it easy to teach and configure detection and classification algorithms. This user-friendly interface enhances the system's usability for operators and technicians.



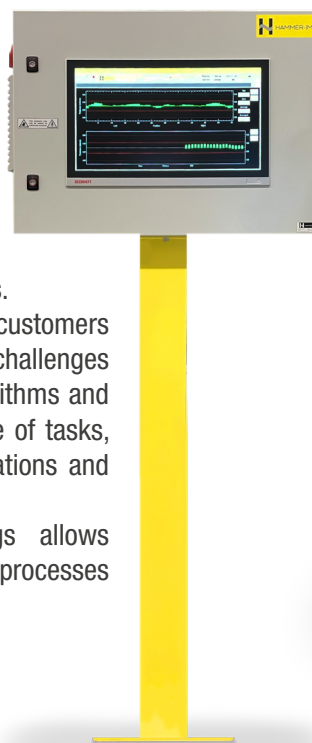
Edge-Vision-4.0

HMI, Connectivity 3.0

The user-friendly, straightforward, and logically designed **Connectivity 3.0 Interface** serves as a **unified platform for real-time monitoring and data processing across all sensors and automated surface inspection functions**. With a single HMI, it enables simultaneous operations and comprehensive data processing/storage, streamlining the entire process for enhanced efficiency and convenience.

The **Connectivity 3.0** software can be tailored to accommodate **customized algorithms and calculations**. This adaptability and flexibility in software design allow customers to create specific solutions that overcome their individual challenges and meet their needs and requirements. Customized algorithms and calculations can be implemented to address a wide range of tasks, from data analysis and optimization to specialized simulations and predictions.

The recipe selection tool with customizable settings allows manufacturers to manage and customize production processes effectively.



Industrial HMI units

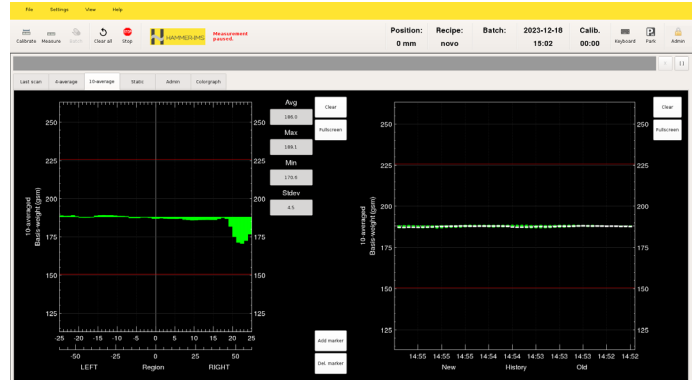
Data management and Interfaces

Data management in battery production is a crucial aspect of modern manufacturing processes ensuring top-quality control, process optimization, and traceability for product reliability, safety, and compliance.

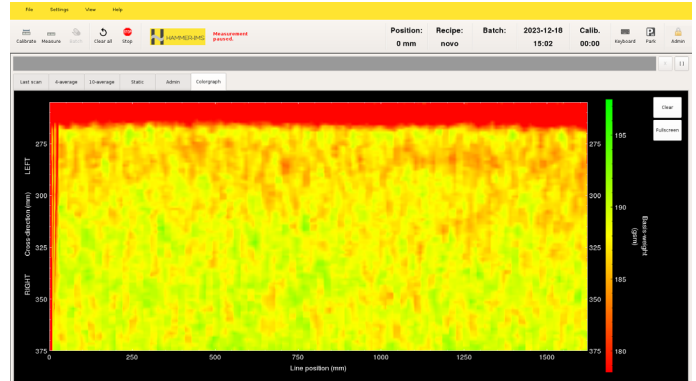
Hammer-IMS offers and implements a wide range of data interfaces:

- Secure **OPC UA integration** for standardized data exchange.
- Powerful **SQL database** (Microsoft SQL) for data logging and analysis.
- Effortless **FTP/SFTP** file transfer for data sharing.

The **BUS-INTERFACE-HUB** brings the capability to establish connections with other industrial bus networks, enabling **seamless data sharing in various formats**. This enhancement makes the system highly compatible to integrate into any process and workflow.



Profile and Trend view of thickness measurement



Enhanced 100% heat map (scanner movement in white) and trend of thickness measurement

Contact us to discuss your specific application

The list below provides a general product overview of the systems in this brochure and the software package for the control of it. An extensive list of add-ons can be implemented to your process and quality control system in consultation with a sales representative.

Product name	Product group	Product description	Combinations
Marveloc-CURTAIN-0 featuring U-Rays	Industrial basis-weight quality control systems.	Machine for basis-weight measurement of flat materials. Closed frame.	+ L-Ray for thickness measurements.
Marveloc-CURTAIN-C featuring U-Rays	Industrial basis-weight quality control systems	Machine for basis-weight measurement of flat materials. Open frame.	+ L-Ray for thickness measurements.
Marveloc-CURTAIN-C Slim featuring U-Rays	Industrial basis-weight quality control systems	Compact machine for basis-weight measurement of flat materials. Open frame.	+ L-Ray for thickness measurements.
Edge-Vision-4.0-CURTAIN-0	Machine-vision systems	Machine-vision solution for detection and classification of anomalies or continuous monitoring. Closed frame.	
Edge-Vision-4.0-CURTAIN-C	Machine-vision systems	Machine-vision solution for detection and classification of anomalies or continuous monitoring. Open frame.	
Connectivity 3.0	Control software	Industrial software to connect to PLCs and various information sources.	



Get in contact with our sales representatives



Explore our wide-range product brochure

Hammer-IMS nv
 Industrieweg 1401
 3540 Herk-de-Stad, Belgium
 www.hammer-IMS.com
 Info@hammer-IMS.com
 Phone: +32 11 36 55 01
 VAT (BE)0648.896.643
 RPR Antwerpen, Department Hasselt

Hammer-IMS Inc
 Tyger Ryver CEBED, 1875 E Main St
 Duncan, SC 29334, United States
 www.hammer-IMS.com
 Info@hammer-IMS.com
 VAT (BE)0648.896.643
 RPR Antwerpen, Department Hasselt

The data as listed in this brochure is nonbinding. Contact us to obtain a dedicated technical datasheet, a feasibility analysis for your industrial case, or to get in touch with our preferred integrators and resellers. Our general terms and conditions apply.

© Hammer-IMS nv 2024
 © Hammer-IMS inc 2024