

SMART MATERIAL HANDLING

AUTOMATIC CRANES

The Way to Lift Your Ideas



ets[®]

THE COMPANY

ETS ENGINEERING SPA IS A LEADING COMPANY
IN THE DESIGN AND MANUFACTURING OF AUTOMATIC CRANES

ETS Engineering S.p.A. designs and manufactures lifting equipment, offering clients comprehensive support in the development of prototypes and industrial projects. The company offers a highly qualified technical staff, working with the most advanced CAD and 3D design technologies.

Thanks to its extensive experience in the sector, ETS Engineering S.p.A. also specializes in the design and manufacturing of special cranes and automated systems, custom-developed to meet the diverse needs of our clients.

ETS has been a global leader in the production of lifting systems for 50 years. A production facility of over 10,000 m², cutting-edge design systems, and a highly trained and qualified staff.



QUALITY

ETS IS COMMITTED TO ENSURING THE “FITNESS FOR USE” OF ITS CRANES AND SECURING CUSTOMER SATISFACTION

The “Integrated” View

Integrated Management System (IMS): An integrated, DNV-certified quality system encompassing production management, environmental compliance, and workplace safety guarantees the highest levels of quality.

ISO 9001: Quality Management Systems (QMS)

Focus: The Customer

Definition of Quality: It’s not about being “luxury” or “expensive”; it’s about **consistency**. If you promise a service and deliver it exactly as described every time, that is high quality.

Key Drivers: Customer Satisfaction: Does the product/service meet customer expectations?

- **Process Efficiency:** Reducing waste and errors in production.
- **Continuous Improvement:** Using the PDCA (Plan-Do-Check-Act) cycle to get better over time.

ISO 14001: Environmental Management Systems (EMS)

Focus: The Environment and Stakeholders.

Definition of Quality: Quality is defined by **environmental performance** and the prevention of pollution.

Key Drivers:

- **Life Cycle Thinking:** Considering environmental impact from raw material acquisition to final disposal.
- **Legal Compliance:** Meeting all environmental regulatory obligations.
- **Resource Management:** Efficiency in energy, water, and raw material usage.

ISO 45001: Occupational Health and Safety (OH&S)

Focus: The Worker.

Definition of Quality: Quality is measured by the **absence of injury and ill health** and the proactive improvement of the workplace environment. A “quality” workplace is one where “zero harm” is the target.

Key Drivers:

- **Hazard Identification:** Finding what could go wrong before it does.
- **Consultation and Participation:** Quality is achieved by involving workers in the decision-making process.
- **Risk Mitigation:** Applying the “Hierarchy of Controls” to eliminate or minimize danger.



CAT. 0531 CL II



ISO 9001
ISO 14001
ISO 45001

AUTOMATIC CRANES

THE BENEFITS AT A GLANCE

Reliability and high performance

- Bridge cranes enable the full utilization of entire storage area
- Constant material flow
- Radar setting to handle the material on more congested area
- Waste mixing to prepare waste for feeding into the hopper

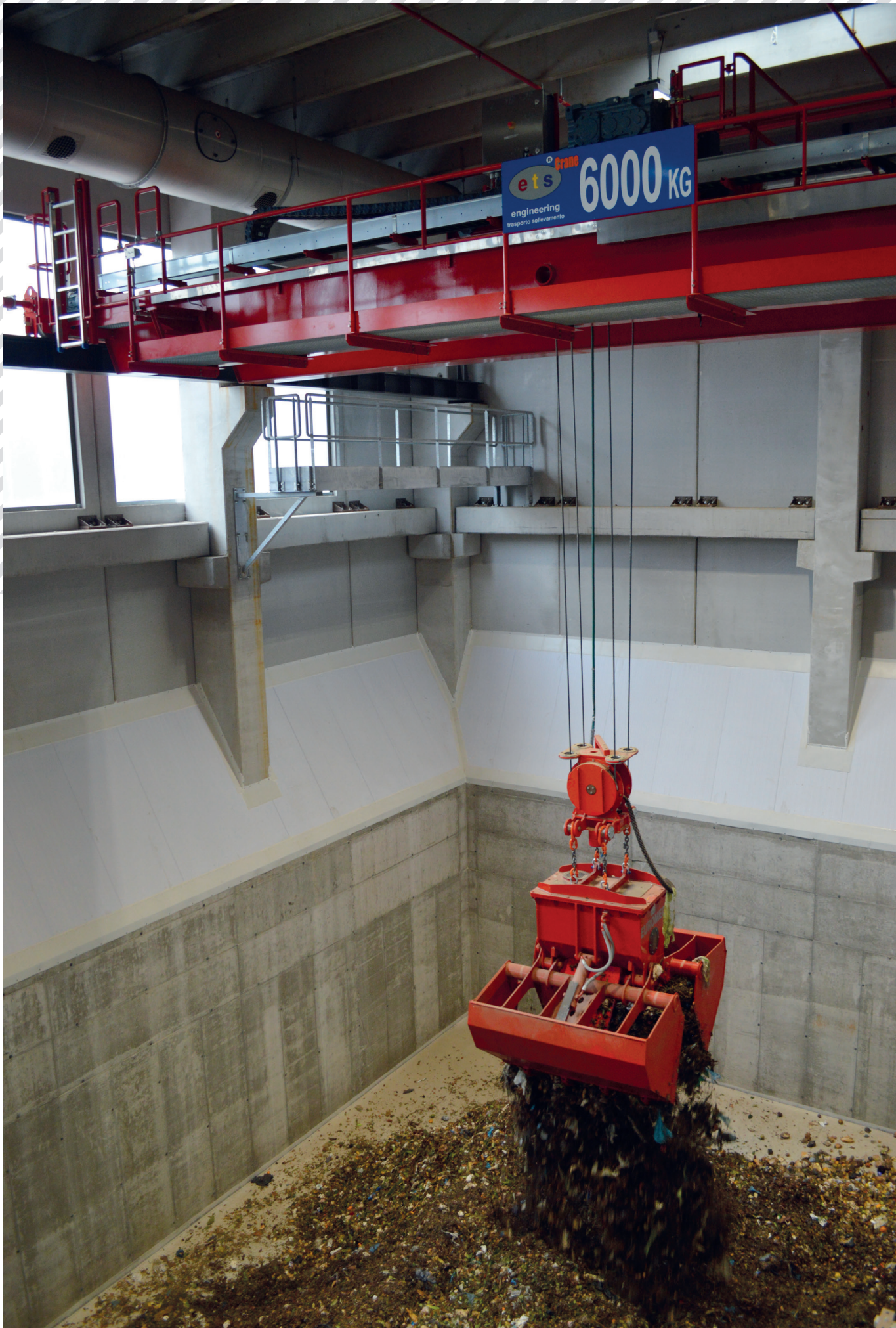
Great flexibility

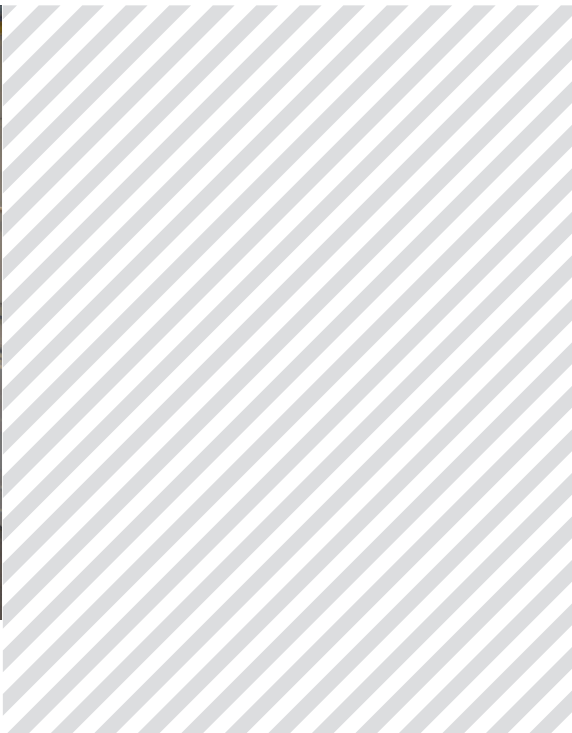
- Many solutions and options can be selected in an easy way through our software to meet specific load handling requirements
- Fully Automatic, Semi-Automatic or Manual control always available
- Intuitive and fast operating system to facilitate the work of the operators

Final Result

- Highest lifecycle of crane
- Less risk of failure
- Improved overall safety of the plant
- High volume of material processed
- Predictable maintenance cycle
- Reduction of general costs for services and spares







CRANES KEY ROLE

CRANES ARE CRUCIAL IN MODERN FACILITIES. IF THEY STOP, THE WHOLE PROCESS IS PARALYZED

Reliability and High Performance

Full Storage Area Utilization: The crane operates over a work zone (pit) organized into a matrix of cells, each the size of the grab. This allows the system to manage the entire storage area systematically.

Constant Material Flow: The system is programmed to periodically perform specific operations, such as emptying areas near discharge gates and loading the furnace feeding hopper, ensuring a steady process flow.

Radar-Driven Precision: Reliability is enhanced by **VEGAPULS radar sensors** mounted on the trolley. These sensors provide a precise, continuous mapping of material accumulation levels, which the HMI displays as fill percentages for each cell.

Material Management: The crane performs “cleaning” operations by moving material away from congested discharge gates to emptier storage cells. In “Automatic” mode, it prioritizes maintaining a level material surface across the pit.

Great Flexibility

The control systems offer significant operational flexibility:

Versatile Control Modes: The cranes support **Automatic, Semi-Automatic, and Manual** operation. Automatic cycles can be initiated directly by a DCS (Distributed Control System) or via a local **HMI touch-screen**.

Customizable Software: Through the HMI,

operators can set various parameters, including travel speeds (up to four distinct levels) and specific “interdiction zones”.

Intuitive Operator Interface: The HMI provides real-time data on grab position (X, Y, Z coordinates), load weight from cells, and inverter frequencies, making it easier for operators to monitor the system’s status.

Final Results: Safety and Maintenance

The integration of advanced monitoring leads to improved safety and longevity:

Enhanced Plant Safety: Safety is a core component of the “software safety” logic. The system includes “**PLd**” (**Performance Level d**) **safety interlocks** for access gates; if a gate is opened, the cycle automatically interrupts. Furthermore, the PLC manages **interdiction zones**—both permanent (to protect structures) and temporary (to prevent collisions with trucks in discharge areas).

Predictable Maintenance: The system tracks motor usage through an **hour and maneuver counter**, allowing for scheduled maintenance based on actual wear. It also monitors motor currents and temperatures (PTC) to detect mechanical strain or overheating before a failure occurs.

Reduced Downtime: A **tele-assistance module** allows ETS technicians to connect remotely via a secure VPN to diagnose faults or update software, which helps in organizing targeted, efficient on-site interventions.

Flexible Process Configurations

Modern handling systems, such as those developed by **E.T.S. engineering**, support a variety of operational modes to suit different plant needs:

Fully Automated: The system executes pre-defined cycles—such as pit mapping, area cleaning, and hopper loading—initiated by a **DCS (Distributed Control System)** or an **HMI (Human-Machine Interface)**.

Semi-Automatic: Operators can manually pick up material and then use automated sequences to send it to a selected hopper.

Manual/Remote Control: Cranes can be operated via a control chair or remotely through **radio control** for maintenance and specific maneuvers.

Remote Assistance: A dedicated **tele-assistance module** (connected via VPN/UMTS) allows technicians to perform remote diagnostics and software modifications, significantly reducing the risk of prolonged production stops.

Efficiency and Simultaneous Tasks

To comply with production plans throughout the entire process, the system employs several key technologies:

Real-Time Mapping: Radar sensors (type **VEGAPULS**) continuously monitor material levels within the pit, dividing the area into a matrix to optimize storage and retrieval.

Priority Management: In automatic mode, the system prioritizes DCS requests to ensure the transformation process is never starved of material.

Simultaneous Coordination: The system can manage cleaning operations near discharge doors while simultaneously handling hopper loading requests to guarantee continuous truck unloading.

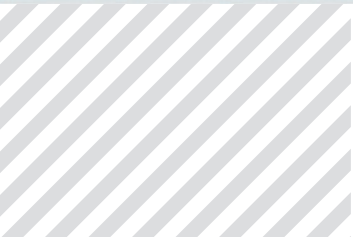
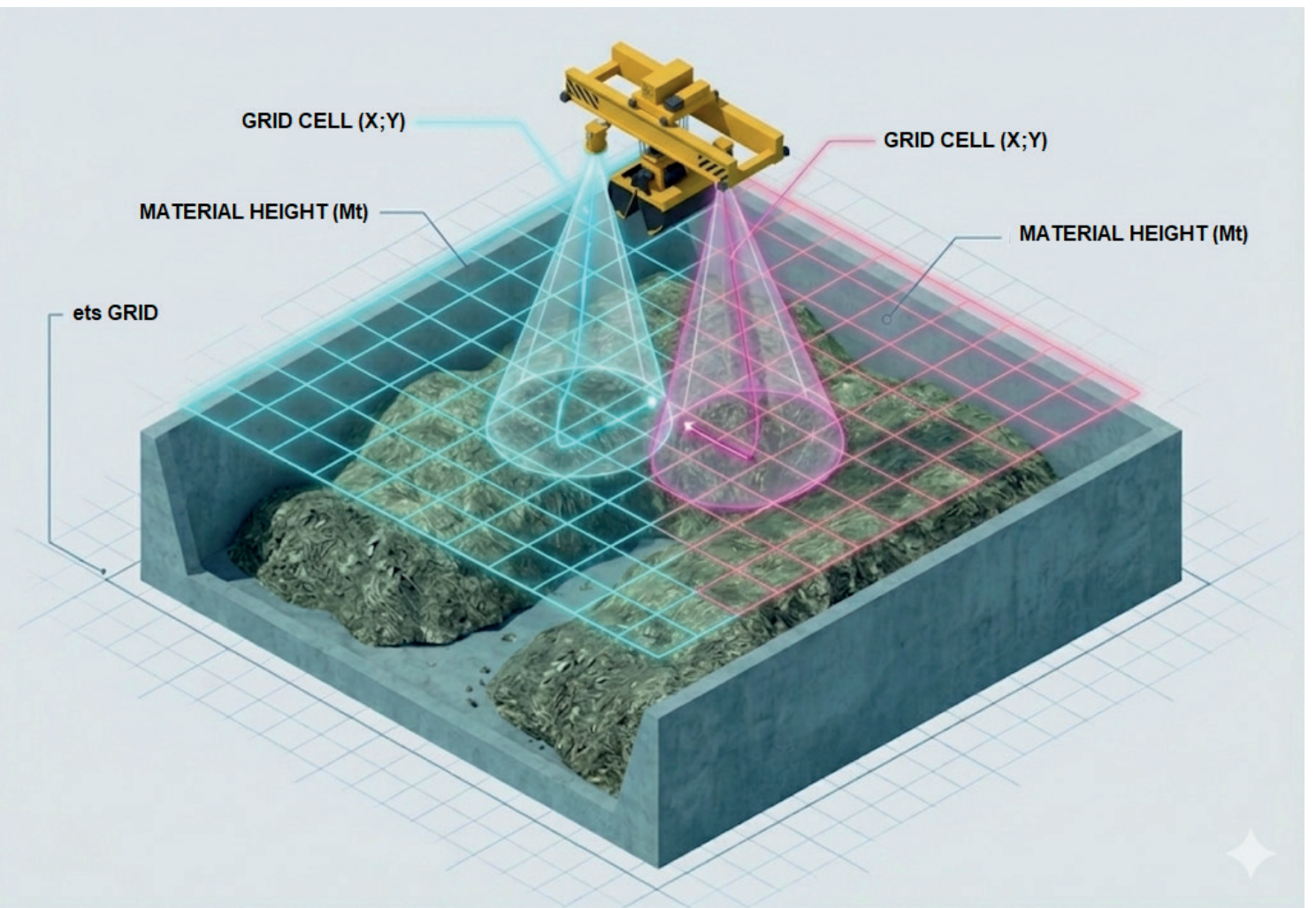
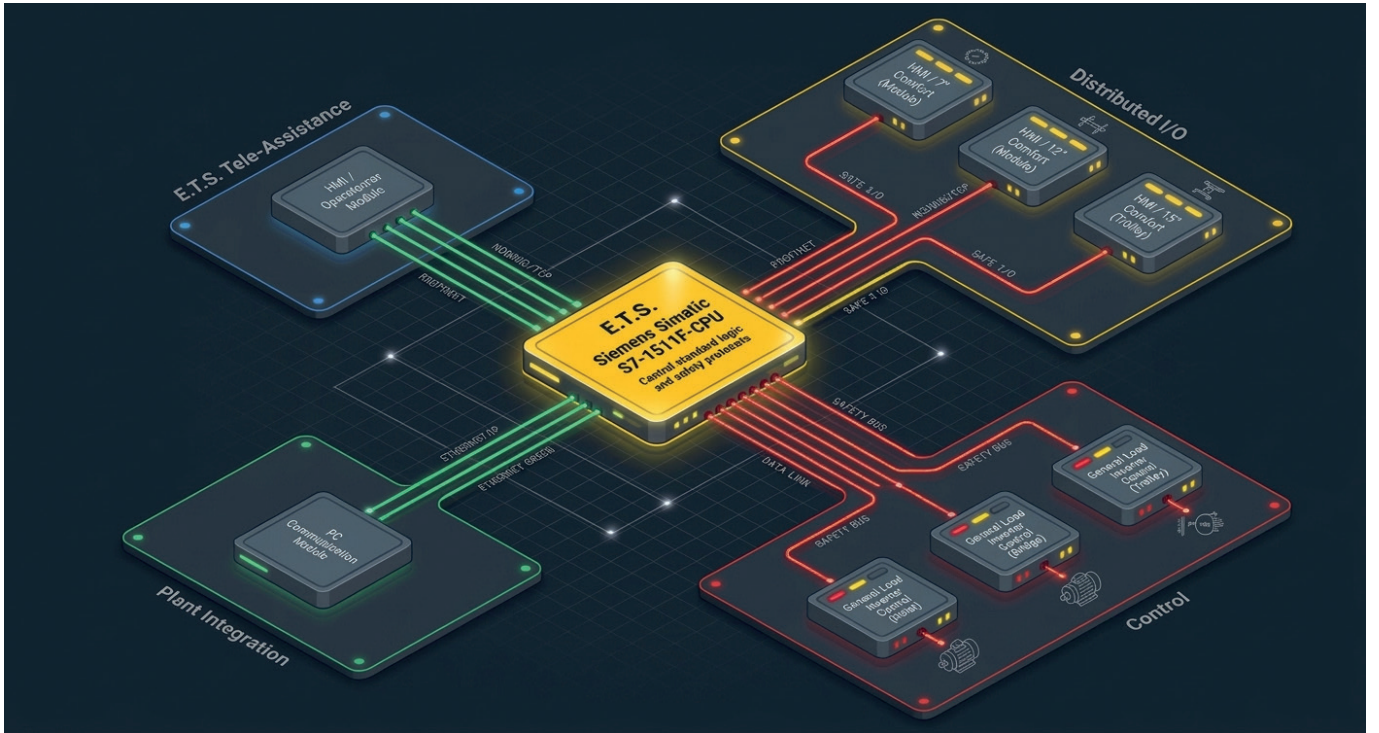
Environmental and Safety Compliance

Demanding guidelines are met through integrated safety architectures:

Safety Interlocks: The system manages **PLd (Performance Level d) safety interlocks** for gates and access points. If a safety gate is opened, the process is immediately interrupted to protect personnel.

Interdiction Zones: Operators can set permanent or temporary “no-go” zones to avoid interference with plant structures or to separate mechanical vehicles from crane operations during sourcing.







Monitoring and Reporting: The system automatically records all movements, material weights, and energy consumption, generating daily reports for full process transparency.

Precise Positioning and Safety

Precise handling and hazard reduction are achieved through integrated sensor arrays:

Positioning: The system uses **encoders** for the bridge, trolley, and hoist to track real-time coordinates (X, Y, and Z axis) with millimeter precision, which is then displayed on the operator interface.

Safety Features: To prevent accidents, the crane includes **slack rope control limit switches** and **emergency lift overtravel switches**. Safety is further reinforced by “PLd” (**Performance Level d**) **safety interlocks** on access gates; if a person enters a restricted zone, the cycle immediately interrupts.

Interdiction Zones: Software allows for the setting of **permanent interdiction zones** (to protect plant structures) and **temporary zones** (to prevent collisions with trucks or personnel during material discharge).

Performance Optimization

The cranes utilize specific software to maximize efficiency:

Adjustable Speed Range: Operators can set **four distinct speed levels** via the HMI. The system uses inverters to

manage motor frequencies, allowing for smooth acceleration and speed optimization based on the operational phase.

Automated Working Cycles: The software enables cycles such as **automatic pit mapping**, “cleaning” material away from congested discharge doors, and prioritizing hopper feeding based on real-time requests from the plant’s **DCS (Distributed Control System)**.

Remote Monitoring and Intuitive HMI

The **intuitive user interface** (HMI touch-screen) serves as the central hub for real-time data collection and visualization:

Load and Level Visualisation: The HMI displays the **current weight** in kilograms (from load cells) and the **filling levels** of storage cells as a percentage, mapped via **VEGAPULS radar sensors**.

Motion and Status: All travel movements across the X, Y, and Z axes are shown in motion, alongside **inverter frequencies** and motor status.

Alarms and Hour Evaluation: A dedicated page lists active **warnings and alarms** with time-stamps. For maintenance planning, the system includes a **hour and maneuver counter** for all primary drives (hoist, bridge, and trolley).

Remote Assistance: A **tele-assistance module** (connected via a secure VPN/4G router) allows ETS technicians to perform remote diagnostics, software updates, and fault resolution, minimizing downtime.



SERVICE AND REMOTE ASSISTANCE

EVEN THE MOST ADVANCED CRANE LOSES VALUE AND PRODUCTIVITY WITHOUT A RELIABLE AFTER-SALES SERVICE

We provide specialized maintenance services and spare parts, in order to assure the fastest way to install spares when needed and reduce at minimum plant downtime.

Our first aim is to guarantee highest standard levels on safety and productivity of our customers' operations.

That's the reason why PREVENTIVE MAINTENANCE is an essential part of the job to preserve the system always at the top. We can create a Maintenance Plan based on your equipment, application and duty cycle.

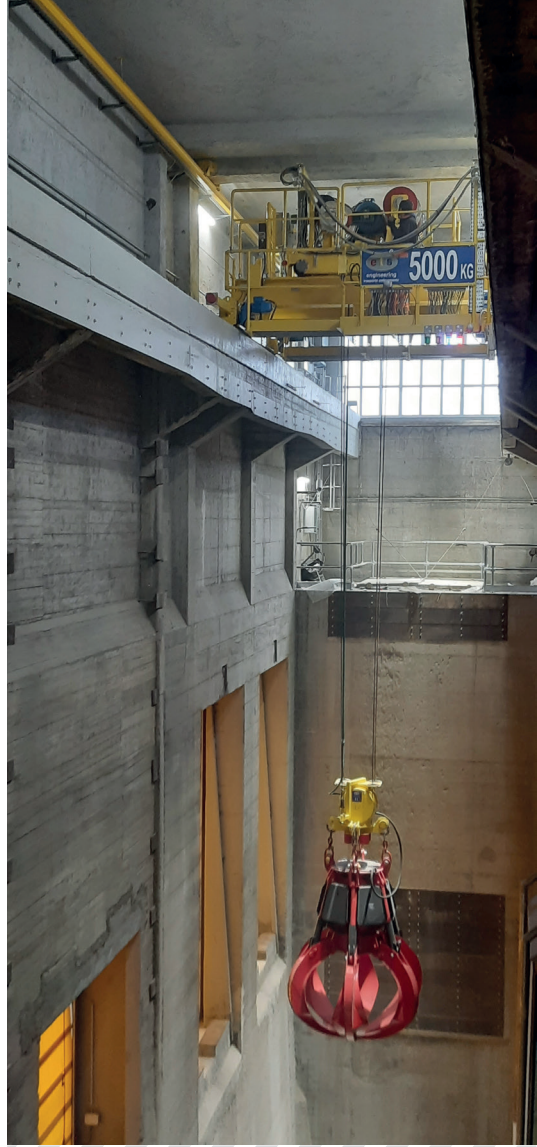
We offer:

- Spare parts
- Maintenance program
- A Full Service assistance
- Modernizations
- Training
- Urgent repair services

ETS will assure prompt assistance via Remote Control of Lifting Devices. This will generate a huge benefit for all our Customers with reduction of waiting time and minimizing of production stops and money saving.

Full Service 24hrs all week.





HEALTH, ENVIRONMENT AND SAFETY

INTEGRATING CLIMATE RESILIENCE INTO PUBLIC HEALTH AND INDUSTRIAL SAFETY STRATEGIES

SUSTAINABILITY

We have embarked on a significant journey in developing a sustainability model that has led us to earn a Gold Medal from Ecovadis, one of the world's leading rating agencies in the sector. This journey is constantly evolving and developing.

The need for respect of health, environment and safety is a prerogative of ETS work with rigorous attention to the main international standards.

ETS engineering has undertaken a course aimed at the protection of health, safety and environment in all the processes encompassing the company: from the design phase to production and after sales activities.



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