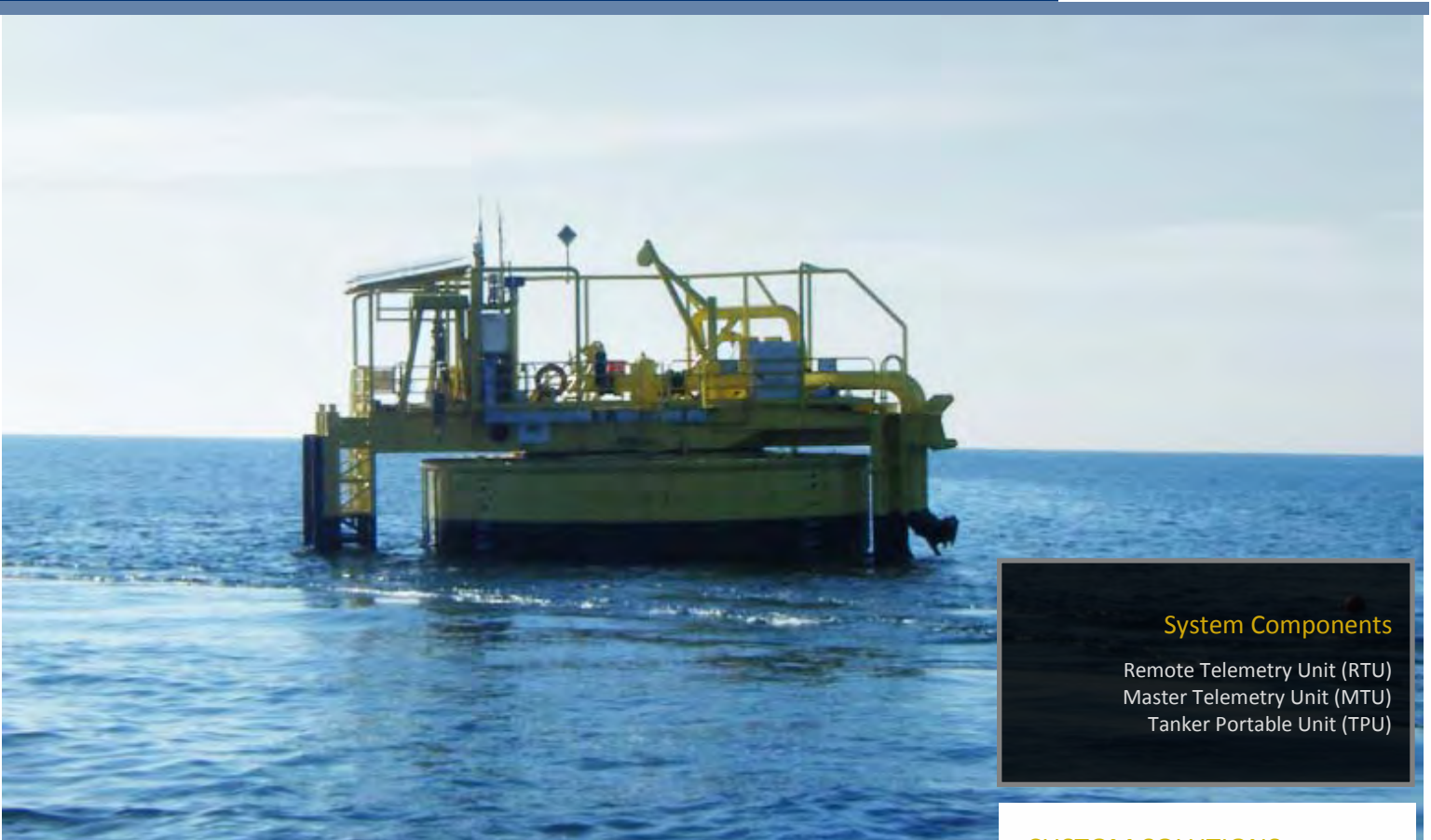


Telemetry for CALM Buoys

Including NavAids, Load Cells, Pressure Transducers and Met-Hydro equipment



System Components

Remote Telemetry Unit (RTU)
Master Telemetry Unit (MTU)
Tanker Portable Unit (TPU)

Providing complete Telemetry + NavAid solutions

The RTU is mounted on a Catenary Anchor Leg Mooring (CALM) buoy which is a system used for offloading of crude oil from a permanently moored Floating Production Storage and Offloading (FPSO) unit. The CALM buoy has a number of sensors such as load pins measuring the hawser loads, weather sensing equipment, fog detection and product line pressure evaluation, as well as navigation aids mounted on it; all generating data that must be transmitted to a monitoring station on the FPSO or to a shore base. The Tanker Portable Unit (or TPU) is used by the loading master supervising the transfer of oil to view the system status from on board the tanker.



CUSTOM SOLUTIONS

Remote Terminal Unit

Pharos Marine has used Rockwell's Allen Bradley series of PLCs in the remote telemetry unit on the CALM buoy to acquire and process this raw data and map it wirelessly, using the DF1 protocol, via UHF radio modems to the MTU and TPU for display on Rockwell's Factory Talk View Station SCADA screens.

Important parameters updated every few seconds with system critical information boasting sub-second responses in ideal conditions and not exceeding two seconds. Less consequential data is updated less frequently or polled, improving the efficiency of the comms.

Master Telemetry Unit (Monitoring Station)

HMI Screenshots display live information received over UHF.

The screenshots below show low battery indications, the alarm screen, status of the aids to navigation and trends for battery, load and pressure.



Master Telemetry Unit

The MTU is typically presented in a 19" rack fitted with a highly spec'd industrial PC, printer, a programmable logic controller, a set of high performance radio modems and supplementary electronic circuitry. It includes all the control, alarming, trending and datalogging features. All designs are tailored to customer specifications.

Complete Solution

The complete system has been tailored in all aspects to suit the application and boasts fast communications, complete systems monitoring including alarming features and logging with a pleasant, concise and easy to use interface.



Tanker Portable Unit

Portable monitoring on board + functional repeater

The TPU user has minimal control over the RTU and MTU and its main purpose is to relay information. The TPU itself consists of an industrial laptop running Rockwell's Factory Talk Station, an Allen Bradley PLC, a set of radio modems, a power supply and supplementary electronics in a portable case. It provides a means of monitoring on board the offloading vessel and functions as a radio repeater in case of radio communication disruptions caused by the presence of the offloading vessel.





Technical Specifications

- Operating Voltage:** 12V / 24V depending on system requirements. The solar system is sized to provide the autonomy required. Premium quality maintenance free lead acid batteries are used as standard along with a technically advanced solar system controller to manage the charging process and maximize battery life.
- NavAids:** With over 100 years of experience in the Navigation Aids industry, Pharos Marine Ltd. is ideally placed to fulfill any requirements for marine Lanterns, fog signal stacks, fog detectors and radar beacons for both safe and hazardous areas.
- Enclosures:** All RTU enclosure equipment (including battery boxes) are supplied in certified, explosion proof enclosures suitable for use in hazardous areas by a specialist manufacturer of hazardous area equipment for the oil, gas, petrochemical, pharmaceutical and marine industries worldwide.
- Controllers:** All the controllers are designed and built based on individual requirements. We work closely with our customer's engineers to ensure the specifications are met.
- Radio Modems:** We use highly reliable and secure radio modems from Elpro Technologies to ensure a high availability of comms for monitoring load and product pressure data during offloading. Elpro are a world leader in the design and manufacture of industrial wireless solutions.
- Load Pins:** Strainstall UK have 40 years of cross-industry experience in all areas of load measurement and in the manufacture of both standard and specialized load cells and their standards are the most advanced in their industry.
- Oil Pressure Transducers:** We use the unmatched Rosemount series of Pressure Transmitters from Emerson Process who have over 50 years of expertise behind them and include the broadest offering to suit any application.

System Integration

Pharos Marine integrates market leading equipment from manufacturers that are specialists in their respective fields. Shown below are our hand-picked suppliers but we can tailor solutions to meet your needs. We are happy to source from your preferred supplier or have items free issued to us.

Navigation Aids:
Pharos Marine Ltd.
Automatic Power Inc.

Programmable Controllers:
Allen Bradley PLC
(Rockwell Automation)

Radio Modems:
Elpro Technologies
(Cooper Bussmann)

Pressure Transducers:
Rosemount Pressure Products
(Emmerson Process Management)

Load Cells:
Strainstall UK Ltd.





Pharos Marine Ltd.

Navigation Aids for over 100 years

Named after the famous lighthouse that stood on the Isle of Pharos in Alexandria, Egypt, Pharos Marine began making aids to navigation more than 100 years ago. The company's founder, Gustav Dalen, had a distinguished career, winning a Nobel Prize when he introduced a system of acetylene gas lights capable of operating for a year without service. Pharos Marine has provided products for some of the most famous navigation projects around the world, including the first buoys for the Panama Canal. Now partnered with Automatic Power, Pharos Marine operates worldwide from offices in London, Stockholm and Singapore.

Service Options

Pharos Marine offer optional services to support all our systems.

These include:

- Start up and commissioning services
- Additional requirements for documentation (own logo on documents, specific drawing type that are not part of our standard package etc)
- Training for you or your customers on the functionality and use of our systems.



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