Strip Rolling Furnace Use Case

Level 2 advanced control with .NET DLL integration for steel slab reheating optimization.
Industry: Steel and Materials

Quick Facts

Attribute	Value
Scale	200,000+ internal tags
Furnaces	5 reheating furnaces
PLCs	Siemens controllers
Integration	SAP, LIMAB Laboratory, TCP/IP Level 1
Architecture	Level 2 control with .NET DLL algorithms
Operation	24x7 continuous steel processing

The Challenge

Challenge: Implement Level 2 advanced control system for steel slab reheating across 5 furnaces with precise temperature control, fuel optimization, and full integration with SAP and laboratory systems.

Specific pain points:

- Steel slabs require precise temperature control for different alloy types and applications
- Manual recipe management inefficient for 24x7 operations
- Lack of integrated control between charging, tracking, and discharging processes
- Need for fuel optimization while maintaining product quality
- Disconnected systems between SAP, laboratory data, and Level 1 control

Impact: Inefficient furnace operation leading to increased fuel consumption, quality variations, and limited production throughput in continuous steel processing operations.

The Solution

Architecture

Tier	Component	Capabilities
Level 1	Siemens PLCs (5 furnaces)	Real-time furnace control
Level 2	FrameworX Enterprise	Advanced control algorithms, recipe management
.NET DLL Layer	Custom algorithms	Temperature and fuel optimization
Integration	SAP, LIMAB Lab	Recipe data, quality feedback
Clients	Control room + field stations	24x7 operator interface

Simplified diagram:

Operator Stations Control Room + Field **FrameworX Enterprise** (Level 2 Control) **.NET DLL Layer** (Temperature & Fuel Algorithms) **Integration Layer** 200,000+ Tags **SAP Siemens PLCs** (5 Furnaces) **LIMAB Lab** TCP/IP Level 1

Core Functionality

Function	Description
Charging Control	Weight validation, measurement, SAP data verification
In-Furnace Tracking	Real-time slab position and status monitoring
Discharging Control	Coordinated slab extraction and handoff

Temperature Calculation	Advanced algorithms for optimal heating profiles
Fuel Optimization	Minimized consumption while maintaining quality

Connectivity

System	Protocol/Interface
Siemens PLCs	TCP/IP Level 1 integration
SAP	Enterprise integration
LIMAB Laboratory	Proprietary laboratory system interface

Key Enablers

FrameworX capabilities that made this solution possible:

Capability	Application
.NET DLL Integration	Native support for custom control algorithms (migrated from C++)
Massive Tag Management	200,000+ tags with real-time performance
Multi-Protocol Support	Siemens PLCs, TCP/IP Level 1, laboratory interfaces
Advanced UI Components	Complex grids with color-coding for slab status and positioning
24x7 Reliability	Continuous operation for steel production

The Results

- **Unified Furnace Control** — Achieved integrated control across 5 furnaces from single platform
- **Real-time Slab Tracking** — Enabled tracking of all slabs through complete furnace cycle
- **Optimized Fuel Consumption** — Reduced fuel usage through advanced temperature algorithms
- **24x7 Reliability** — Maintained continuous operation for steel production
- **System Integration** — Connected previously disconnected SAP, Laboratory, and Level 1 systems
- **Algorithm Migration** — Successfully migrated C++ algorithms to .NET DLLs within FrameworX

This case demonstrates Level 2 advanced control for steel reheating furnaces with .NET DLL algorithm integration and enterprise system connectivity.