

**MANN +
HUMMEL**

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ENTERPRISE SUCCESS STORY

The Frictionless Factory: Unleashing Productivity through Ergonomic Innovation

How MANN+HUMMEL achieved seamless traceability and rapid operational flow with VEGA wearable technology.

THREAD IN MOTION



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**Introduction: Setting
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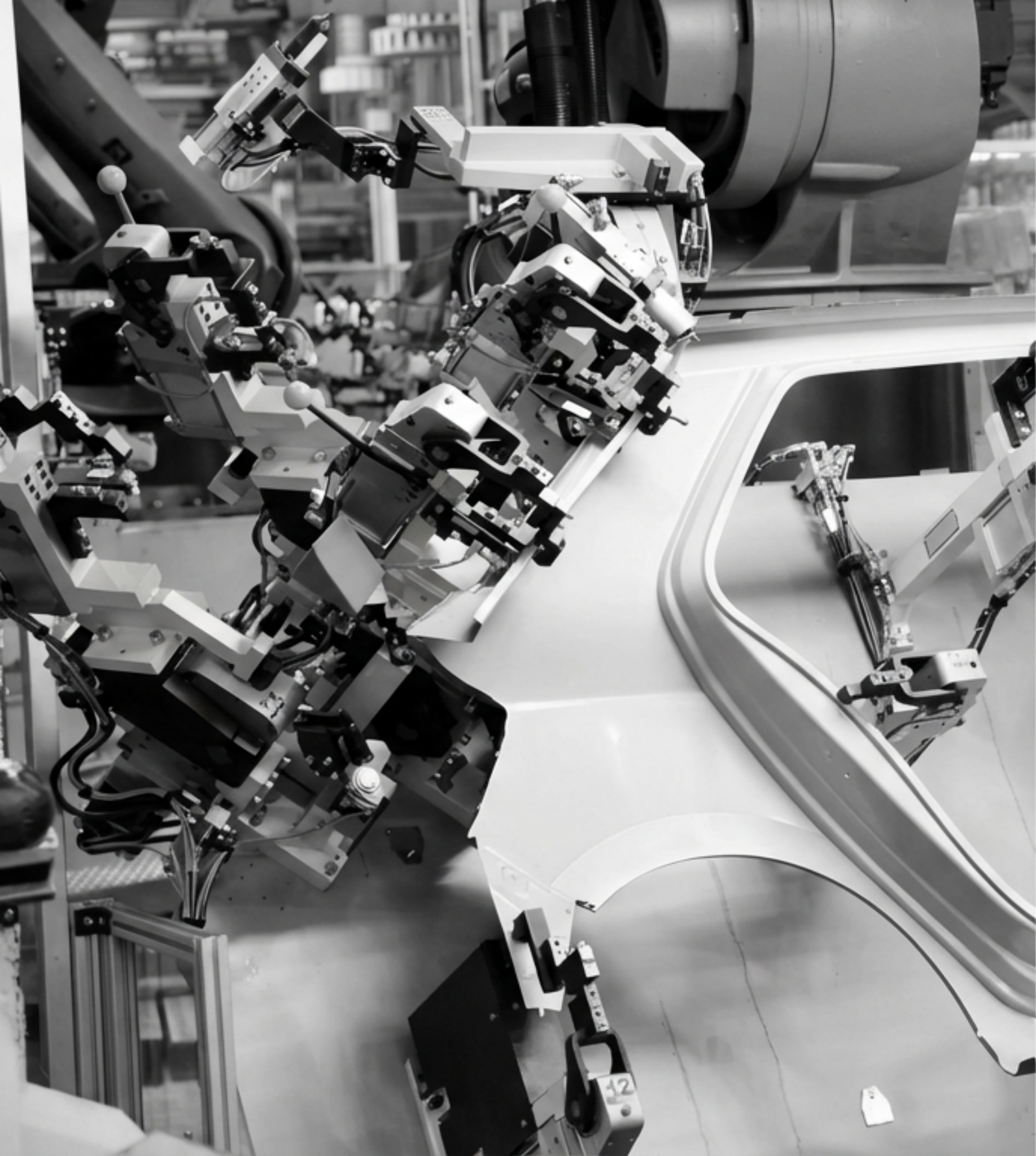
**Strategic Vision &
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Connect With Us



01 | INTRODUCTION

Setting the Global Standard in Filtration Technology

**Tier-1
Automotive
Supplier**

**80+
Global
Locations**

**~20,000
Employees**

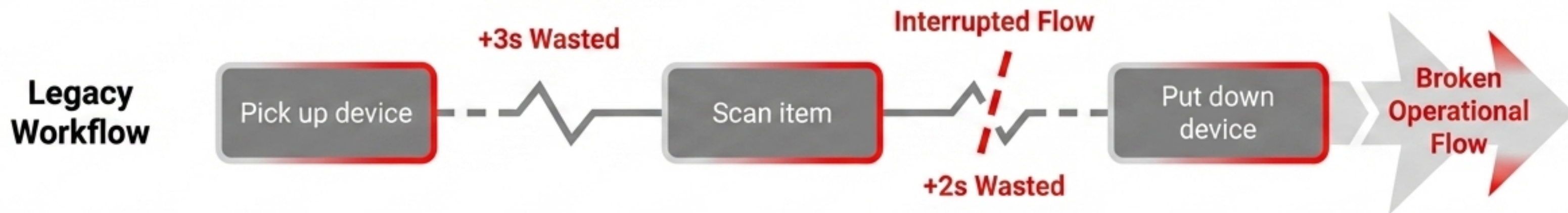
MANN+HUMMEL operates as a premier development partner and OEM supplier for the global automotive and mechanical engineering sectors.

Committed to Industry 4.0 principles, the enterprise continuously elevates manufacturing productivity through agile, connected digital ecosystems.

In critical automotive assembly, zero-defect manufacturing is non-negotiable. MANN+HUMMEL required a framework guaranteeing absolute component traceability without compromising the agility, natural movement, or safety of their global workforce.

The Invisible Drag of Legacy Barcode Scanning

Conventional handheld terminals created critical bottlenecks on the assembly line, severely disrupting continuous operational flow and introducing micro-inefficiencies.



Process Fragmentation

The repetitive 'pick up, aim, scan, put down' cycle fragmented natural assembly motions, extending operation times and diluting productivity.



Ergonomic Strain

Bulky pistol-grip devices required continuous awkward posturing, inducing wrist fatigue, musculoskeletal strain, and diminished worker focus.



Traceability Risks

Cumbersome manual handling increased the vulnerability to skipped scans, threatening the integrity of closed-loop component verification.

VEGA: Pioneering the Hands-Free Assembly Paradigm

To eradicate assembly bottlenecks, MANN+HUMMEL deployed Thread In Motion's VEGA wearable terminals. This intervention transformed operators into connected nodes within the Manufacturing Execution System (MES), seamlessly bridging human agility with digital precision.

Continuous-Flow Ergonomics

Wearable form-factor liberates both hands, allowing fluid, simultaneous part handling and data capture without workflow interruption.

Zero-Friction Integration

Plug-and-play architecture utilizing standard USB/serial interfaces eliminated the need for complex IT infrastructure overhauls.

Real-Time MES Synchronization

Customized prefix/suffix configurations ensure instant, flawless logging directly into the enterprise database.



Quantifying the Impact of Frictionless Operations

VELOCITY & THROUGHPUT

4 Seconds Saved Per Scan

Impact: Elimination of idle handling time results in immediate, compounding throughput acceleration across assembly lines.

ABSOLUTE TRACEABILITY

100% Closed-Loop Verification

Impact: Automated, real-time logging ensures perfect component sequencing, reducing assembly errors and fortifying quality assurance.

ADVANCED ERGONOMICS

Zero Device-Induced Fatigue

Impact: Lightweight, natural-movement design drastically mitigates physical strain and occupational health and safety (OHS) risks.

WORKFORCE OPTIMIZATION

Elevated Job Satisfaction

Impact: Removing physical frustrations fosters a safer, modernized work environment, driving sustained focus and employee morale.

Rapid Scalability and Industry 4.0 Alignment

The VEGA deployment proved that profound operational transformations do not require protracted integration cycles. By combining ergonomic hardware with agile software, MANN+HUMMEL established a highly scalable blueprint for future manufacturing excellence.



Scale

Over 100+ wearable units seamlessly activated.

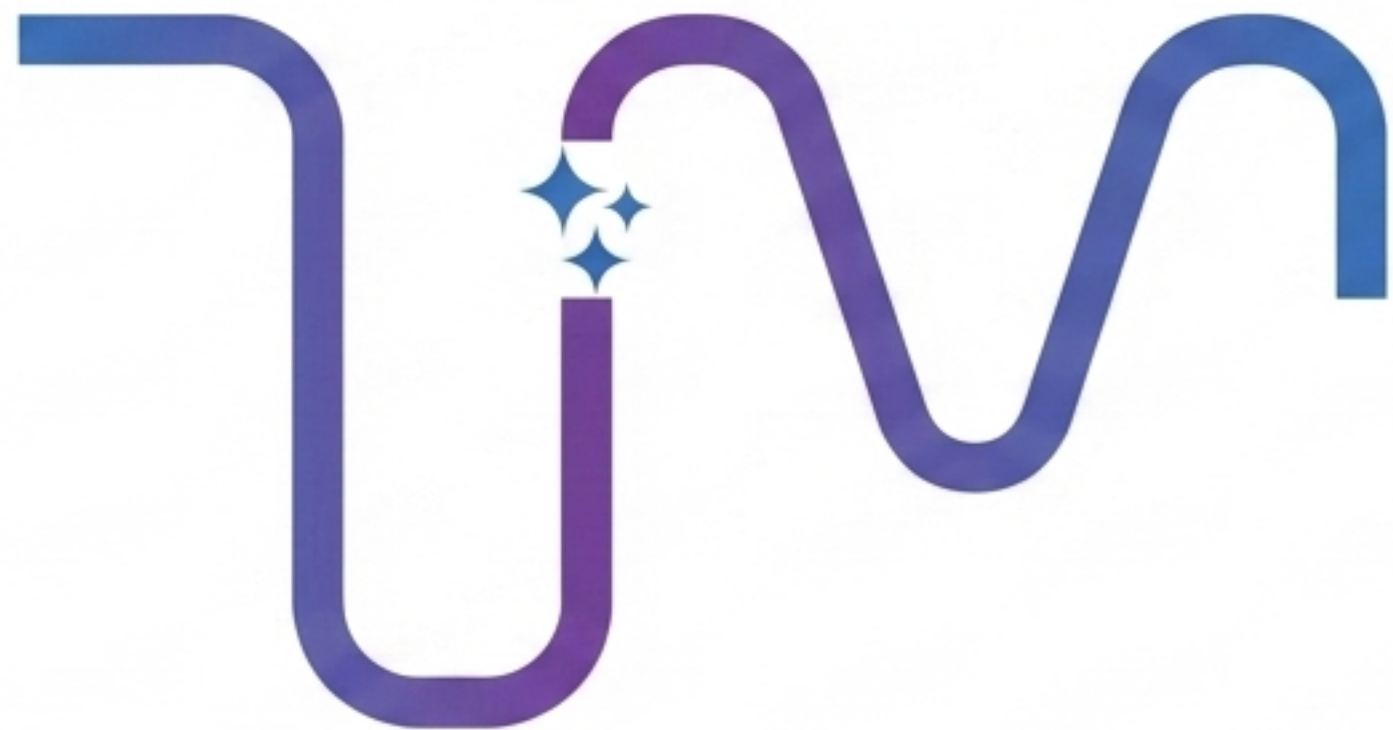
Speed

Comprehensive rollout across European production sites executed in just 14 days.

Strategic Outcome:

This initiative solidifies MANN+HUMMEL's leadership in Industry 4.0, proving that prioritizing human-centric design directly yields world-class manufacturing performance.

THREAD IN MOTION



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