Industrial Furnace Use Case

Embedded HMI for OEM furnaces with automotive traceability and barcode data capture.
Industry: Manufacturing / OEM

Quick Facts

Attribute	Value
Process	High-temperature metal treatment (up to 1652°F)
Data Points	1,500 to 4,000 configurable
Data Capture	Automated barcode scanning
Database	Integrated database with full traceability
Architecture	Redundant configuration available

The Challenge

Challenge: Deliver integrated control system for high-temperature industrial furnaces used in metal treatment, meeting automotive industry traceability requirements for recall management.

Specific pain points:

- Major automotive manufacturers require complete traceability for recall management
- Accountability extends throughout supply chain
- Manual data entry creates risks for human error in critical process parameters
- Lack of integrated monitoring for temperature, timing, and atmospheric conditions
- Chemical surface treatment processes require precise control

Impact: Without integrated traceability, furnace manufacturers cannot meet automotive supply chain requirements, risking disqualification as suppliers.

The Solution

Architecture

Tier	Component	Capabilities
Field	Temperature/Atmosphere Sensors	Process monitoring up to 1652°F
Control	PLCs/Controllers	Automated process control
HMI	Embedded FrameworX	Pre-installed with each furnace
Data Capture	Barcode Scanners	Automated data entry
Database	Integrated System	Full traceability records

Temperature / Atmosphere Sensors PLCs / Controllers HMI Software Database System Barcode Scanners Operator Interface

Process Control

Parameter	Description
Temperature	Monitoring up to 1652°F
Atmosphere	Gas control for chemical surface modification
Timing	Precise process duration control
Traceability	Complete audit trail per part

Treatment Applications

- Hardening

- Wear resistance
- Oxidation prevention
- Chemical surface modification

Key Enablers

FrameworX capabilities that made this solution possible:

Capability	Application
Embedded HMI Solution	Pre-installed software ships with each furnace unit
Automated Data Capture	Barcode-only entry eliminates human error
Full Traceability	Complete audit trail meets automotive recall requirements
Redundancy Capability	Supports redundant configurations for high-availability
Real-time Process Control	Continuous monitoring of temperature, time, atmosphere

---

The Results

- **Complete Traceability** — Delivered audit trail for automotive supply chain compliance and recall management
- **Zero Manual Entry Errors** — Eliminated data entry errors through automated barcode scanning
- **Precise Process Control** — Enabled control of chemical surface treatment processes
- **Improved Quality** — Real-time monitoring of critical parameters improved product quality
- **Scalable Solution** — Supports operations from 1,500 to 4,000 monitoring points
- **Reduced Liability** — Comprehensive process documentation reduced manufacturer liability risks

---

This case demonstrates embedded HMI solution for OEM furnace manufacturers with automotive traceability requirements.