



**HOW A MAHARASHTRA-
BASED FOUNDRY
DIGITALLY TRANSFORMED
ITS 15-YEAR-OLD CORE
SHOOTER WITHOUT
REPLACING THE PLC**

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Overview

A leading precision component manufacturer in Maharashtra's metal casting sector faced mounting quality and planning issues stemming from a legacy core shooter system. The machine—central to its production line—was powered by a 15+ year-old Messung PLC, unsupported by OEMs and offering no data visibility.

Rather than undertaking an expensive and disruptive PLC replacement, the factory partnered with S2R2 to retrofit the system for real-time monitoring. Within five days and zero production loss, the equipment was upgraded into a fully visible, data-logged asset.

Industry & Application Profile

- Industry: Metal Casting
- Specialization: Core Shooter for automotive and industrial component production
- Geography: Kolhapur region, Maharashtra
- Machine: Susha Core Shooter (15+ years old)
- Control System: Messung PLC (no OEM support)
- Challenges: Quality defects, undiagnosed faults, manual shift planning, lack of real-time data

➔ The Challenge

The plant's core shooter, though operational, had become a point of recurring quality failures and downtime. Production heads and maintenance teams observed rising rejection rates and unpredictable behavior, but the root causes remained unclear due to lack of instrumentation and monitoring.

Key Problems Identified:

- **No temperature visibility:** Left and right heating zones could drift apart, leading to inconsistent core quality
- **No part count automation:** Production tracking relied on manual estimates, reducing shift planning accuracy
- **No condition monitoring:** Coil failures and electrical wear were detected only after breakdowns occurred
- **No OEM support:** PLC was obsolete; proposed replacement was estimated at ₹1.5 lakh per machine
- **Risk of downtime:** Replacing the control system meant production loss during reinstallation and revalidation

This scenario reflects a common challenge across India's Tier-2 manufacturing landscape: older machines still function mechanically but lack the intelligence needed to support modern quality and throughput demands.

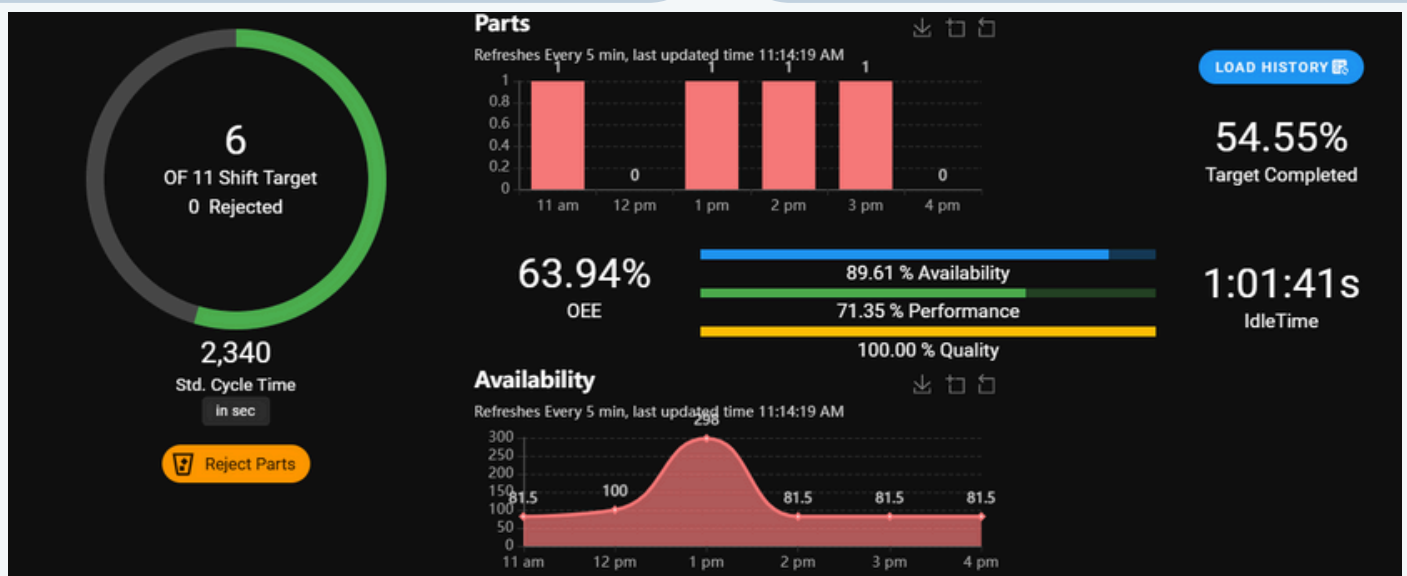
➔ The S2R2 Retrofit Approach

Rather than replacing the legacy system, S2R2 engineered a custom non-invasive retrofit solution. The goal was to introduce real-time process visibility, without requiring rewiring, PLC reprogramming, or production stoppage.

Key Problems Identified:

- **Dual-Zone Temperature Monitoring:** Sensors installed to independently track heating zones
- **Live Current Flow Monitoring:** Coil usage patterns monitored for early fault detection
- **Auto Part Counting:** Each core shot logged and visualized for shift-level tracking
- **Operator Dashboard:** Simple interface placed near the machine for on-floor awareness
- **Legacy PLC Interface:** Custom logic modules extracted relevant signals without modifying the core PLC logic

The entire system was designed to integrate seamlessly with existing workflows, providing machine-side visibility and cloud-based dashboards without changing the operator routines or interrupting live production.



Business Results in 30 Days

METRIC	BEFORE IMPLEMENTATION	AFTER S2R2 RETROFIT
Core Rejection Rate	Inconsistent and high	Reduced significantly through in-process correction
Temperature Monitoring	None	Real-time, dual-zone visibility
Electrical Fault Detection	Post-failure response	Predictive, condition-based alerts
Part Count & Shift Tracking	Manual estimation	Automatically logged and visualized
Production Planning Accuracy	Guess-based	Data-driven shift planning
CapEx Investment	₹1.5 lakh per machine (planned)	₹0 – system extended, not replaced

➔ Key Operational Benefits



Defect Reduction

- Temperature drift was previously undetected. With live zone-level monitoring, the operator could identify and correct imbalances during the shift, leading to better quality output.



Predictive Maintenance

- Real-time current monitoring enabled early detection of coil degradation. Maintenance teams could now schedule replacements based on load profiles—not just wait for failure.



Digitized Production Planning

- Part counts were previously captured manually, leading to discrepancies. Now, each shot is counted and logged, supporting better shift planning and enabling accurate output reporting.



Cost Avoidance

- The client had been preparing to replace the Messung PLC at a cost of ₹1.5 lakh per machine. By retaining the hardware and simply extending its visibility, this capital expense was entirely avoided.



Empowered Shopfloor Team

- Operators now had a clear visual display of machine performance, enabling in-shift decisions without dependence on maintenance teams.

Implementation Timeline

DAY	ACTIVITY
1	Signal mapping and machine audit
2–3	Sensor installation and logic setup
4	Dashboard integration and testing
5	Live activation and operator training

There was no production stoppage during the implementation period.



Why This Retrofit Worked

- **Low CapEx, High ROI:** Delivered performance insights without hardware replacement
- **No Disruption:** Zero impact on ongoing production or shift planning
- **Plug-and-Play Intelligence:** Delivered visibility without rewiring or PLC edits
- **Team-Centric:** Designed for actual users—operators, planners, and maintenance heads
- **Rapid Deployment:** Full digital readiness in under a week



Broader Manufacturing Impact

- This deployment demonstrates that legacy equipment isn't obsolete—it's simply underutilized. Many Tier-2 Indian factories are sitting on machines that can deliver higher quality and better efficiency—if connected intelligently.
- S2R2's approach avoids costly upgrades and instead focuses on extracting more value from existing assets, in line with the practical constraints of mid-sized manufacturers.

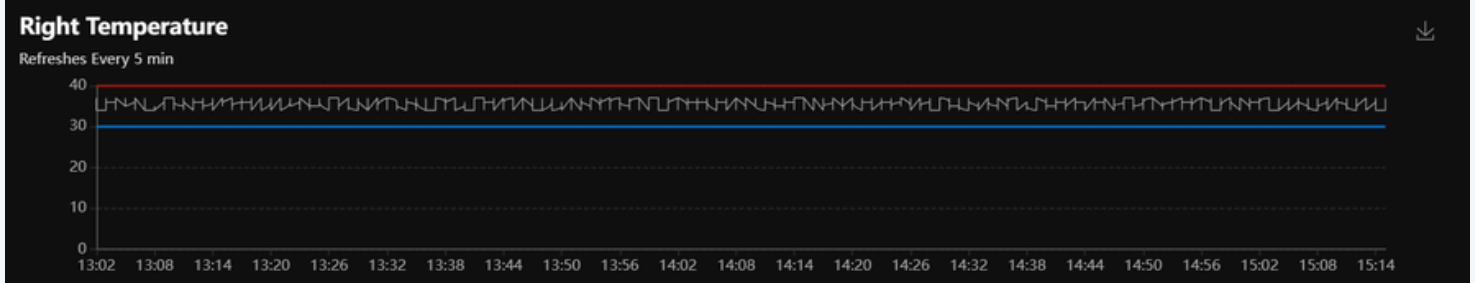
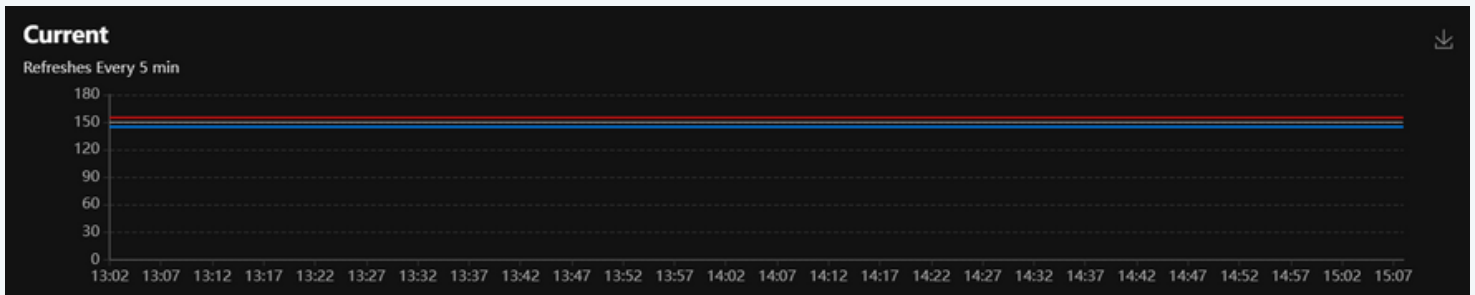
Conclusion

A Blueprint for Legacy Modernization

For manufacturers facing similar challenges—aging machines, rising defects, uncertain planning—the path to improvement does not require capital-heavy upgrades. A simple, intelligent layer of monitoring and visibility can create the operational clarity required to:

- Reduce scrap and downtime
- Improve shift-level predictability
- Enable proactive maintenance
- Avoid unnecessary equipment replacement

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This case study is based on a real implementation of S2R2's industrial IoT solution in the Indian manufacturing sector. While specific client names and identifiers have been withheld to maintain confidentiality, all technical details, outcomes, and metrics represent actual deployment results verified by the end-user. Outcomes may vary depending on plant conditions, equipment types, and operational practices. S2R2 does not guarantee identical results across all environments but offers customized solutions based on each client's unique needs.