

CASESTUDY



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**PROVISION OF EI-BASED
AUTOMATIC SIGNALLING OF
A HIGH-DENSITY RAIL
CORRIDOR**





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THE CLIENT

The client for this project is a Zonal Railway under the Ministry of Railways, responsible for one of the busiest High Density Network (HDN) corridors on Indian Railways – a stretch running through a heavily industrialized belt with rising freight and passenger demand across all service categories.

To modernize signalling on this critical rail corridor, the Railway required a partner capable of EPC-scale execution – engineering, procurement, and construction – across signalling, telecom, and interlocking systems, delivered to RDSO specification. MASL World stepped in as that execution partner.





THE CHALLENGE

Before this project, the corridor faced several constraints:

- Two of the four lines were still running on an older block-working system, while the other two had already moved to Automatic Signalling — creating a mismatch in capacity across the same corridor.
- Line capacity was approaching saturation, driven by increasing freight and passenger traffic on one of Indian Railways' busiest routes.
- The junction station was mid-transition to a new interlocking system, replacing its older relay-based setup — any new signalling solution had to work around and with this in-progress change.
- The terminal station's existing relay interlocking system needed modification to support Automatic Signalling without disrupting live train movement.
- Several level crossing gates along the route remained non-interlocked, a legacy safety gap that needed closing as part of the modernization.
- The corridor needed stronger redundancy across detection, power, and communication — to meet modern safety and reliability standards, not just add capacity.



THE SEARCH

The Railway needed a partner capable of end-to-end delivery: **survey, design, supply, installation, testing, and commissioning** — for a safety-critical signalling upgrade.

The scope demanded **proven capability** across multiple disciplines at once: train detection systems, interlocking, power infrastructure, communication networks, and field installation — all coordinated without disrupting live traffic on a high-density route.

MASL World was selected as the **execution partner** for the project based on its systems integration expertise and track record of delivering large-scale infrastructure projects for government and public sector clients.





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SCOPE OF WORK

The scope covered full design, supply, installation, testing, and commissioning of the Automatic Section across 80+ km and 10 stations:

Automatic Signalling Conversion:

- Conversion of the older block-working lines into Automatic Signalling, keeping existing directionality intact
- Provision of signals at all main line stations and gates within the automatic section

Train Detection Systems:

- Supply, design, testing, and commissioning of a redundant digital train detection system across all track sections
- Automatic and manual resetting arrangements built in line with Railway practice



Interlocking Systems:

- Design, manufacture, and supply of interlocking systems with standby capability at relay locations along the route
- Interlocking implementation at the corridor's junction station, integrated with its ongoing modernization
- Modification of the interlocking system at the corridor's terminal station for compatibility with Automatic Signalling

Communication & Power Infrastructure:

- A redundant fibre communication network linking all signal cabins and stations along the corridor
- An integrated power supply system with built-in redundancy to keep interlocking systems running without interruption

Field & Civil Works:

- Supply and laying of signaling cables and communication fiber across the corridor
- Signal erection, relay racks, and earthing systems installed across all sites

Testing & Documentation:

- Thorough testing at every station, jointly signed off with Railway engineers before commissioning

Safety Systems:

- Fire detection and alarm systems installed at every relay location along the corridor – Interlocking of previously non
- interlocked level crossing gates with modern lifting barrier arrangements





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THE SOLUTION

MASL World's implementation combined fail-safe engineering with a redundancy-first design philosophy — ensuring the corridor could scale traffic capacity without introducing new points of failure.

The solution was built around three priorities: eliminating the older block-working bottleneck, integrating cleanly with the junction and terminal stations' existing interlocking systems, and building redundancy into every critical subsystem.





Redundant Train Detection:

Every detection point was provisioned with a backup, so if one path fails, the other takes over. Availability is engineered in, not assumed.

Standby Interlocking Architecture:

The interlocking system deployed runs on a hot-standby setup, so a single fault affects only part of the system, never the whole corridor.

Redundant Fibre Backbone:

All stations and cabins were linked through a dual fibre network laid along separate paths — so a single cable fault can't isolate a section of the corridor.





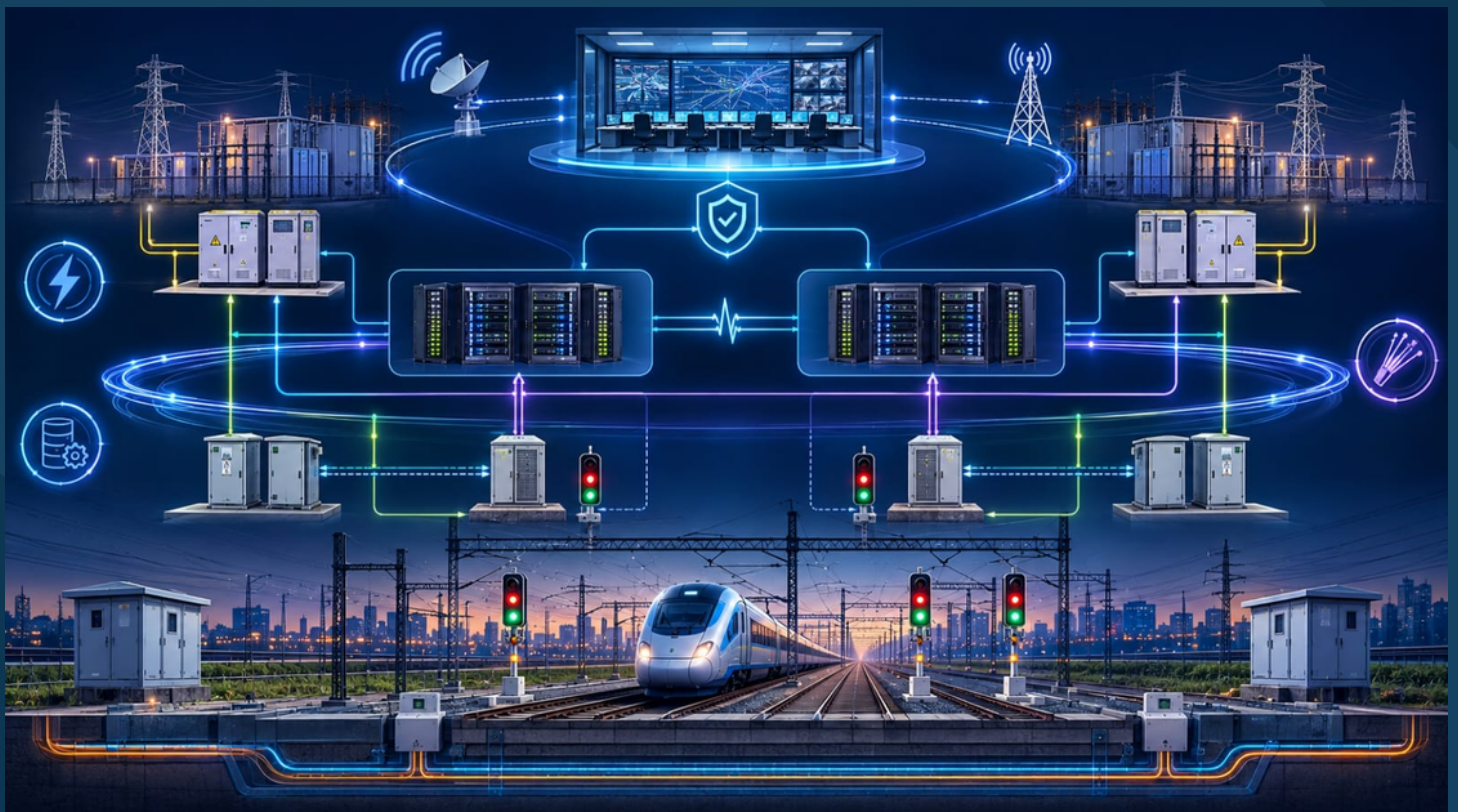
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Resilient Power Supply:

Power systems were deployed with built-in redundancy, so a fault on one side never takes down the whole system.

Automatic & Manual Resetting:

The resetting design ensures that if one section fails while its paired section clears, the system resets itself automatically — minimizing manual intervention without compromising safety.



By engineering redundancy into every layer — detection, interlocking, power, and communication — MASL World delivered a corridor upgrade built not just to add capacity, but to fail safely when something inevitably goes wrong somewhere in an 80+ kilometre system.





THE OUTCOME

The Automatic Signalling upgrade delivered a corridor re-engineered for both current traffic density and future growth — aligned directly with the Railway's objectives for the section.



Increased Line Capacity:

Converting the older block-working lines to Automatic Signalling directly addresses the saturation pressure building on this high-density route — enabling more trains to move safely through the same physical infrastructure.

Stronger Safety Margins:

Modern interlocking and redundant train detection raise the corridor's safety baseline well beyond what the older system could offer.

Built-In Scalability:

The system was designed to absorb future growth in field equipment without requiring a redesign from scratch.

Reduced Failure Risk:

Redundant power, communication, and detection systems mean single-component failures no longer translate into service disruption.



THE IMPACT



“ This case study highlights MASL World's role in re engineering a critical high-density rail corridor — converting an older block-working system to fully redundant Automatic Signalling across 10 stations, without compromising live operations or safety standards.”





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