

NEX TECH

Plant Electrical & PLC Automation Implementation

NexTurner Technologies Private Limited

Project Type Plant Electrical & PLC Automation Implementation	Scope Field electrical, control panels, PLC control & oven automation	Delivery Full testing, commissioning & customer operation verification
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PROJECT OVERVIEW

NEX TECH: Industrial Electrical & Automation

A comprehensive plant-level engagement covering field electrical installation, control panel integration, PLC-based equipment control, and process oven automation — delivered end-to-end by NexTurner Technologies.

Project Type

Plant Electrical & PLC Automation Implementation — encompassing hardware integration, software control logic, and full commissioning support.

Scope Summary

- Field electrical installation & equipment connections
- Control panel integration & termination
- PLC-based equipment control & process sequencing
- Oven automation with safety interlocking
- Comprehensive testing & commissioning

Project Focus Areas

Field Electrical

Power, control, sensor & actuator wiring across the plant floor

Control Integration

Panel termination, signal routing, and equipment interfacing

PLC Automation

Sequence programming, interlocking logic & alarm management

Commissioning

I/O verification, sequence validation & operator handover



THE CHALLENGE

Engineering Problems That Demanded a Structured Solution

NEX TECH plant operations required resolution of six interconnected engineering challenges spanning electrical infrastructure, control architecture, and long-term digital scalability.

1

Integrated Electrical Infrastructure

Establishing a unified plant electrical infrastructure capable of supporting coordinated, multi-equipment operation across the facility.

2

Centralized PLC Control

Implementing a single, centralized PLC control system interfacing reliably across multiple field devices and diverse equipment types.

3

Process Sequencing & Interlocking

Automating complex process sequences with precise equipment interlocking and safety control logic to prevent operational faults.

4

Alarm & Fault Monitoring

Ensuring reliable, plant-wide alarm generation and fault detection across all connected equipment and control nodes.

5

Maintainability Architecture

Creating a structured control architecture that simplifies troubleshooting, reduces downtime, and supports long-term maintenance efficiency.

6

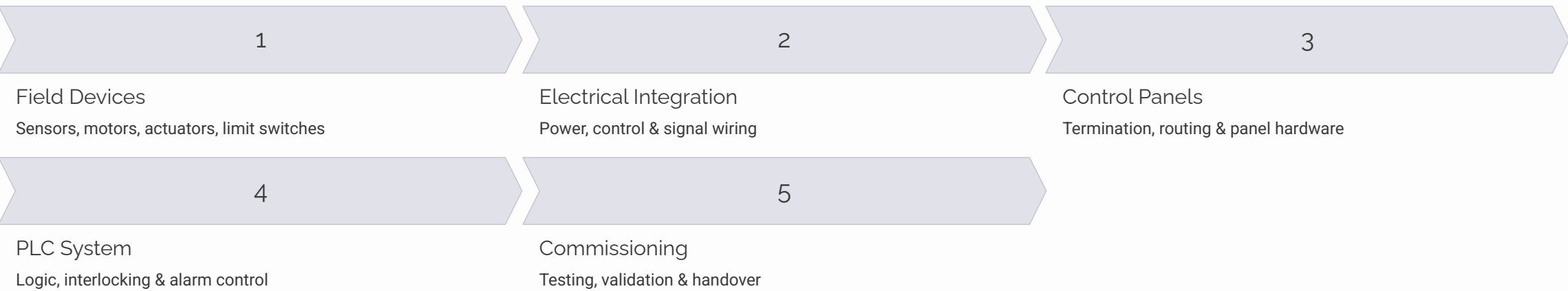
SCADA & IIoT Foundation

Building a future-ready automation foundation enabling seamless integration with SCADA and Industrial Internet of Things platforms.

SOLUTION ARCHITECTURE

NexTurner's Complete Solution

An integrated scope of work spanning four engineering domains – from field-level wiring through PLC programming to commissioning validation – delivering a fully operational plant automation system.



Field Electrical Installation

Power wiring, control wiring, sensor wiring, actuator wiring, and all equipment connections across the plant floor – structured for long-term reliability and maintainability.

PLC Control Panel

Equipment integration, signal processing, interlocking logic, and alarm generation – centralizing all control intelligence in a single, managed system.

Oven Automation

Temperature monitoring, heating control, process sequencing, and safety interlocking – delivering precise, automated oven operation with manual override capability.

Testing & Commissioning

End-to-end electrical testing, I/O verification, sequence validation, and customer operation verification ensuring a production-ready handover.



ELECTRICAL ENGINEERING

Electrical Engineering & Field Integration

Integration Architecture

01

Field Equipment

Motors, heaters, sensors, actuators, and limit switches identified and mapped

02

Power & Control Wiring

Structured cabling routes installed across the plant floor

03

Panel Termination

All cables terminated, labeled, and verified at the control panel

04

PLC Control Panel

Field signals interfaced with PLC I/O for centralized control

05

Coordinated Operation

All equipment operating under unified PLC supervision

Key Field Engineering Activities

Field Electrical Installation

Complete installation of all plant-floor electrical infrastructure – conduits, trays, and wiring routes for power and control circuits.

Equipment Connections

All field equipment connected to the control system: motors, heaters, fan drives, and actuation devices.

Sensor & Actuator Wiring

Temperature sensors, proximity switches, limit switches, and actuator wiring – signal integrity maintained throughout.

Panel Termination & Cable ID

Systematic cable identification, ferrule marking, and termination practices for simplified fault diagnosis.

Electrical Testing & Troubleshooting

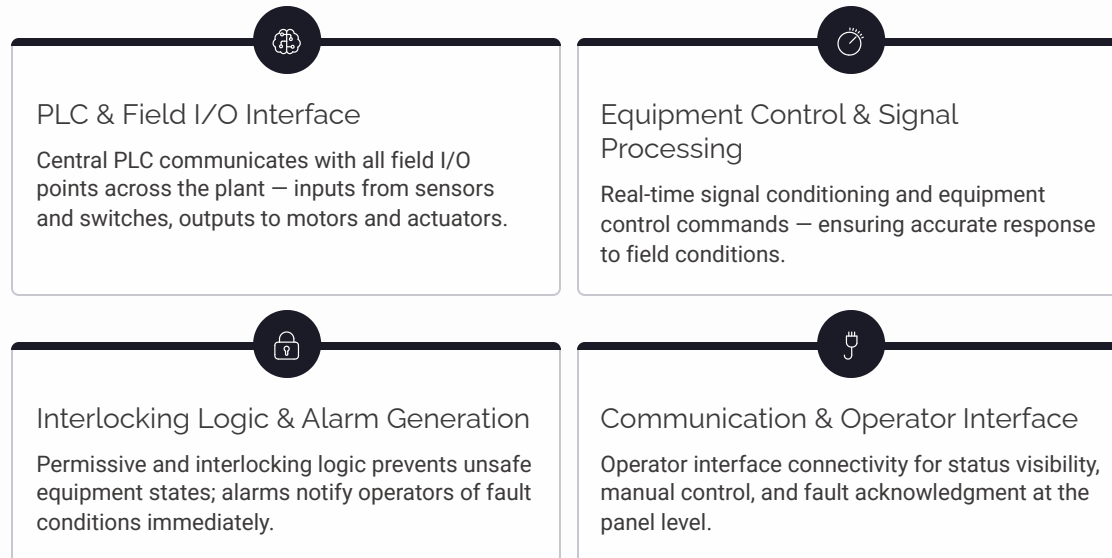
Continuity checks, insulation resistance testing, and circuit verification performed before energization to ensure safe and reliable operation.

CONTROL SYSTEMS

PLC Control Panel & Oven Automation

Two core control subsystems deliver plant-wide automation: the central PLC Control Panel governing all equipment interaction, and the dedicated Oven Automation system managing thermal process integrity.

PLC Control Panel Functions



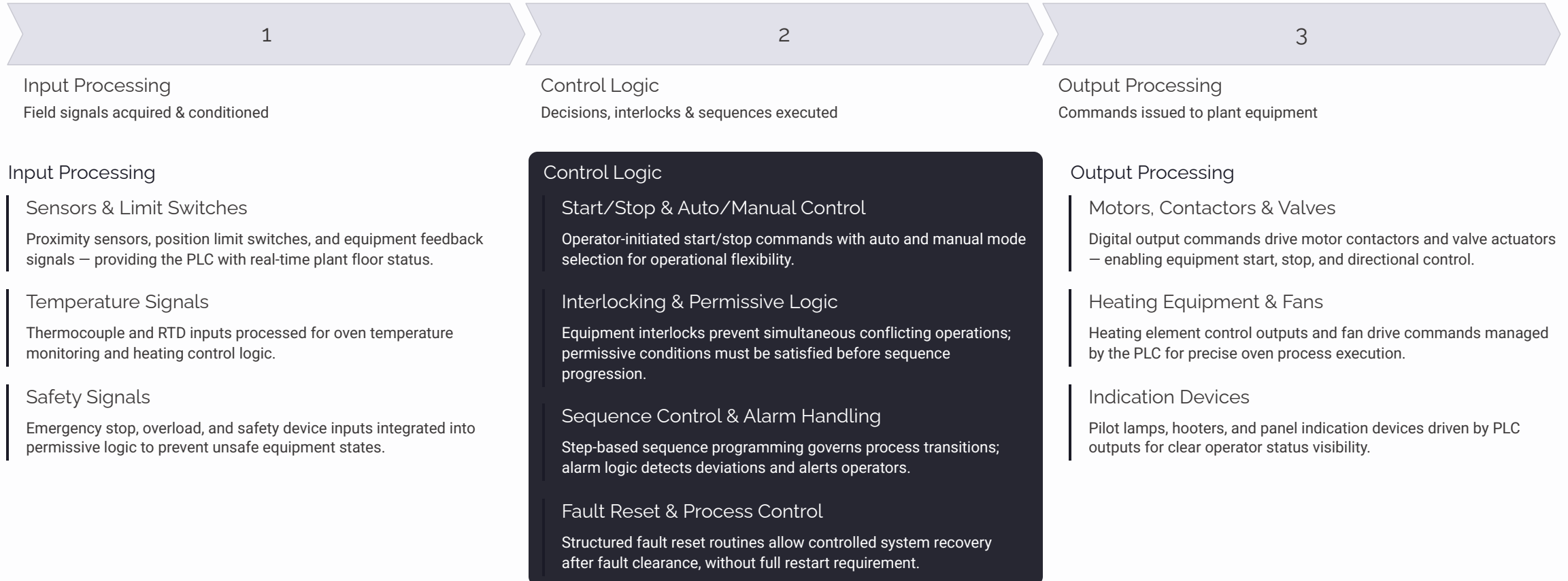
Oven Automation Functions



PLC PROGRAMMING

PLC Programming & Control Logic

The PLC program structures plant-floor control into three layers – input acquisition, control logic execution, and output actuation – creating a reliable, maintainable, and deterministic automation system.

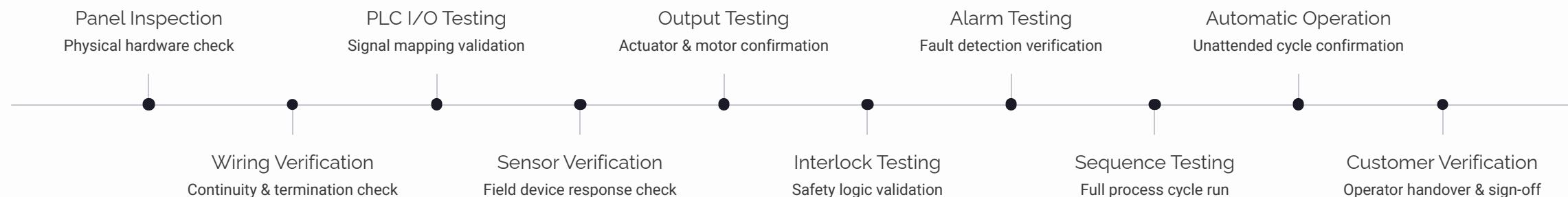




COMMISSIONING

Testing, Commissioning & Project Outcome

A structured ten-stage commissioning workflow was executed to validate every layer of the automation system — from physical panel inspection through to full customer operation verification and handover.



Project Outcomes

Structured Automation Architecture

Coordinated equipment operation delivered through a clearly structured PLC-based control system across the plant.

Reliable Process Control

Improved equipment coordination with deterministic PLC logic replacing manual or ad-hoc control methods.

Enhanced Fault Monitoring

Comprehensive alarm and fault visibility enabling faster diagnosis and reduced mean time to recovery.

Operational Reliability

Improved system stability and operational consistency across plant equipment — reducing unplanned interventions.

SCADA & IIoT Ready

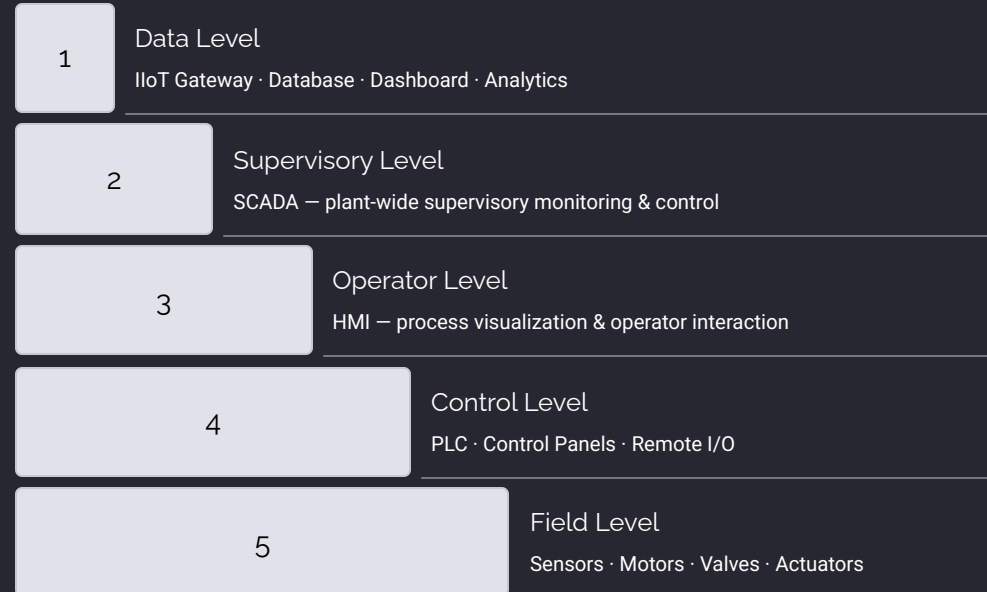
Architecture designed from the outset to support future SCADA supervisory integration and IIoT data connectivity.



Automation Architecture & Digitalization Roadmap

The NEX TECH implementation establishes a five-level automation hierarchy aligned with ISA-95 industrial standards — creating a clear pathway from field-level sensing to enterprise-level smart manufacturing analytics.

System Hierarchy — Five Levels



Digital Transformation Journey

01

Field Automation

Plant electrical infrastructure and field device integration — **completed in this project.**

02

PLC Control

Centralized PLC logic, interlocking, and sequence automation — **completed in this project.**

03

HMI Integration

Operator touchscreen interface for process visualization and manual intervention — **next phase.**

04

SCADA Deployment

Plant-wide supervisory control and data acquisition — historical trending and centralized monitoring.

05

IIoT Connectivity

Cloud gateway integration enabling remote monitoring, analytics, and predictive insights.

06

Production Monitoring

Real-time OEE tracking, downtime analysis, and production KPI dashboards.

07

Smart Manufacturing

Data-driven decisions, adaptive control, and fully connected intelligent plant operations.



NEXTURNER TECHNOLOGIES

From Electrical Engineering to Intelligent Automation

NexTurner Technologies delivers end-to-end industrial automation capability across four integrated engineering pillars — from the first field cable to the final data dashboard.



Field Engineering

Electrical installation, structured wiring, cable identification, and complete equipment integration from field devices to control panels.



Control Engineering

PLC control panel design, I/O integration, signal processing, interlocking logic, and plant-wide equipment control architecture.



Process Automation

Sequence control programming, safety interlocking, oven automation, alarm management, and auto/manual process operation.



Digital Readiness

SCADA-ready architecture, IIoT connectivity foundations, and the system structure required for connected, smart manufacturing.

Building Reliable Automation Systems for the Future of Manufacturing

NexTurner Technologies Private Limited