



TEC CONTAINER: SETTING THE COURSE FOR SHORE POWER

Mobile cable management systems deliver shore power safely and efficiently to ships – using automation technology from ifm.

While docked, ships often keep their auxiliary engines running to power onboard electrical and auxiliary systems. In densely populated port and coastal areas in particular, this means constant emissions and noise, along with additional operating costs. The solution is shore power: electricity supplied directly from the port grid to the ship, allowing the auxiliary engines to be switched off.

Transferring shore power safely to the ship requires high-performance cable management systems. The company TEC Container specialises in this field and develops mobile solutions for use in ports around the world.

From lifting specialist to innovative port solutions provider

Based in Madrid, TEC Container has been in business for more than 50 years. Since its foundation in 1976, the company has developed and manufactured lifting equipment for customers in the port logistics and wind energy sectors in more than 115 countries.

“Around five years ago, we expanded beyond our traditional lifting business and established a new business area: cable management systems. These solutions enable power to be transferred safely from the port grid to the ship,” explains Javier Pérez, Sales Director at TEC Container.



“In addition to the quality of the components, we particularly value the technical support provided by ifm. We were supported throughout the process, from system architecture design through to implementation. For us, ifm is much more than a component supplier. They are a technology partner.”

Javier Pérez, Sales Director at TEC Container

The systems consist of a mobile unit with an integrated cable reel. The mobile platforms can travel along the quayside either manually or using an automated guidance system, paying out the power cable as required. As technical requirements vary from port to port, the systems are generally tailored to the specific conditions at each location.

Working around salt water, heavy-duty cables and large ships

The application places high demands on the equipment: Heavy power cables have to be moved in the immediate vicinity of ships and water. *“As this is a mobile platform that moves along the quayside while people are working nearby, it needs to operate with absolute safety. The electrical connection also needs to be secure to prevent any incidents during connection and disconnection,”* emphasises **Alejandro Caballero**, Electrical Engineer at TEC Container.

At the same time, the technology has to withstand high humidity, salt-laden air, temperature fluctuations and constant vibration.

ifm automation solution at the heart of the system

The scale is immense: while an everyday power cable can simply be plugged in by hand, this application involves power cables as thick as an arm and large, heavy connectors.

Alejandro Caballero explains the procedure: *“The self-propelled mobile platform travels along the quayside to the ship, laying the cable on the quay as it goes. Once the machine is positioned near the ship’s access point, a telescopic arm guides the cable to the ship, where it is connected. This allows the ship to switch off its auxiliary engines, reducing emissions and noise in coastal towns.”*

To ensure that everything runs smoothly, the company relies on products from the automation specialist ifm: At the heart of the mobile cable management unit are several high-performance ifm controllers. The programmable controllers CR0403 and CR0709 coordinate all of the machine’s movements – from travel and telescopic arm operation to cable guidance. They process signals from the various sensors in real time and ensure that all subsystems work together precisely and reliably.



Controllers and safety relays from ifm ensure reliable operation.

I/O modules collect data locally and connect sensors and actuators to the machine control system.



A G1501S safety relay is used to ensure functional safety. It monitors the connected sensors and ensures that safety-related functions are performed reliably at all times. ifm's DN4234 power supply provides a stable voltage supply to all components. Acting as a decentralised interface between sensors, actuators and the controller, the CR2042 I/O module consolidates the input and output signals and transmits them to the controllers via a CAN bus.

"Using fieldbus-based and distributed systems has significantly reduced production and wiring effort. Compared with conventional wiring, we need far fewer cables and can significantly reduce the risk of wiring errors," notes **Javier Pérez**.

Various ifm sensors provide the process data required for safe operation. The absolute multiturn encoder RM9000 detects the steering angle of the wheels. The RM900S safety encoder continuously monitors the position of the cable reel and helps prevent incorrect movements or overloading of the cable system. The PT54 pressure sensor continuously measures the hydraulic pressure and provides the basis for controlled and smooth movements of the hydraulic functions. The LT3022 level sensor monitors the level of key operating fluids, such as coolant, allowing critical operating conditions to be detected at an early stage.



Finally, the CR1204 graphic display serves as the central interface between operator and machine. The intuitive user interface allows the operator to control all functions of the cable management unit, monitor relevant operating data in real time and quickly evaluate diagnostic information and error messages.

Alejandro Caballero explains what matters most: *"The machine needs to be easy and intuitive to operate, so that operators and maintenance teams have quick and easy access to all the information they need about the machine's status and can easily identify any potential faults."*

The seamless interaction of all components results in a reliable, easy-to-maintain automation solution designed to withstand the demanding conditions of the maritime environment.

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The telescopic arm guides the power cables safely to the ship.

CONCLUSION

With its cable management systems, TEC Container provides the infrastructure needed to supply ships with shore power in port. The mobile units reliably connect the port and ship electrical systems and help significantly reduce emissions and noise while vessels are berthed. ifm's automation solutions form the technological backbone of the system. They ensure precise movements, intuitive operation and reliable performance, even under the demanding conditions of maritime environments.

