ALPING ASIA

AUTOMATION

AlpRMS

BILLET RHOMBOIDITY MEASUREMENT SYSTEM

AIpRMS

BILLET RHOMBOIDITY MEASUREMENT SYSTEM

AIpRMS is an innovative system based on machine vision and aimed at finding the presence of the typical rhombic distortion in billets. Through image processing, it automatically calculates the billet's dimensional values, supplying prompt alerts and notifications in case of non-compliance.

OVERVIEW

- Precision: high quality images and accuracy down to a tenth of a millimetre
- Ease of use: no MV knowledge required
- Live alerts: immediate notification of non-compliant billets
- Real-time communication with plant automation and system surveillance
- Data logging and image storing on a dedicated database
- Modular design: from one to a maximum of four cameras
- Ease of installation: no complex assembly required
- Operating safety: no specialist needed in risk areas

The AIpRMS system in operation at steel factory.

AIpRMS automatically and routinely checks the geometry of the billets, finding any rhombic distortions and thus enabling prompt adjustments of the casting parameters as needed. The system allows for the constant verification of the process, improving production efficiency and reaching the best workflows. In addition, the ability to perform immediate checks at the entrance of the cooling bed reduces the number of non-compliant billets and proves to be of strategic importance in plants that use billet welders with specific work parameters.

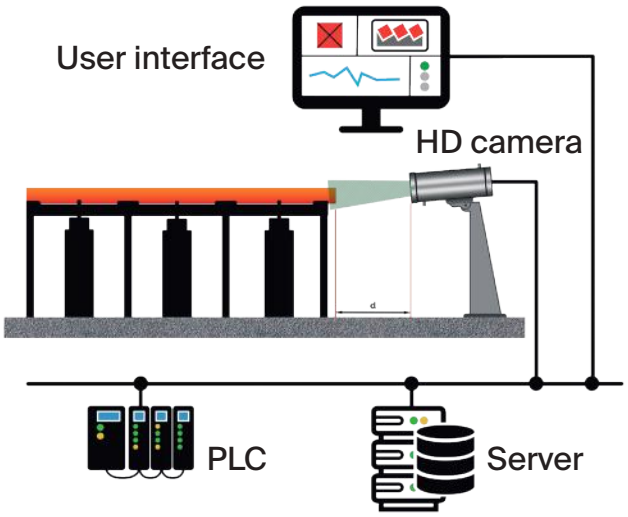
SYSTEM ARCHITECTURE

The basic structure of **AIpRMS** consists of a camera (it can scale up to four units), a server powered with machine vision technology for image analysis and a client for the operator interface.
The iba platform, widely used in the steel industry, integrates AIpRMS software architecture.
The installation of the system requires connection with the network's automation and data exchange with the pre-existing PLC that controls the movement of the billets.

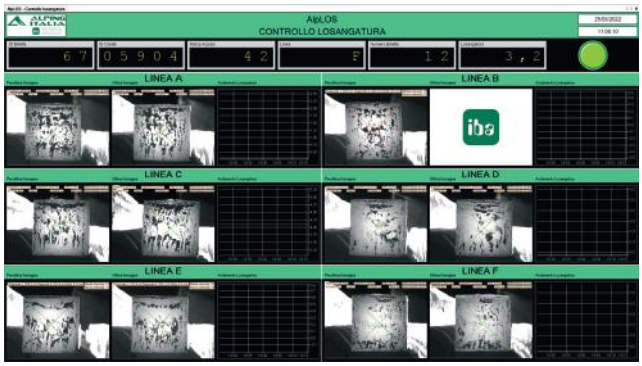
- ARTIFICIAL INTELLIGENCE
- MACHINE VISION
- DEEP LEARNING
- DATA LOGGING

HOW IT WORKS

The system captures and processes images of the face of the billet, calculates the dimensional values and verifies its compliance against pre-established parameters. In case of significant alterations, i.e., in the presence of anomalies higher than expected, the operator then receives an alert via the user interface. The defective billet can thus be found and removed.



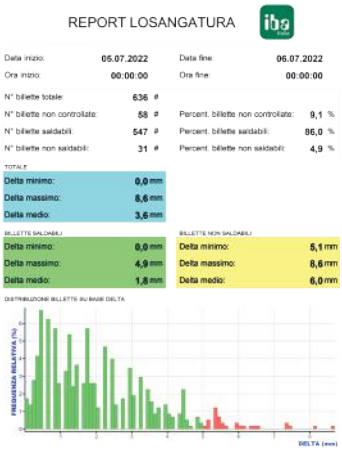
Schematics of a standard setup.



A screenshot of the user interface displaying the required information exhaustively.

USER INTERFACE

The system's user interface allows the operator exhaustive control over the data processed by the software by displaying the image of the billet, all the applicable parameters and each data relevant to the product, such as the casting identifier, the billet ID, the line number, the steel brand and the rhomboid's delta. Traffic- light like coloured alerts show at once the outcome of the product's screening showing whether the billet is compliant. Completing the key features of the system are data-logging and image storing dedicated facilities and the regular release of statistical reports.



An example of a statistical data report.

TECHNICAL SPECIFICATIONS			
Measuring resolution	0.6 ÷ 0.8 mm	Optics	75 ÷ 100 mm
Rhomboid distortion	Minimum 5 mm - Configurable parameter	LED illuminator	Optional
Acquisition interval between two billets	30 s	Liquid-cooled housing	Flow rate 2l/min (single housing)
Capture trigger	Sent via PLC at each new billet	Camera distance from billet's face (d)	3500 ÷ 4500 mm
HD Camera/s	1 ÷4	Mechanical installation requirements	Perpendicular to the surface to be inspected
Image resolution	1.5 MP o 5 MP	Storage capacity	3.000.000 Basic images

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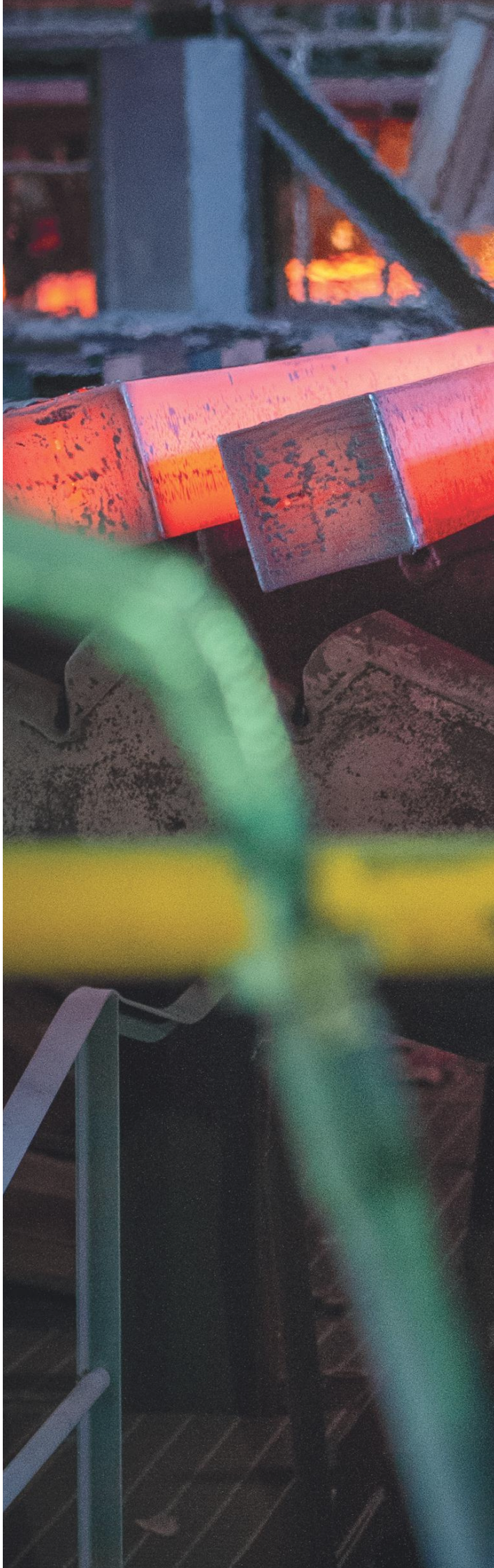

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