

EcoEtruxure™  
Innovation At Every Level

# Machine



## Hoisting control solutions

Improve your hoisting and business performance

[se.com/hoisting](https://se.com/hoisting)

Life Is On

**Schneider**  
Electric

# What can Schneider Electric do for your hoisting control?



Reduce time-to-market ..... 6 – 9

- Overview of tested, validated, and documented architectures
- Reach maximum flexibility in control design
- Simplify programming and commissioning



Improve performance and safety ..... 10 – 13

- Take advantage of smart hoisting library
- Improve productivity by up to 25%
- Increase energy efficiency



Develop your business ..... 14 – 15

- Gain a competitive advantage by proposing service innovations

# We know your challenges ...

Your customers want cranes that meet increased demands for safety, efficiency, productivity, reliability, and energy efficiency — quickly, and at a reduced cost.

Your choice of control solutions is now, more than ever, a determining factor in distinguishing yourself at each stage of the entire process, right from design and development to implementation and maintenance of the crane.

## To meet your customers' demands for ...

- Shorter time-to-market
- Optimized performance
- Reduced maintenance
- Compliance with worldwide standards
- Global assistance

## ... Your cranes must have improved

- Safety
- Reliability
- Productivity
- Sustainability

# ... and we have the solution to meet them!

**Ecostruxure** Machine  
Innovation At Every Level

Ecostruxure Machine architecture helps you design more efficient and cost-effective cranes while maximizing their performance. Based upon flexible hardware platforms and a comprehensive single software suite, Ecostruxure Machine architecture provides tested, validated, and documented architectures with dedicated hoisting application function block libraries.





# Quickly build your automation solution

Integrated with Ecostruxure Machine Expert software suite, Ecostruxure Machine solutions provide a solid base of tested, validated, and documented architectures with dedicated application function blocks that can help you optimize cost, footprint, and performance and that are easy to implement in your applications.

## Tested, validated, and documented architectures for optimized results

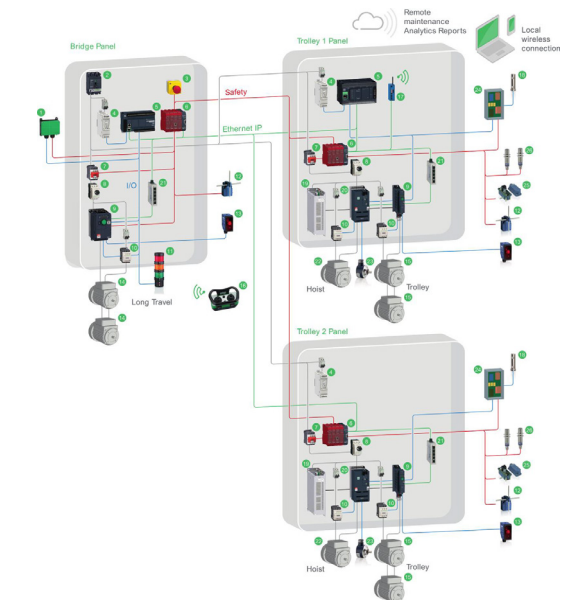
- **Tested:** proven functionality in any configuration
- **Validated:** full functional device compatibility
- **Documented:** user guides for easy installation and assembly, including CAD drawings

## Simplify the management of your customized solutions

Ecostruxure Machine solutions allow you to customize and upgrade your cranes without increasing design time or costs.

### Simple customization and integration

- With our function blocks you can simplify, modify, reuse, or customize
- With our FDT/DTP technology, it is easy to integrate your own systems into our architectures
- Integrated HMI using embedded, customized web server



### Compliance with global standards for maximum flexibility and durability

- Six programming languages (FBD, ST, SFC, LD, IL, CFC) and compliance with IEC® 61131-3
- Integrated open and standard device networks
- Remote connection through Wi-Fi and Bluetooth®

Reduce control system design and installation time by up to 50%





# How can you reduce your cranes' time-to-market?

Ecostruxure™ Machine architectures help you save up to 50% of your time

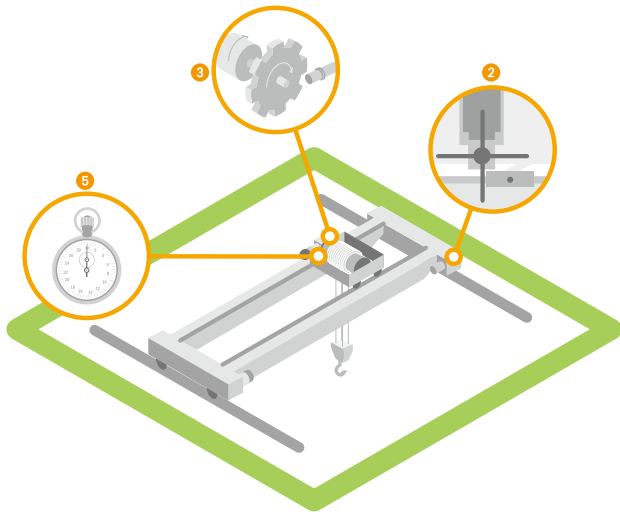


Reduce your cranes' time-to-market

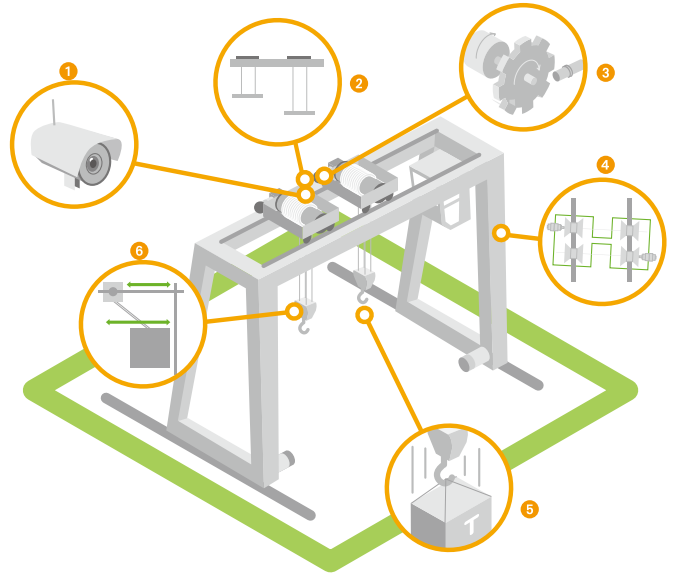
Discover a selection of reference architectures ...

Industrial cranes from simple up to automated and connected

Standard cranes < 10 T



Standard cranes > 10T or special cranes



Drive embedded functions

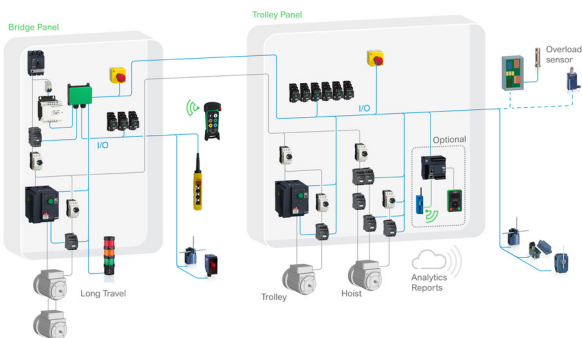
- 1 High speed hoisting
- 2 Limit switches management
- 3 Load over-speed control

Related functions

- 1 Monitoring data storage
- 2 Advanced position synchronization
- 3 Load over-speed control
- 4 Anti-crab
- 5 Overload control
- 6 Anti-sway (sensorless)

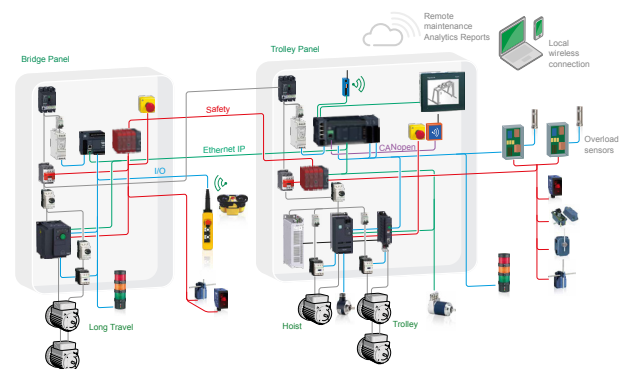
Simple hoisting

Compact/hardwired without logic controller



Performance hoisting

Distributed/Ethernet IP/logic controller/Modicon™ M241/M262



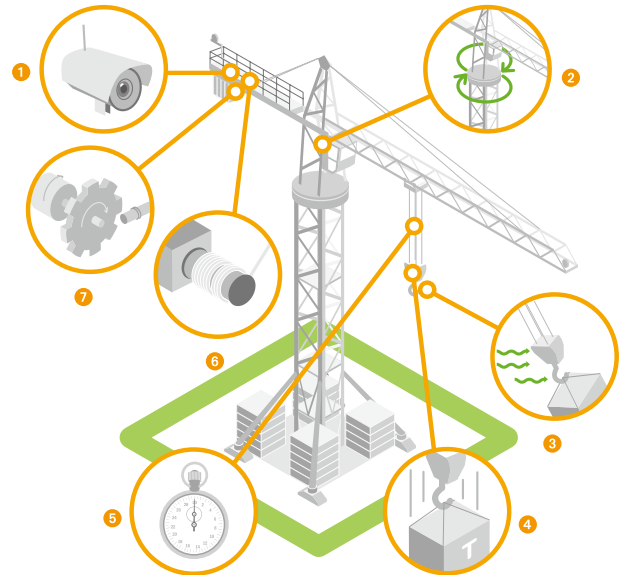
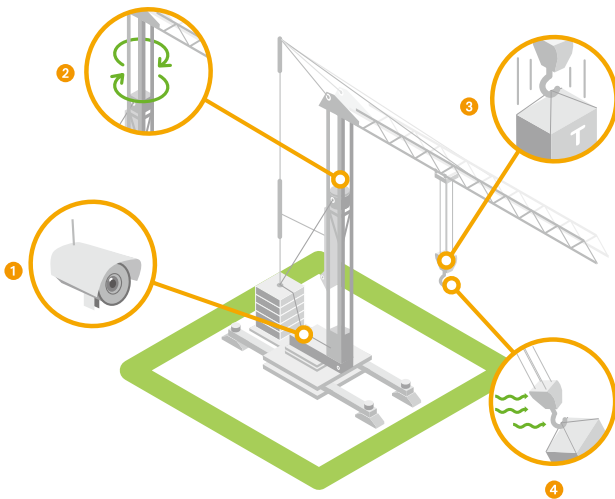
For other applications please contact our experts

... used in the most frequent hoisting applications

# Construction cranes

Self-erecting cranes < 2 T

Tower cranes > 2 T  
or special cranes



## Related functions

- 1 Monitoring data storage
- 2 Smooth slewing
- 3 Overload control
- 4 Wind-speed control

## Related functions

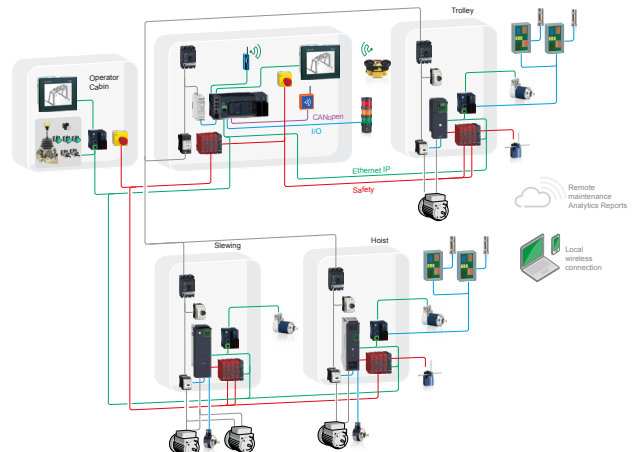
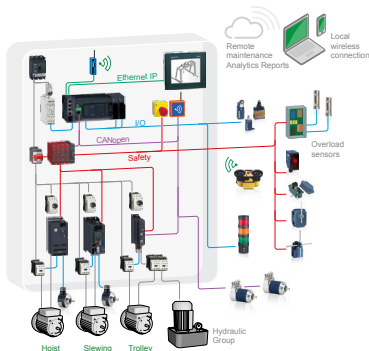
- 1 Monitoring data storage
- 2 Advanced slewing control
- 3 Wind speed control
- 4 Overload control
- 5 Speed optimization
- 6 Rope slack
- 7 Load over-speed control

## Optimized hoisting

Compact/hardwired or  
Ethernet IP/logic controller/Modicon M241/M262

## Performance hoisting (> 60 I/Os)

Distributed/Ethernet IP/logic controller/Modicon M241/M262



Consult our hoisting control solutions at [www.se.com/hoisting](http://www.se.com/hoisting)



Reduce your cranes' time-to-market

# Achieve maximum flexibility in control design

“Advanced Industrial Crane control” tested documented validated architecture and application program.

To reach optimized control of cranes and hoisting equipment, traditional relays and electronic boards are being replaced by controllers or PLC-based solutions. This has caused development costs to change and resulted in a greater emphasis on design efficiency.

Flexibility is key to providing a control solution that matches your requirements and allows you to reduce your costs. That's why Ecostruxure Machine solutions incorporate a flexible machine control platform that embeds intelligence in its products and provides a unique software platform with a single, easy-to-use environment for developing, programming, and commissioning your cranes.

## 1 software environment

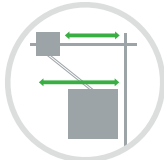
**Simplify machine programming and commissioning** with the Ecostruxure Machine Expert software suite.



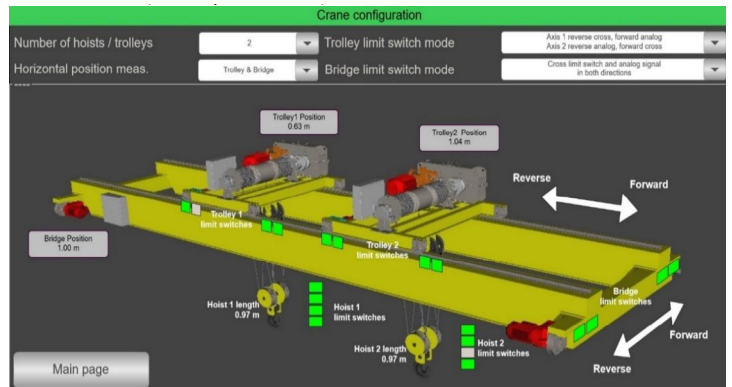
Ecostruxure Machine Expert



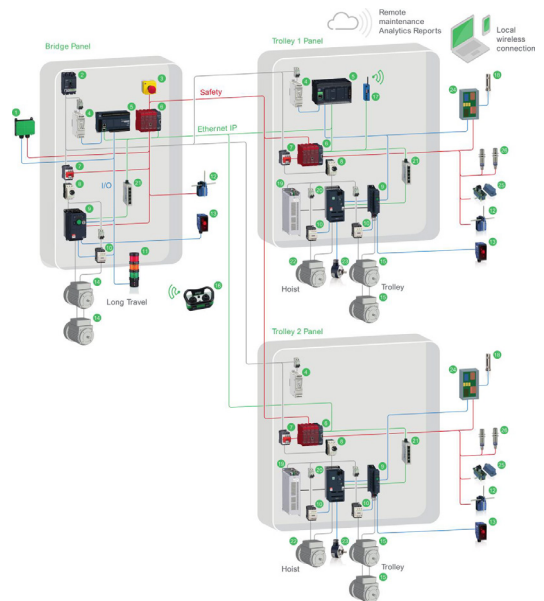
hoisting



application function block



## Web Visualization



## Multiple hardware control platforms

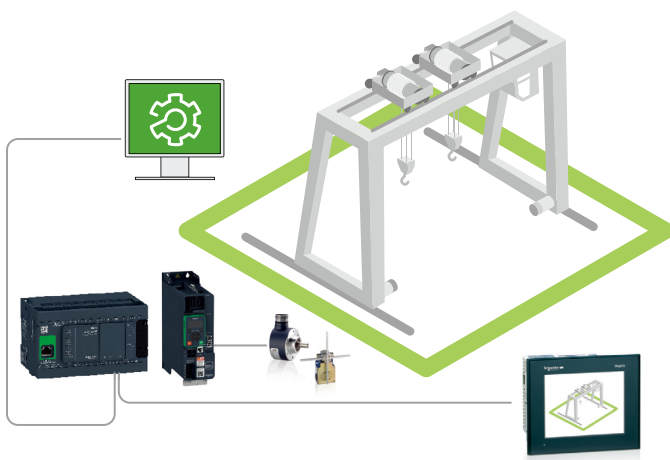
**Embedded intelligence** where it is needed.



**Achieve** maximum flexibility and optimization of your cranes

# Simplify programming and commissioning

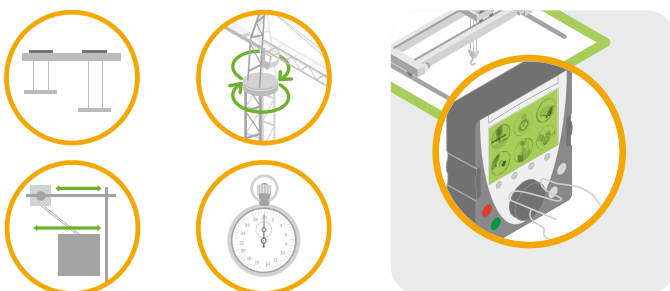
The Ecostruxure Machine Expert software suite is developed specifically for OEMs and allows you to design, commission, and service your cranes in a single environment. It helps you get to market faster and adds a competitive advantage to your cranes.



## A single software suite for your complete control system

Ecostruxure Machine Expert makes it possible to program and commission

- Controllers
- Human Machine Interfaces (HMI)
- Drive and motion control
- Implementation of your networks
- Application libraries
- Tested, Validated, and Documented Architectures



## Reduce effort and complexity of program design and implementation times

Speed up your task through the use of our extensive range of hoisting application function blocks (AFBs) library, application template, and integrated expert functions.

**Application Function Blocks (AFBs) examples:**  
Our pre-programmed AFBs help speed up tasks. They are easy to implement in the machine programs, thus reducing effort and risk of errors.

**Application template:**  
Control the whole application with key embedded application functions and save up to 90% in programming!  
This predefined program structure is dedicated to a machine type. It can be easily adapted to your own machine by performing the appropriate configuration.

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1 software environment, 1 project file, 1 connection, 1 download





# How can you improve the performance and safety of your cranes?

Ecostruxure Machine solutions enhance safety and help you improve productivity by up to 25%



# Turn safety into a business asset

Safety is a serious obligation and laws require hoisting equipment to be safe. Not only do accidents harm people, they can be very costly as well.

As automation as well as safety experts, Schneider Electric™ defines solutions by combining security and performance to help you make safety an asset in your business.

## Comply with safety standards

Scalable safety solutions are proposed depending of the requested safety level.

- Standard machines usually request ISO 61849-1 “Plc Cat 2” safety level. We have a Sistema library to make the safety calculation using our drives:
  - ATVXXX – control by digital input with brake feedback monitoring
  - ATVXXX – control by fieldbus with brake feedback monitoring
  - ATVXXX – Overspeed monitoring
- Special machines usually request ISO61849-1 “Plc Cat 3” or IEC62061 “SIL2” safety level. By adding XPSMCM safety controller as an example, we can propose many safety functions from performance Level (PLd to e), safety integrity level (SIL 2 or 3).

## Sistema library

Download the Schneider Electric library for Sistema:

[https://www.se.com/ww/en/download/document/Reliability\\_values/](https://www.se.com/ww/en/download/document/Reliability_values/)

## Early detection for enhanced safety and longer crane life through dedicated functions

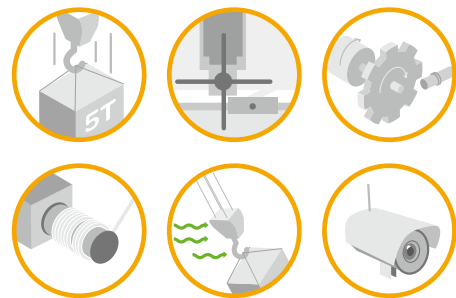
- Over-loading with overload control EN15011
- Over-travelling with limit switch management
- Load-slipping with load over-speed control
- Over-lapping with speed optimization and rope slack control
- Wind speed control to prevent risks caused by strong winds

## Improve preventive maintenance

- Acquire and record warnings with the monitoring data storage function
- Monitor usage of machine according to ISO or FEM category (Hoisting Duty Cycle)

## Effectively manage risks

- Avoid dangerous load sway and reduce operator stress/fatigue with anti-sway control functions



Application function blocks

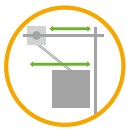
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Increase the safety and performance of your hoisting applications, all while reducing cost and complexity

# Take advantage of Smart Hoisting Library

Combine your know-how with our innovative automation solutions and increase the productivity of your cranes and hoisting equipment!

## Improve accuracy and speed with dedicated application function blocks



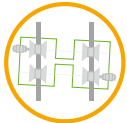
### Sway management

- Improve load positioning accuracy and efficiency by preventing load sway with the anti-sway open loop function (sensorless or closed loop function).



### Speed optimization

- Reduce production time on hoisting operations through constant motor power with the speed optimization and rope slack functions.



### Highly accurate alignment

- Reduce the friction between the bogie and the rail independent of load with a position accuracy of +/- 5 mm thanks to the anti-crab function.



### Fluid movement

- Achieve smooth and accurate movement on slewing cranes and position loads precisely on target with the smooth slewing function.



### Advanced tandem function

- Use two cranes in tandem mode with self-positioning correction.

## Achieve perfect load control

- Altivar™ heavy-duty drives are designed specifically for hoisting applications.
- Up to 220% over-torque capacity.
- Flux vector control with or without sensor for asynchronous and synchronous motors.
- Speed or torque control.
- Brake control for travelling, hoisting, and slewing motion.
- Speed monitoring and load wear detection in closed loop.



ATV340



ATV320

Benefit from the latest technological developments



Dedicated hoisting function blocks and drive technology help you enhance productivity

# Increase energy efficiency

Energy efficiency is of growing concern for your customers. By offering them hoisting equipment that can save energy, you will differentiate yourself in the market and gain a competitive advantage. As a global specialist in energy management, Schneider Electric has already developed a broad portfolio of proven solutions for improved energy efficiency.

## Energy optimization compliant with ISO50001 in four sustainable steps

**1 Measure** energy use with expert auditing to identify potential savings on the crane.

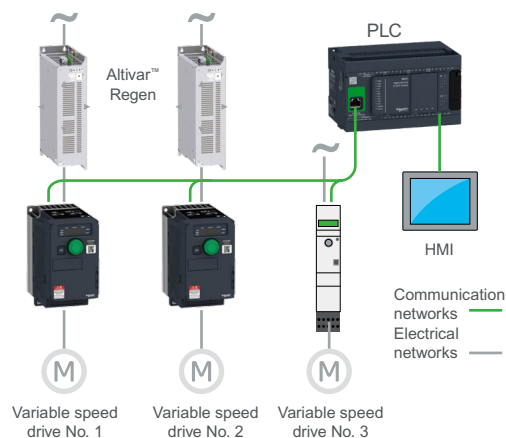
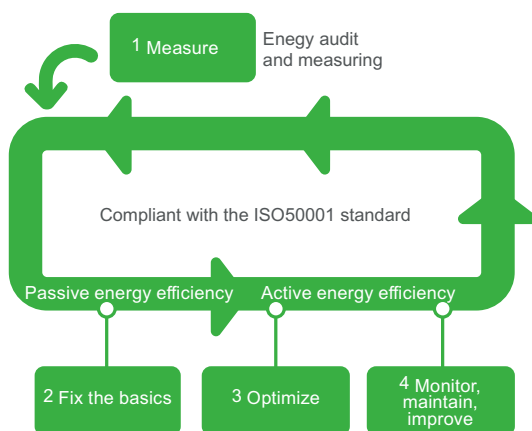
**2 Fix the basics:** Reduce energy consumption by choosing the right motors and variable speed drives, and by using a thermal solution for enclosures.

**3 Optimize** your crane's power consumption with energy operation modes or application function blocks designed for energy.

**4 Monitor:** Track relevant information with power meters and correlate energy consumption with crane production data using a machine energy dashboard.

## Regenerative solutions improve energy efficiency

- Variable speed drives with regenerative feedback cut energy requirements considerably in hoisting applications where loads have to be frequently decelerated.
- When adding an an ATV Regen to a standard drive, for example when lowering a load, the arising energy is returned to the mains.
- This provides 4-quadrant operation and thus is well-suited for applications with a generator-operating mode.
- On top of energy efficiency, resistor-less technology is very robust in harsh environments and minimizes the risk of short circuits generated by dust in braking resistors.



Regenerative solutions can reduce energy consumption by up to 60%





How can you develop  
your business?

Ecostruxure Machine keeps you one step ahead



# Gain a competitive advantage by proposing service innovations

## Develop new Business Model/Service Innovations

- Built-in intelligence (ability to interpret detailed asset data)
- Implement preventive maintenance
- Service concepts based on the real usage (Time of use and the number of operations)
- Provides dashboards, notifications (Track and predict any anomalies)

### IloT Machine Essential



**Harmony – IloT Box**



**Secure Connect Advisor**



**Machine Advisor**

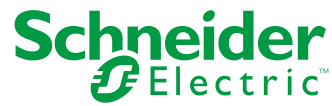
### Remote Connectivity and Monitoring

- Machines with remote maintenance and cloud connectivity
- Condition based decision making
- Scheduled or predictive maintenance

### IloT Machine overview

- Discover IloT Digital Services for crane and hoist applications
- Digital technical support for maintenance and after sales support
- Predictive Maintenance Enabler (Identify issues before failure)
- Reduce diagnosis, corrective action time (Shorter repair windows minimize time)
- Reduce Downtime (Early flagging of potential problems)
- Monitor device health, alert customers (Detect when equipment needs service)

Life Is On



Make the most of your energy™

[se.com/hoisting](https://se.com/hoisting)

Schneider Electric Industries SAS  
35, rue Joseph Monier - CS 30323  
F92506 Rueil-Malmaison Cedex