

# SpechtLab PM Series

High-Precision Profile  
Measurement Sensor

High-Speed Optical Profile  
Measurement for Industrial  
Production Lines.



# Engineering Faultless Production.

SpechtLab is a high-tech R&D engineering firm dedicated to transforming industrial production. We produce innovative, digitally-integrated measurement systems that boost efficiency, lower the risk of malproduction, and accelerate production rates for the most demanding factory environments.



**Machine Vision Technologies:**  
Advanced CMOS and laser integration.



**Optical Measurement Systems:** Micron-level 2D/3D surface profiling.



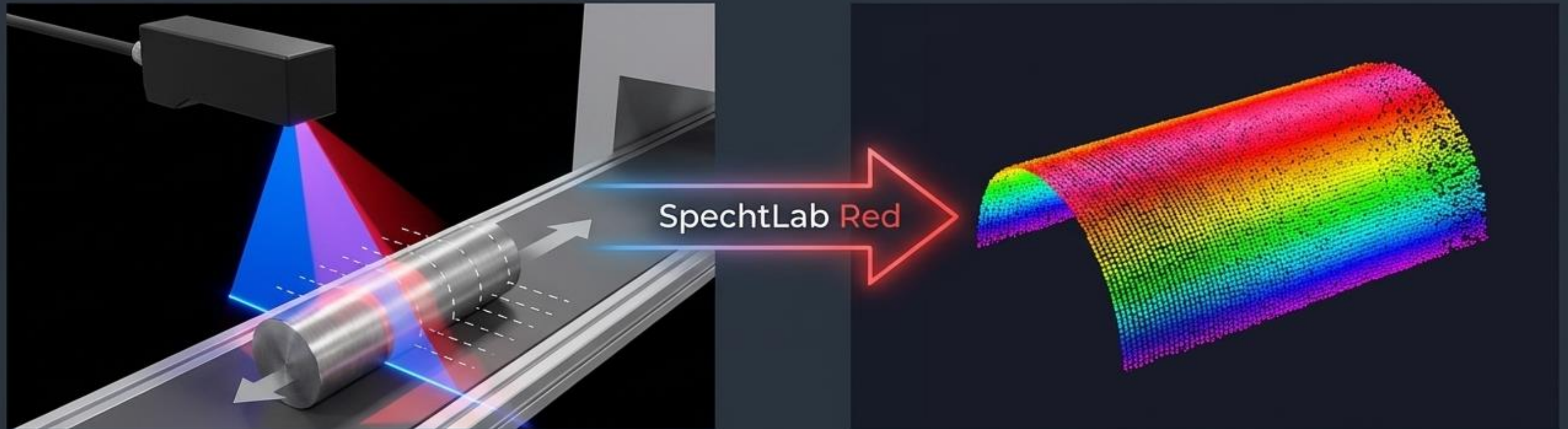
**Industrial Automation:**  
Seamless Industry 4.0 and PLC connectivity.



**AI-Assisted Inspection:**  
Next-generation defect detection and spatial tracking.

# PM Series: 2D/3D Profiling at the Speed of Production.

The SpechtLab PM Series is a high-resolution, real-time surface profiling sensor engineered for the factory floor.



## No Material Deformation

Optical scanning ensures delicate, hot, or moving targets remain entirely untouched.

## Continuous Operation

Eliminates the mechanical wear-and-tear of tactile probes, reducing maintenance to near zero.

## True Real-Time

Captures exact dimensional data and 3D topographies of objects instantly as they travel down the production line.

# Engineered for Critical Automation Demands.



## High-Resolution Optical Profiling

Achieves precision down to 80  $\mu\text{m}$ , capturing intricate geometries and micro-defects with absolute clarity.



## Real-Time Data Acquisition

Processes thousands of data points instantly for zero-latency inline inspection.



## Non-Contact Technology

Measures regardless of surface texture, color, or material (metal, plastic, wood) without physical interference.



## High-Speed Capability

Built to match the velocity of continuous rolling mills and high-throughput conveyor systems.



## Robust Industrial Design

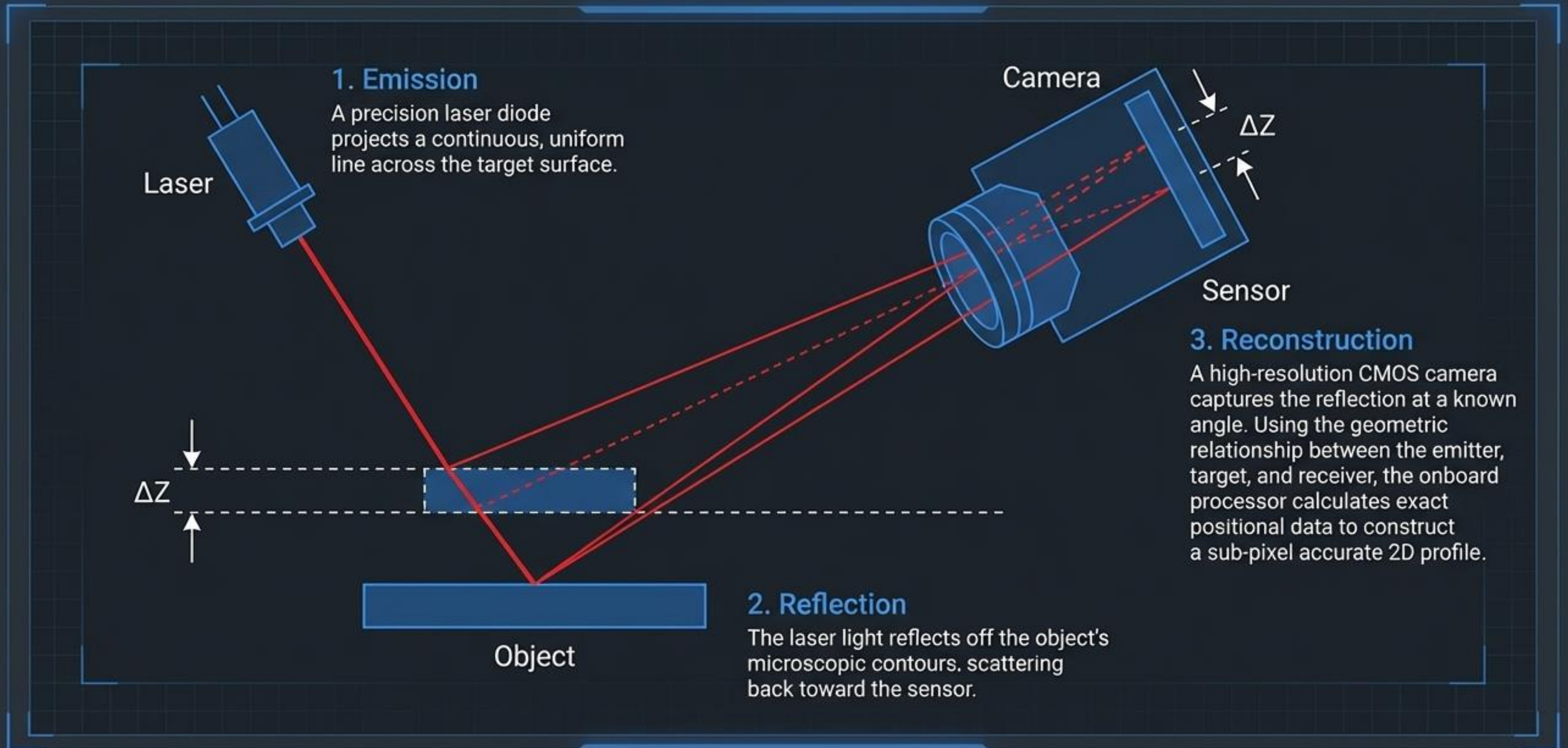
Enclosed in a rugged, lightweight Aluminum chassis with an IP65 protection rating to withstand harsh, dusty environments.



## Seamless Integration

Operates as a standalone unit, a dual-sensor array, or a scalable network tailored to existing factory architectures.

# The Physics of Precision: Laser Triangulation.



# Comprehensive Measurement Capabilities.

## 2D Profile Analysis

**Dimensional:** Width, Height, Depth, Distance.



**Positional:** X-Position, X-Center.



**Geometric:** X-Angle, Intersection Angle, Radius.



**Assembly:** Gap and Flush analysis.

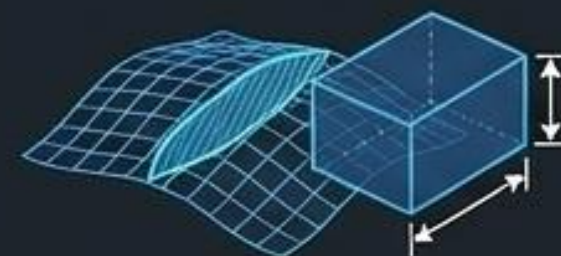


## 3D Surface & Topography

**Contour:** Outer Radius, Inner Radius.



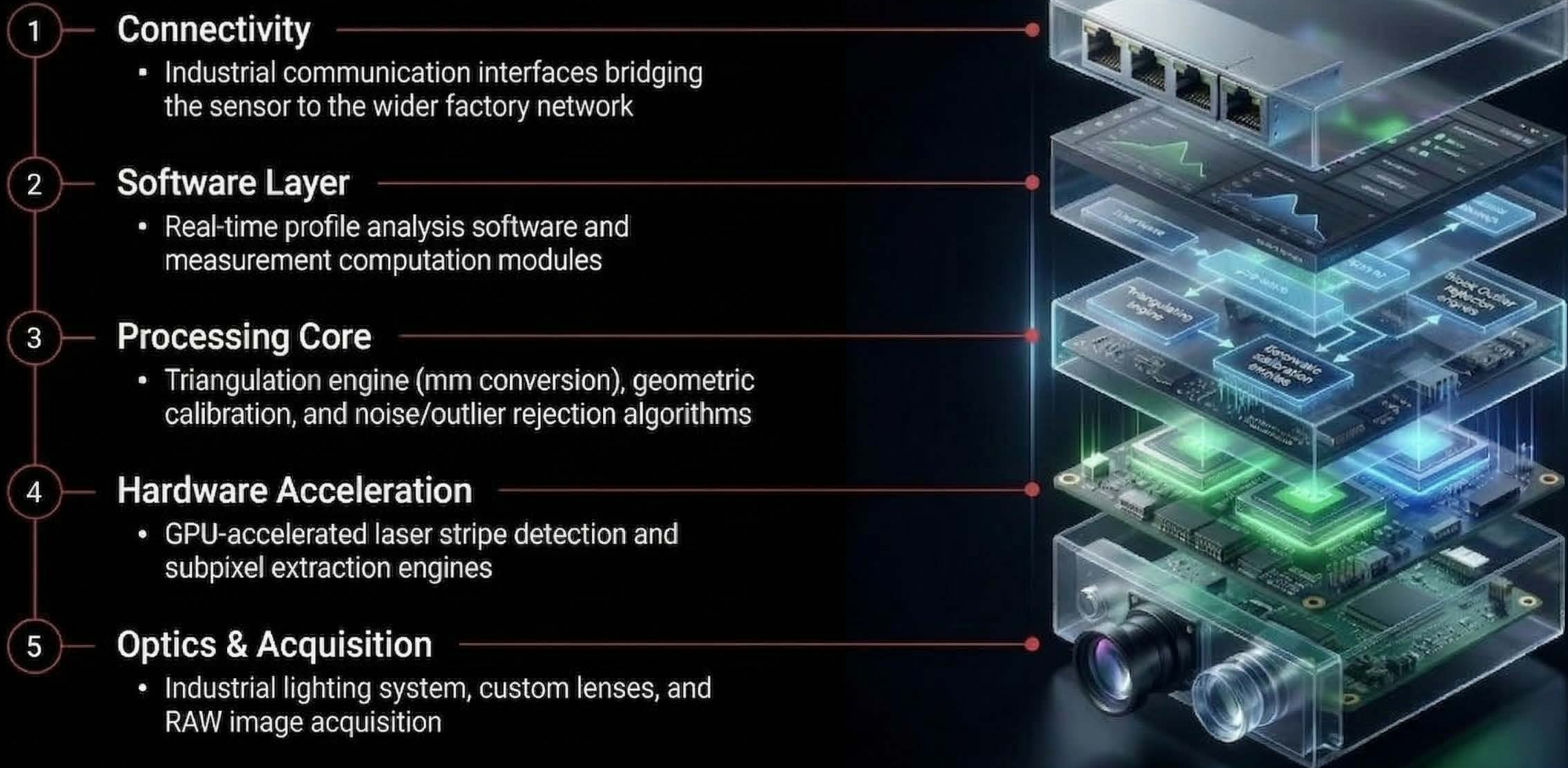
**Volume:** Cross-sectional Area, Box Area.



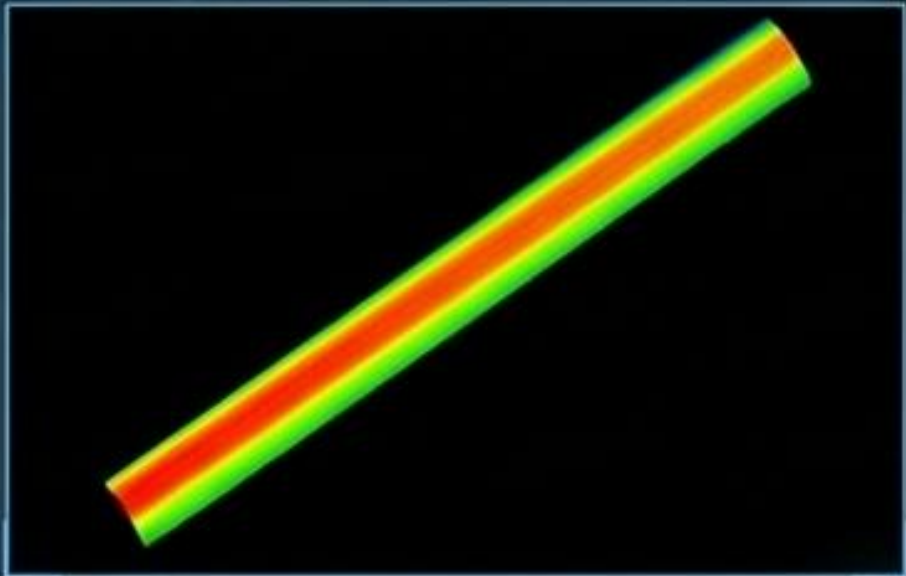
**Integrity:** Surface Deformation, Object Shape Analysis, Real-Time Surface Matching.



# System Architecture: The Edge-Computing Stack

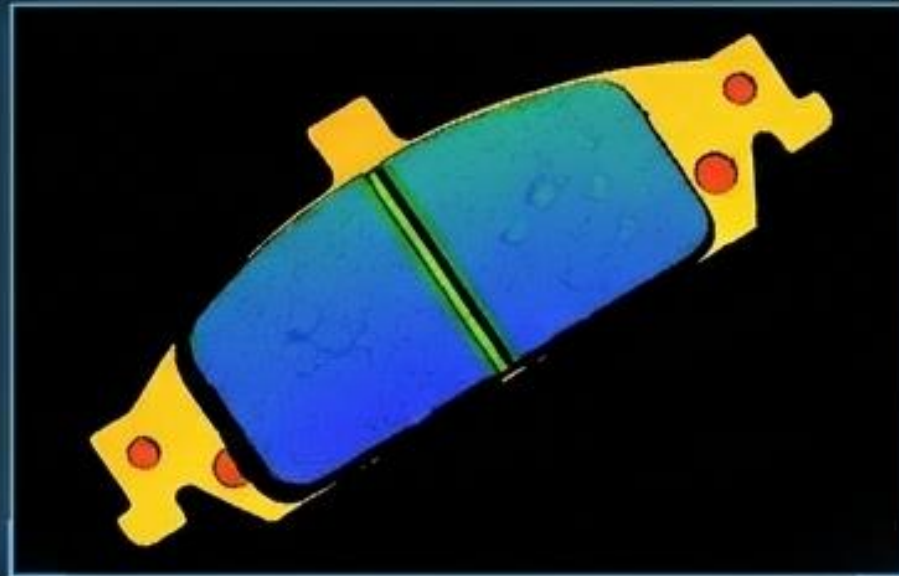


# Versatility Across Industrial Applications.



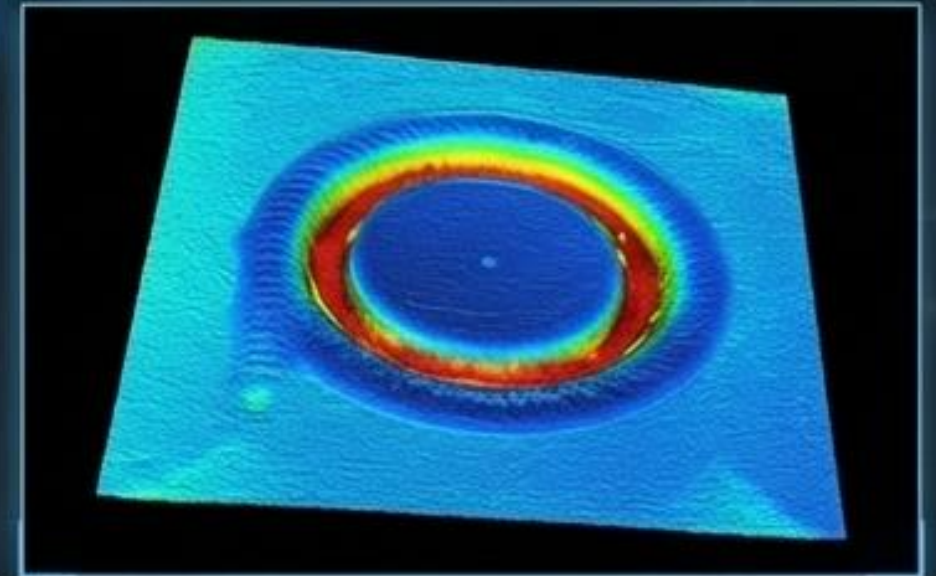
## Steel & Metal Processing

- ▶ Steel strip profile measurement.
- ▶ Rolling mill profile monitoring.
- ▶ Metal surface and welding inspection.



## Automotive Components

- ▶ Brake pad defect detection.
- ▶ Panel gap and flush inspection.
- ▶ Tire DOT code reading.



## EV Battery & Electronics

- ▶ Cap and busbar welding inspection.
- ▶ Connector pin height verification.

# Actionable Data via Advanced Software.

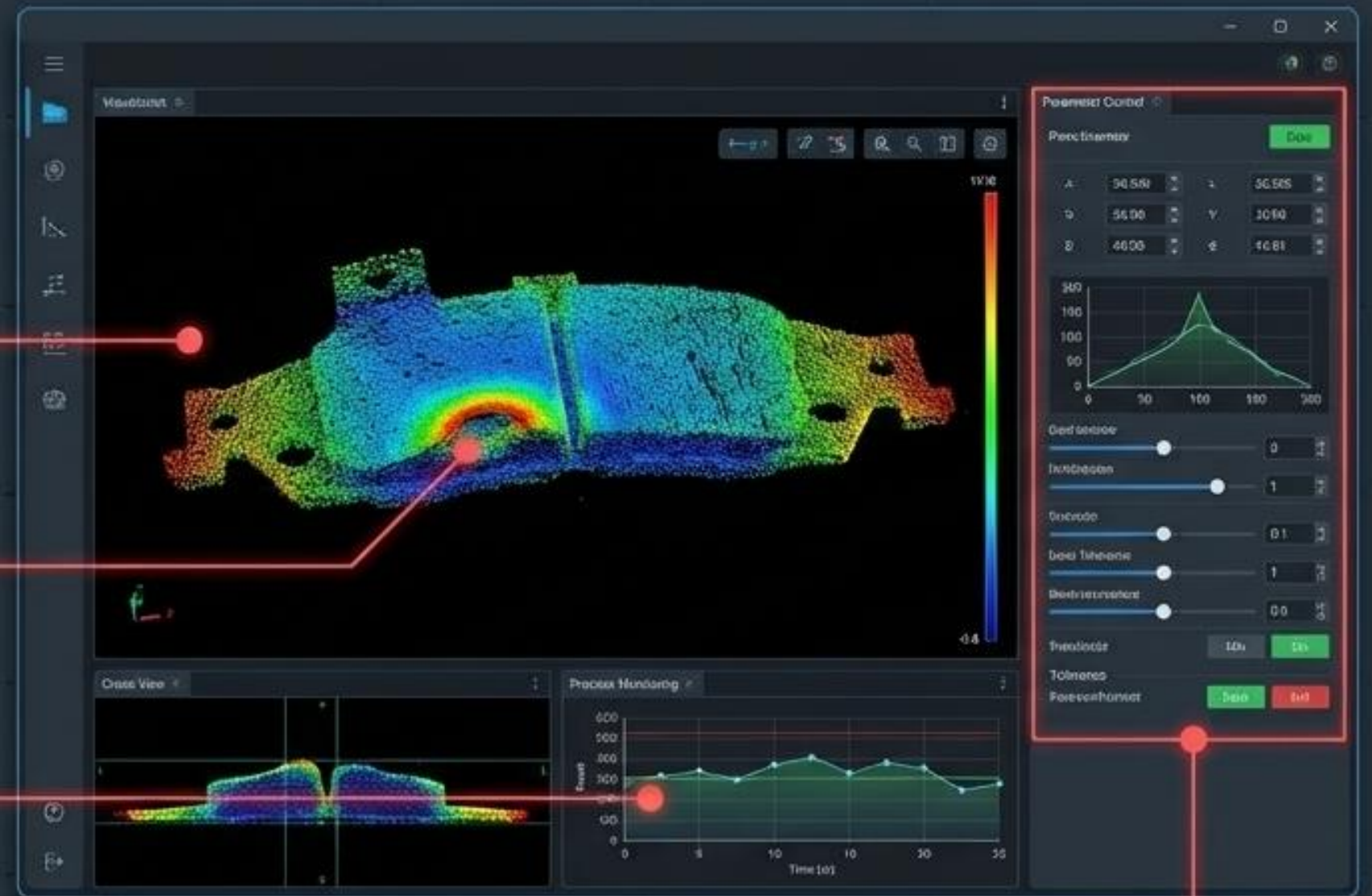
The PM Series translates raw photon data into statistical process control. Pre-programmed machine vision algorithms allow for rapid deployment without complex coding.

**Real-Time Visualization:** Instantly view point clouds and profile cross-sections.

**Surface Analysis:** Execute advanced algorithms to detect micron-level deformations.

**Process Monitoring:** Track statistical production quality over time.

**Parameter Control:** Easily define measurement thresholds (Min/Max tolerances) for automated Pass/Fail decisions.



SpechtLab

# Beyond Vision: The Industry 4.0 Ecosystem



**PM Sensor**



## **SpechtLab DataPool™**

Centralized big data integration  
from all factory sensors.

### **AI-Assisted Analytics**

Real-time defect detection  
recognizing patterns invisible  
to the human eye.

### **Predictive Maintenance**

Equipment monitoring to  
drastically reduce unplanned  
downtime and extend  
machinery lifespan.

### **Closed-Loop Control**

Autonomous micro-adjustments  
executed directly via PLCs and  
Level 2 systems.

# Technical Specifications.



<b>System Models</b>	SP2M-B3B-35-30, SP2M-B3B-25-30, SP2M-B3B-16-30, SP3M-B3B-12-30
<b>Measurement Accuracy</b>	Up to 80 $\mu\text{m}$ precision
<b>Enclosure Material</b>	Industrial-grade Aluminum
<b>Protection Rating</b>	IP65 (Dust-tight, protected against water jets)
<b>Sensor Interface</b>	Ethernet (RJ45 x 1), Digital I/O
<b>Thermal Management</b>	Optional auxiliary cooling systems available for high-temperature environments
<b>Surface Compatibility</b>	Metal, plastic, wood (independent of color or texture)

# Operational Benefits: The ROI of Precision.

## **Input: Real-Time Profiling**

Instantly captures geometries without slowing line speed.

## **Action: Early Defect Detection**

Identifies malproduction (gaps, deformities, bad welds) the moment they occur.

## **Result: Reduced Material Waste**

Halts out-of-spec production before raw materials are squandered.

## **Output: Increased Process Stability**

Delivers an operator-independent, fully automated quality standard.



# Industrial Field Application: Spiral Pipe Weld Inspection.

## The Challenge

In steel pipe manufacturing, operators struggle to visually track high-speed welding deviations, leading to inconsistent quality and post-production rejection.

## The SpechtLab Solution

A PM Series sensor and Box PC processing unit are integrated directly onto the active welding line.

## The Results

- **Real-Time Tracking:** The system instantly scans weld geometry, catching micrometer deviations invisible to the human eye.
- **Operator Support:** Live trajectory and thickness data is fed to the operator screen, eliminating guesswork.
- **Data Archiving:** Axon reporting software creates verifiable, data-driven production logs for end-clients, securing total quality standardization.

# Upgrade Your Production Baseline.

---

- Validate ROI with a targeted line entry pilot.
- Consult with our metallurgical and optical integration experts.

info@spechtlab.com | +90 506 884 01 56