

TMACS CARGO

Team Maritime Alarm & Control System Cargo



TMACS Cargo

In order to maintain safe and efficient handling of a vessel's cargo, it is crucial to have a reliable cargo monitoring system where it is easy to get a clear overview of all the cargo tanks. Therefore we have developed a modern cargo tank monitoring system, **TMACS Cargo**. The system is very scalable, and can be adapted to almost any vessel. With remote gateway installed, most troubleshooting, software updates and radar adjustments can be done without the attendance of a service engineer. We in Team Maritime are experts on refit and retrofit.

Scalability

TMACS Cargo can be delivered with two different solutions for HMI. For smaller systems, a web server is the most reasonable option, while for larger systems with demands for trend history, SCADA is the recommended solution. SCADA communicates with the PLC through the OPC UA protocol and can store trend data up to a year back in time (Longer periods can be stored upon request). The mimic pictures are tailor made to suit customer's preference regardless of chosen solution. **TMACS Cargo** can be delivered with controller redundancy, or as a standalone controller system, depending on the application of the system.



Key benefits

- **Competitive** Pricing
- **Secure** remote connection for support and updates
- **Zero** system **downtime** with redundant controllers
- Fully **integrated** with TMACS Engine and PMS.
- **Easy** installation and **easy** to use
- Class **Certified** Products (e.g. DNV GL)
- **Availability** and **competitive** pricing of spare parts
- **Safe** and **simple** back-up / restore
- System fully **functional** during updates

Functionality

- Cargo tank gauging (radar)
- Pressure measurement
- Temperature measurement
- Cargo line/manifold pressure measurement
- Ballast tank level measurement
- Service tank level measurement
- Draft, trim/list indication
- Valve control, standby pumps, PID-controllers etc.
- Remote operation of valves and pumps.
- Integration with Loading Calculator

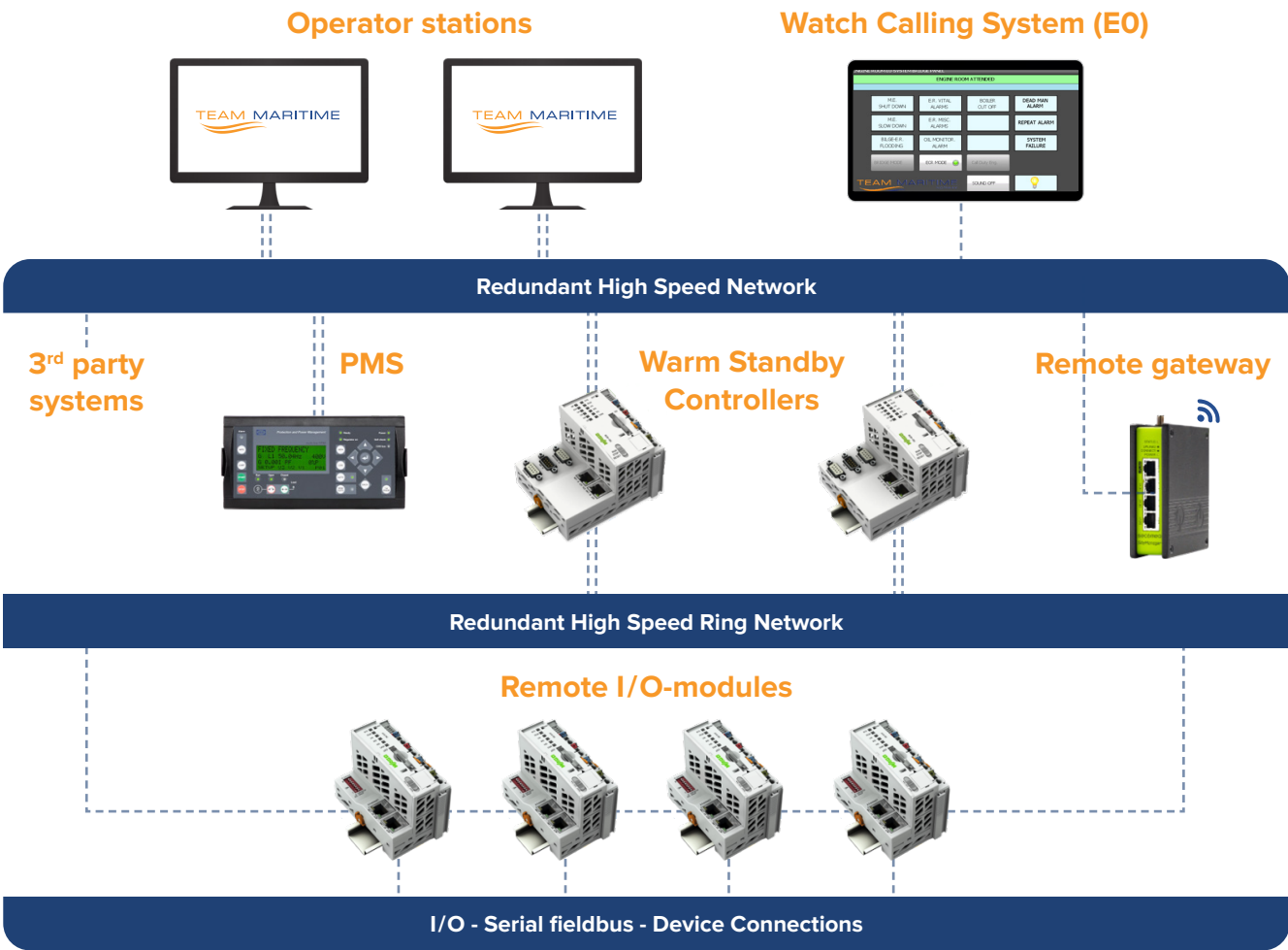


Topology – Redundant Control Topology

TMACS Cargo is a modern and highly flexible alarm and control system for your vessel. Based on our TMACS 1000 platform. The **TMACS Cargo** system uses operator stations, controllers and remote I/O units (RIO). The controllers process all data, while RIOs are used for distributed inputs and outputs. The equipment can be placed all over the vessel to reduce cabling. In addition to this, it is possible to operate the system from multiple locations. The operator stations and the controllers are redundant to minimize the downtime of the system. Most software updates can be done on the controllers without affecting any running processes. Our controllers support a wide range of industrial protocols including ASAP, Modbus TCP, CAN bus and OPC UA. **TMACS Cargo** is always delivered with remote connection for service and support.

Following is an example of a redundant system:

- One pair of redundant warm standby controllers with double network connection.
 - Both controllers run simultaneously, where one is master and the other is standby.
 - The master controllers detects errors on the standby controller and the RIOs. It also runs network diagnostics to the operator stations.
 - I/O data and control functions such as state of pumps are continuously synchronized to standby controller.
 - “Bumpless Changeover” on RIOs. The RIO units are not affected if a master controller fails.
- The standby controller immediately takes over the control of the RIOs. The system is therefore unaffected by a master controller failure, but the operator will be alarmed of the event.



Warm Standby Controllers

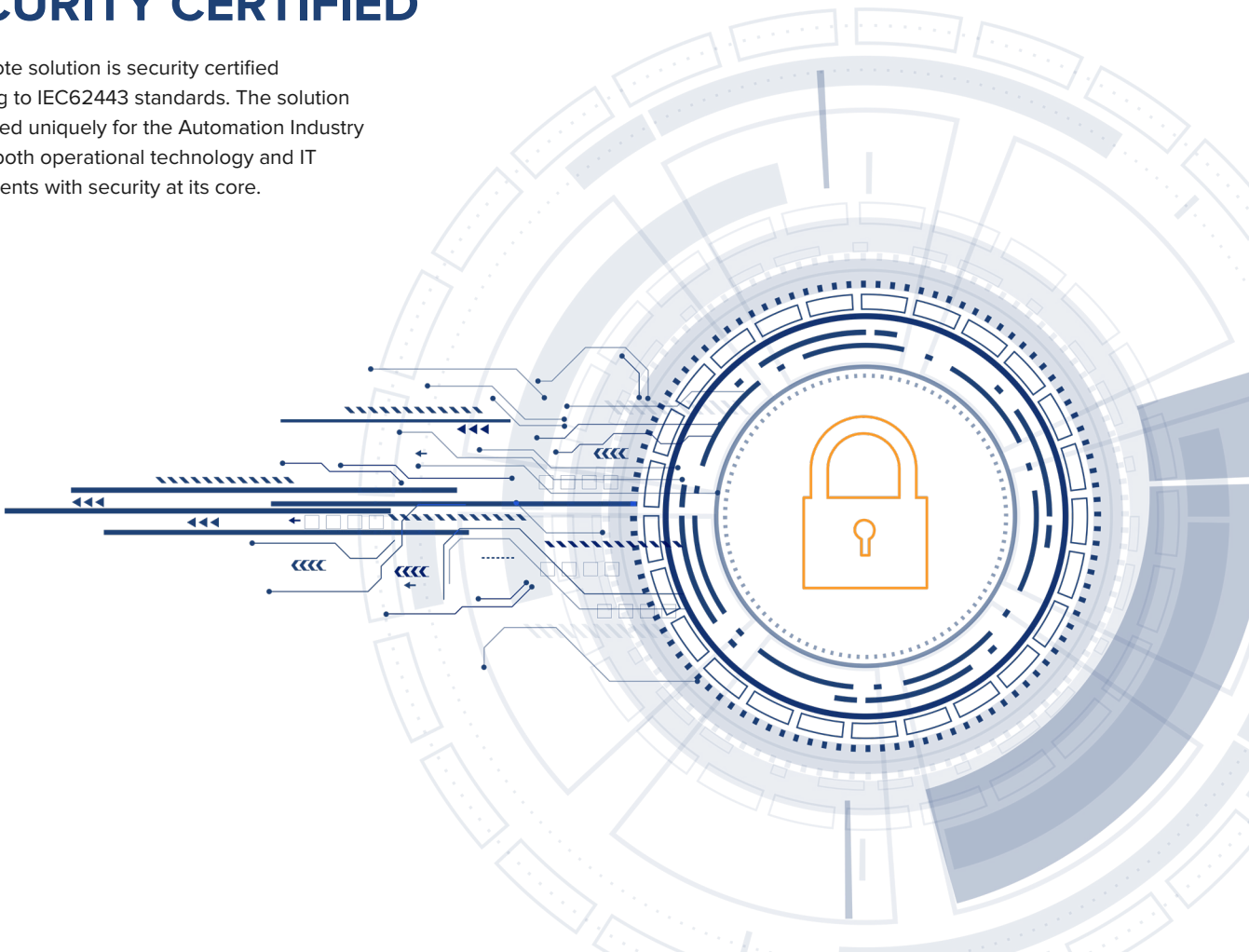
With the redundant option, **TMACS Cargo** is equipped with a minimum of two redundant master/standby controllers. These controllers are identical, and contains the exact same software and configuration. A modern synchronizing routine makes sure that the standby controller receives all data necessary such that if an unforeseen event occurs (Such as a power failure on the master controller), the standby controller will automatically take control of the processes and continue with the exact same data as the master had before the failure. This makes sure that all ongoing processes on the vessel and communication to third party equipment such as engines and frequency drives is maintained. The controllers are of high maritime standard with a high processing capacity to ensure safe operation of the system.

Secure remote maintenance and Software update

We always include remote access opportunity as a part of our delivery. This can be used for support, updates, assistance, maintenance or analysis and reduces service and travel costs. The connection is established through a VPN tunnel to a highly secure gateway on site. The unit can block any incoming connections with a simple key switch.

SECURITY CERTIFIED

Our remote solution is security certified according to IEC62443 standards. The solution is designed uniquely for the Automation Industry to meet both operational technology and IT requirements with security at its core.





About Team Maritime

Team Maritime was founded in August 2005 by former Autronica/Kongsberg employees. We're an independent actor in the market and able to serve shipowners, shipbuilders, shipyards and fish farmers at a competitive price.

We have attended more than 1000 vessels world wide since the foundation.

Team Maritime is 100% owned by our employees, resulting in motivated engineers attending your vessels.

We're specialized in system integration and deliver complete advanced system solutions with modern technology for marine and aquaculture but also for other industrial industries upon request. Our systems is designed and built with focus on safety and reliability.

We have highly experienced engineers ready to serve you for:

- Service
- Engineering
- Commissioning
- Surveys
- Remote support / Troubleshooting

In addition to our systems, we're specialized in:

- Spare parts (both new and reconditioned)
- Obsolete parts
- Refit / Retrofit
- In house repairs

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