

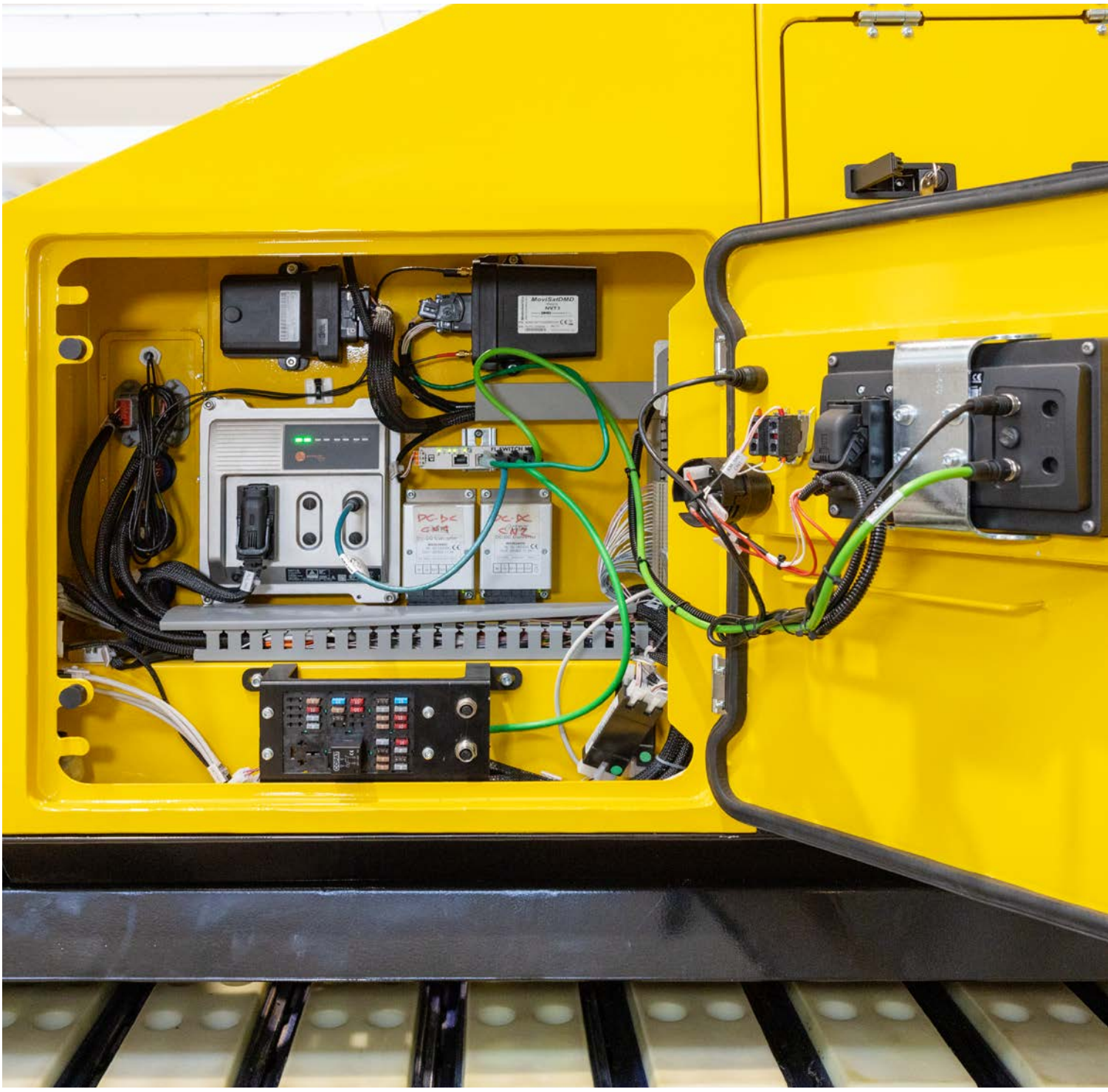
# ELECTRIC CRANES: PERFORMANCE, PRECISION AND SAFETY

## JMG Cranes uses ifm solutions for mobile machines to minimise risks and ensure maximum ease of use.

JMG Cranes is an Italian company specialising in the development and manufacture of battery-powered electric cranes. Since its founding in 2007, JMG has been developing compact lifting solutions that, depending on the model, can handle loads ranging from 900 kilograms to 70 tonnes and position them with millimetre precision. The cranes are specially designed for use in confined or hard-to-reach work areas and are typically operated by radio remote control.

**Prevent tipping, simplify operation**

The combination of high load-bearing capacity and compact design places particularly high demands on safety and control system. When lifting heavy loads, load moments, outreach and lifting heights must be continuously calculated in real time. Critical situations that could, for example, cause the crane to tip over must be detected at an early stage and dealt with automatically.



A look inside: the crane's "brain", the CR710S controller.




The display shows the current operating status in real time: the crane's speed, the load being lifted and the boom angle.



Compact dimensions, yet exceptional performance: ifm's automation technology ensures safe operation.

At the same time, JMG follows a clear and intuitive operating concept: Regardless of the model, the control system remains consistent, allowing operators to work safely without having to adapt their procedures when switching from smaller to larger cranes. This improves ease of use and reduces the risk of operating errors.

## ifm's controllers as the 'brain' of the machine

**Luca Scotti,** software developer at JMG Cranes, explains: *"The primary safety system is a load moment limiter that uses sensors to determine the maximum permissible operating ranges and boom heights based on the current load. This enables the machine to restrict its own movement as soon as the boom approaches a critical zone that could, for example, cause the crane to tip over."*

The technical basis is provided by the CR710S controller from ifm, which is designed for use in mobile machines. It performs safety-critical functions such as limiting load moment and load, while continuously processing data from numerous sensors, including the PT9551 pressure sensor, which monitors the condition of the stabilisers on crane vehicles fitted with outriggers.

The safety of the cranes is deliberately designed to be software-based. *"One argument in favour of using the ifm controller is the existing certifications,"* adds **Luca Scotti**. Hardware and software have been certified by the German TÜV association. In the event of serious faults that could cause the crane to tip over, the controller, for example, puts it into a safety mode and switches it off automatically, thereby providing an additional security level.

A distinctive feature of the ifm controller is the integration of both a safety PLC and a standard PLC in a single unit. The safety PLC performs the complex and safety-critical calculations, while the standard PLC controls the rest of the machine's logic. Luca Scotti emphasises that this high-performance architecture is necessary because the load moment limiter requires a large number of dynamic and trigonometric calculations.

**Luca Braghieri**, Managing Director at JMG Cranes, sums up the importance of the controller with an apt image: *"The controller is the heart of the machine or, rather, its brain, because this is where all safety-related information is collected and processed. It is precisely this interplay between computing power, sensors and software that forms the basis for the high level of active safety offered by the cranes."*

## Continuous condition monitoring for safe operation

In addition to load limiting, the controller monitors numerous operating parameters such as temperature, pressure, movements and the condition of motors and the battery. This comprehensive condition monitoring is crucial to ensuring the long-term performance, efficiency and service life of the components.

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>
> *Luca Braghieri, Managing Director at JMG Cranes*

**Display technology and automation in operation**

The ecomatDisplay from ifm is the crane's central human-machine interface and compact control unit: *"During operation, the focus is on the operator, and the crane controller is designed to be intuitive and functional. By tailoring the display to the user and creating bespoke graphics, we can make operation easier,"* explains **Niccolò Fontana**, industrial designer at JMG. Depending on the size of the machine, displays with a screen diagonal of five or seven inches are used. Thanks to high-speed Ethernet communication, extensive safety and process data can also be displayed clearly and continuously.

The system is complemented by robust I/O modules designed for mobile use. In the JMG application, they play an important role in the decentralisation of the machine architecture: they receive signals from sensors and actuators and communicate with the controller via the CAN bus.

The sensor data can be pre-processed directly within the module, reducing the amount of data transmitted and easing the load on the controller. In addition, signals from various parts of the crane – for example, from the control cabinet, the hydraulics or the pump unit – can be detected and processed in a more targeted manner. This improves diagnostic capabilities, as faults can be located more accurately. In mobile machines with decentralised components, this results in simpler maintenance, a clearer system architecture and, ultimately, higher availability.

# CONCLUSION

Thanks to the consistent use of automation technology, sensors and high-performance controllers from ifm, JMG Cranes combines mechanical precision with intelligent software. The controller acts as the machine's central 'brain' by constantly analysing loads, movements and operating conditions, and actively protecting the crane. At the same time, a standardised, user-friendly HMI approach ensures that safety is not sacrificed for the sake of simplicity. The result is a range of electric cranes that operate with precision and, above all, exceptional safety, even under the most challenging conditions.

**ifm.com/cnt/jmg-cranes**

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