



## SpechtLab Stroboscopic LED Illumination (BL Series)

High-Intensity Stroboscopic Lighting for High-Speed Industrial Inspection.

Capturing the Invisible at 2000+ m/min.

# Capturing the Invisible

## SpechtLab Multi-Purpose Industrial Stroboscopic Lighting Solutions



Maximum control, minimum loss in high-speed production lines.

# Illuminating the Industrial Nervous System

## End-to-End Vision

SpechtLab engineers end-to-end industrial machine vision technologies and high-precision optical measurement systems.

## Heavy Industry Origins

Born from the extreme demands of steel production, our hardware thrives in the most punishing manufacturing environments.

## Zero-Defect Intelligence

Our mission is to transform scattered sensor data into actionable intelligence. We build the eyes and the brain of Industry 4.0.

# The Problem: Blindness Brought by Speed



## The Physics of Blur

As lines accelerate beyond 2000 m/min, standard continuous illumination systems fail to resolve moving details.

## The Result

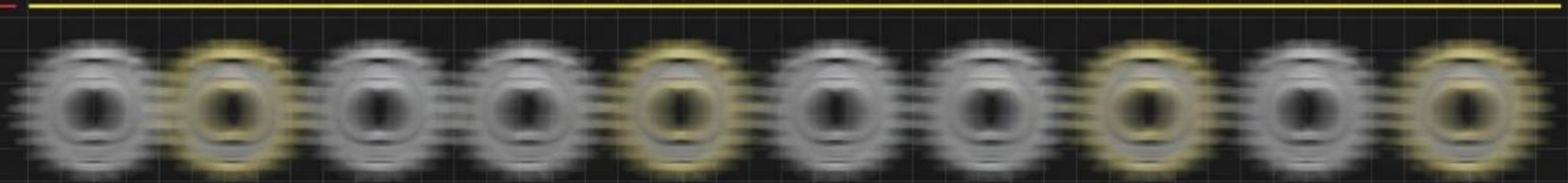
Critical surface defects, weld tears, or print misalignments degrade into blurred streaks, generating undetected scrap.

## The Solution

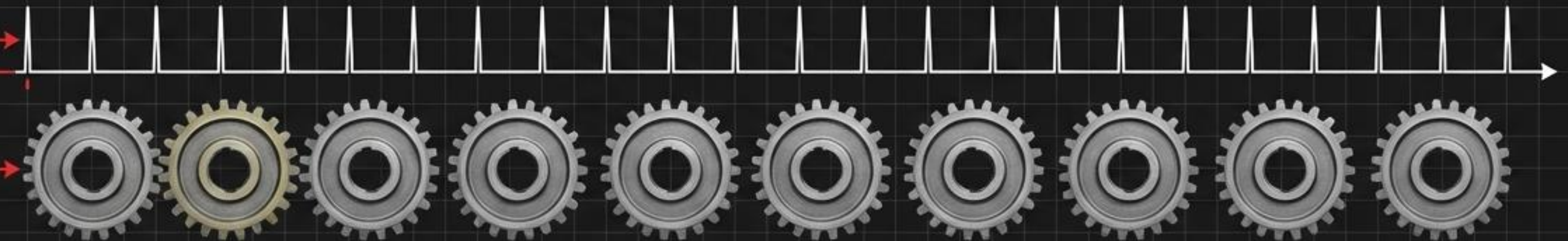
SpechtLab BL Series. Ultra-short pulse stroboscopic lighting designed specifically to conquer the physics of high-speed machine vision.

# Technology Vision: The "Frozen Image" Principle

Continuous  
Lighting  
(Standard)



Stroboscopic  
Lighting  
(SpechtLab)



## Mechanism

Generates microsecond ( $\mu\text{s}$ ) flashes perfectly synchronized with the speed of the object and the camera's shutter.

## Stopping Time

By modulating light at high frequencies with ultra-short durations, the stroboscope completely eliminates motion blur.

## Extended Visibility

High-frequency periodic defects are rendered flawlessly sharp, as if the product were stationary on a workbench.

# Flexible Hardware Architecture

## Dense LED Arrays:

High-density configuration for maximum light output over extended ranges (up to 3000mm).



## Wavelength Modularity:

Available in interchangeable profiles including White, UV, and IR (equipped with IR cut filters) adapting to any material inspection requirement.

**$\mu$ s-Precision Control:** Fully adjustable flash width with microsecond accuracy, guaranteeing the optimal stop effect regardless of variable line speeds.

# Peak Optical Performance at Extremes.



**2000+** m/min

## Thermal Stability

Advanced thermal distribution prevents heating even at extreme flash frequencies, ensuring 100% stability for 24/7 continuous operations.



**μs** Activation

## Energy Efficiency

Consumes energy only during the microsecond exposure windows, yielding massive power savings over continuous halogen lights.

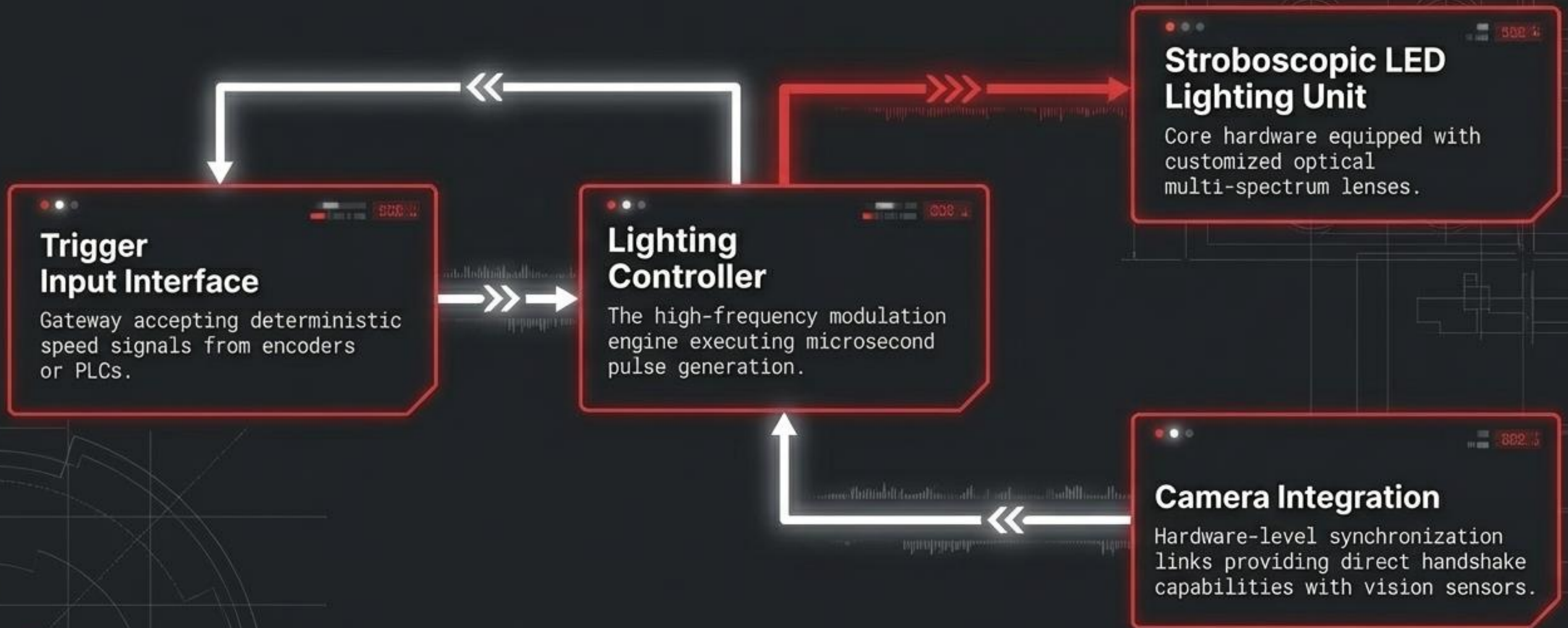


**5x** Lifespan

## Ultra Long Life

The fundamental on/off dynamics of stroboscopic operation multiply the physical lifespan of the LED components exponentially.

# Modular System Architecture.



# Universal Integration: Plug-and-Play Architecture.



Compatible with standard industrial architectures.  
Flexible internal and external trigger modes.

Brand-agnostic architecture.  
Seamless integration with all leading vision cameras and Industry 4.0 data pools.

# Technical Specifications.

<b>Technology</b>	High-Frequency Stroboscopic LED
<b>Peak Light Intensity</b>	Ultra-high yield (customizable per lens array)
<b>Pulse Duration</b>	Microsecond ( $\mu$ s) level adjustability
<b>Trigger Input Type</b>	Internal / External (PLC & Encoder compatible)
<b>Spectral Output</b>	Multi-Spectrum Options (White, UV, IR)
<b>Cooling Method</b>	Passive advanced thermal distribution
<b>Industrial Protection</b>	IP65 Heavy Industry Grade

# Sectoral Adaptation Matrix

Sector	Typical Defect (Problem)	SpechtLab Advantage (Solution)
Steel, Metal & Aluminum	Surface discontinuities, weld holes, edge tears.	Glare-free, homogenous lighting for micron-level surface mapping.
Paper & Packaging	Tears in high-speed winding, coating flaws.	Freezing paper texture for real-time defect analysis.
Printing	Color and pattern shifting at speed.	UV/White light switching for millimeter-precise color calibration.
Textile	Yarn breaks, microscopic weaving errors.	Stop-effect on flowing fabric for instant warp/weft inspection.



1

## The Crisis

Aluminum sheet moving at 1500 m/min. Capillary scratches appear as invisible, blurry streaks to standard line cameras.

2

## The Intervention

SpechtLab BL Series Strobe is deployed. Synchronized directly with the line's encoder, it fires microsecond flashes perfectly matching the velocity of the line.

3

## The Result

The visual stream is optically frozen. The automated vision system detects the defect in real-time, averting downstream waste, saving operational costs, and ensuring inspection reliability.

# The ROI of Perfect Vision



## Scrap Minimization

High-speed detection of pinholes and edge tears allows for instant correction, saving massive tonnages of raw material.



## Equipment Optimization

Providing AI algorithms with the highest-contrast raw images ensures absolute precision, enabling data-driven dynamic changes to machine parameters.

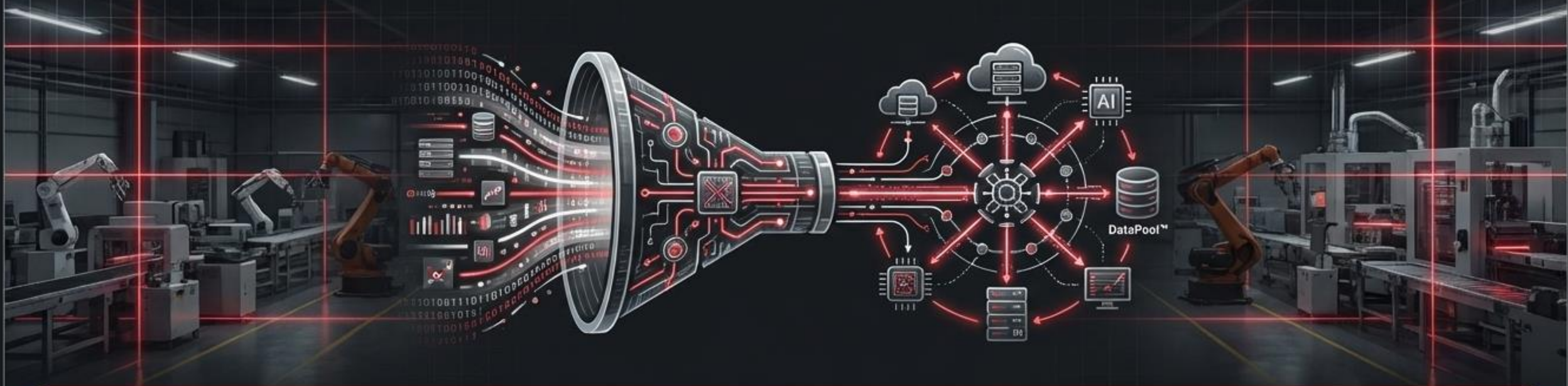


## Zero Downtime

Rugged physical build and thermal stability mean quality control never stops, completely eliminating unplanned line shutdowns caused by sensor blindness.

# Scale to the Future.

Flawless visual data is the foundation of the Industry 4.0 Ecosystem. Feed pure, unblurred data into your AI anomaly detection and centralized DataPools.



For custom system integration and hardware demonstrations tailored to your production line speed:

info@spechtlab.com | +90 506 884 01 56 | METU Technopolis - Ankara

