

Enhancing Port Reliability through Control & Automation





A legacy^{of} *Excellence*

Larsen & Toubro is a multi-billion-dollar technology, engineering, construction, manufacturing and services conglomerate, with global operations. Across seven decades, it has acquired expertise in addressing the needs of critical sectors – including infrastructure, construction, process plant equipment, petrochemicals, defence, aerospace, power, ship-building and metallurgy.

A dependable *Partner*

L&T's Control & Automation business has over three decades of experience in delivering comprehensive customized Electrical & Automation solutions, based on various technology platforms, to diverse industry segments worldwide. These include system design, plant engineering, system integration, project management, installation, commissioning, site management and life-cycle services. A reputation for quality, innovative solutions and strong customer orientation characterize L&T's offerings. A talented, experienced team of engineers with robust software development skills offer solutions from sensor to boardroom.



360° Solutions



L&T's 360° control and automation solutions for ports range from concept to commissioning. These enable ports to monitor, control and manage operations with enhanced reliability. L&T's integrated engineered systems increase efficiency, capacity and productivity, and reduce the total overheads of loading, unloading, storage, processing and distribution.

Applications

- Bulk material handling
- Container Operations
- Liquid Cargo Handling

Solutions: L&T's systems power and control port equipment such as:

- Ship loaders / unloaders
- Rail Mounted Quay Cranes / Rubber Tyre Gantry Cranes
- Conveyors
- Stackers / Reclaimers
- Truck or wagon loading / unloading including wagon tippler

Total Competency, Total Solutions

| Domain Knowledge | The L&T Advantage |
|-----------------------|--|
| System Design | Efficient, robust and reliable system design, resource optimisation and high safety standards. |
| Integration expertise | Team of subject matter experts, with in-depth knowledge of processes and engineering practices, ensures seamlessly integrated, end-to-end solutions. |
| Site Management | Efficient and dedicated pool of engineers with a track record of timely completion. |
| Life-cycle Services | 24x7 support, maintenance, replacement, repair, spare parts supply and upgrade. |

L&T has designed and commissioned systems for various ports across India.



Systems that boost reliability

Bulk Material Cargo Handling

L&T's tailor-made solutions enable port operators to achieve a throughput of 100 million tonnes of bulk material cargo each year. With comprehensive knowledge and specific sector know-how, L&T delivers highly robust and reliable systems to meet a port's specific requirements while complying with the highest safety practices.

L&T's electrical and automation solutions include:

- Drives and motors
- Conveyor instrumentation
- Control products and PLCs (programmable logic controllers)
- SCADA systems (Supervisory Control and Data Acquisitions)
- Low-voltage, medium-voltage and high-voltage switchgear and components

- Transformers
- Security & surveillance, perimeter & Intrusion detection
- Communication networks
- Optimization and asset management solutions

A wide range of services in engineering, consulting, construction and maintenance complement L&T's product portfolio.

Container Handling

The container shipping industry, the backbone of the global economy supply chain, continues to grow, adapt, and change rapidly. All operations must run smoothly and reliably, 24/7, 365 days a year – and reliability is of the highest importance. Power distribution and data transmission systems play a critical role in container operations, and they receive special attention from operators, equipment manufacturers and consulting engineers alike. L&T's systems are designed to offer long-term efficiency, safety, ease of maintenance, and are hence cost-effective.

Containerised Sub-station:

To enable a port to operate efficiently even during the construction period, it is essential to ensure early deployment of electrical systems. To meet the need for faster installation of power conversion and evacuation infrastructure, L&T offers the **G-RayStation** Solution. It is a container-based compact substation equipped with inverters, transformers, medium voltage switchgear, metering, surge arresters, protection and control equipment, auxiliary power and control system. The G-Ray is designed to meet the power requirements of container yards, cranes and other applications involving mobility.



Liquid Cargo Handling – Terminal Operations

L&T's Integrated Terminal Solution delivers value from conception to implementation and operation for liquid terminals such as refinery off-sites, fuel storage and distribution sites, petrochemical storage, loading facilities and marine, rail and truck loading.

Combining the latest technology with proven design enables L&T to offer the most advanced and adaptable Terminal Automation Software – **iVision_{max}** – to automate and control liquid terminals.

Terminal Automation Systems Features

- Electrical Power Distribution System
- Process Control and Safety PLC System
- Wagon Loading Automation
- Tank Farm Management System
- Surveillance, Public address and Fire Detection & Alarm System
- ERP Integration
- Business Intelligence Solution
- Mobility Management Solution



Integrated Port Information Management System (IPIMS)

L&T's IPIMS provides real-time data to operators, enabling them to make smart decisions in order to minimise operation costs. This includes seamless integration of data available from various sources, such as:

- Cranes
- Tugs/dredgers
- GPS
- Liquid terminals
- Hopper
- Conveyor systems
- Fuel management systems
- Energy management systems
- Grab unloaders
- GIS
- ERP
- Logistics management systems
- Planning systems

L&T's IPIMS creates real-time dashboards which help users to take the right decision to achieve operational excellence. It delivers major port performance indicators, such as:

- Turnaround times of crane operations
- Truck/vessel movements
- Yard production
- Stock positions
- Day/night productivity
- Delay analysis
- Equipment/berth/ labour utilisation, cycle times

It provides input for negotiations on port congestion, surcharges, port development, port tariff and justification for further investment decisions.

Benefits:

- Operation visibility and awareness
- Financial and operation integration
- Maximise asset/resource utilisation
- Condition based maintenance
- Knowledge management
- Capacity planning

Surveillance and Situational Awareness

Ports face reputational risks like smuggling, theft, breaches in cargo control and terrorist attacks. To protect assets and increase safety levels for workers, port operators are adopting technologies like access control systems, CCTV and perimeter protection solutions. L&T's video analytics solution – **iVision_{max} – VAS** – offers a variety of applications to meet the needs of port security and surveillance.

It identifies events, attributes or patterns of behaviour through video analysis of recorded situations. It helps port operators to monitor video streams in real-time, automatically generates alerts and facilitates forensic analysis of historical data to identify specific incidents, trends and patterns to keep people safe by preventing accidents and criminal activities. Video analytics can be used to:

- Raise safety alerts, such as when a person is in a prohibited zone
- Recognise license plates on vehicles
- Identify known offenders using facial recognition
- Detect suspicious or abnormal behaviour
- Share information via smart phone camera images
- Monitor vehicle movements (restricted area, intrusion, unauthorised entry, unauthorised vessel crew)
- Analyse past events, including combining footage from multiple cameras



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Control & Automation

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