



# Marinestar® Manoeuvring System



The Marinestar® Manoeuvring System can assist in improving fuel efficiency by monitoring fore and aft trim dynamically whilst the ship is at sea and also by providing a high accuracy heading reference source.

## Dynamic Trim Measurement

### Keep Trim

Trim management has been identified as a key area for reducing operating costs, giving significant bunker fuel savings.

In addition to providing operating cost advantages, reducing bunker fuel consumption is better for the environment.

Marinestar® is able to measure trim accurately and smoothly throughout the voyage. The graphical display is continuously updated with the latest trim, which is shown alongside speed for comparison. An optimum trim level can be displayed as a target for efficient running.

### Using GNSS to Measure Trim

The high-tech Marinestar® GNSS equipment measures position vertically as well as horizontally. Taking vertical position measurements from antennas located fore and aft, the Marinestar computer is able to calculate trim on a continuous, real-time basis.

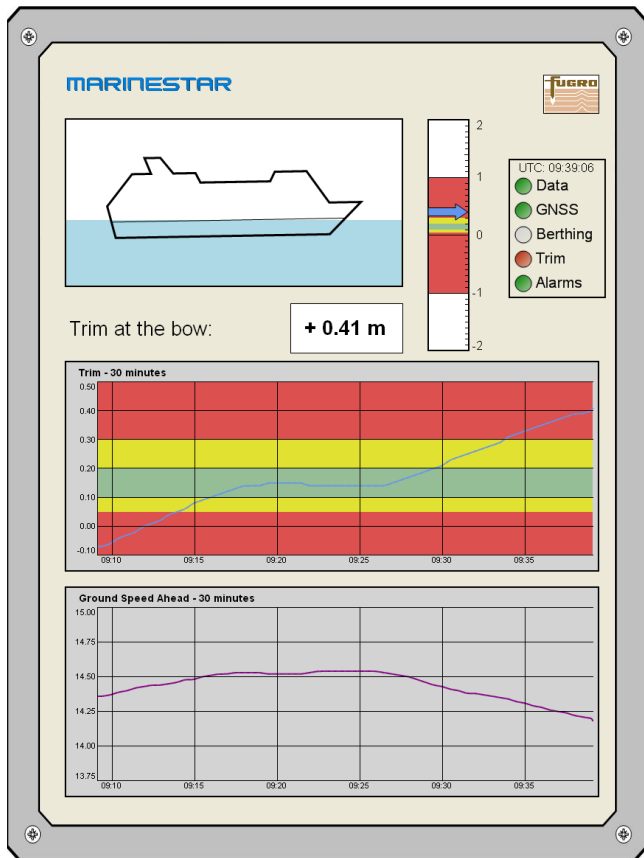
Sophisticated data processing techniques eliminate the effect of weather and sea conditions, to give a clear picture of trim throughout the voyage.

With a vertical accuracy of just a few centimetres, Marinestar® is an ideal tool for effective trim optimisation.



**MARINESTAR®**

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Optimum trim can be overlaid on the graph as a simple target for efficient running.

Optimum trim data can be entered into the software if available, or taken as an input from another compatible system.

## Optimum Trim Study

Fugro has a collaboration agreement with DNV to deliver systems and services for trim optimisation. Under this collaboration DNV provides technical advisory services to calculate optimum vessel trim for a range of vessel speeds and loading conditions.

The marinestar® MS measures the actual 'dynamic' trim, whilst the vessel is at sea, and compares this against the DNV calculated optimum trim to assist ship officers in achieving maximum fuel efficiency.

*Specifications subject to change without further notice*

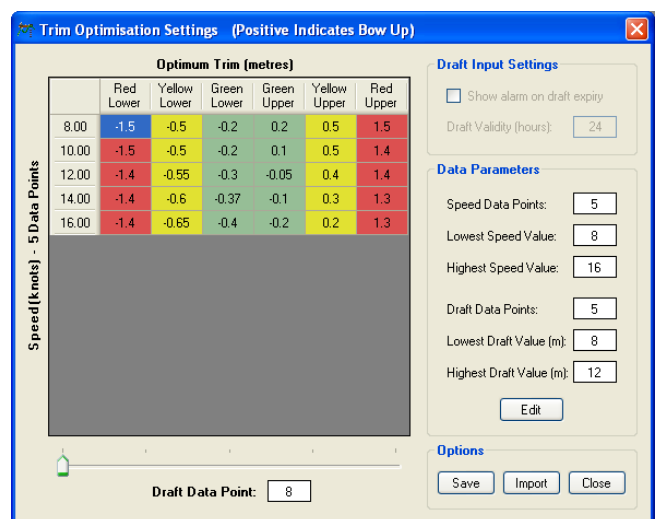
## Managing Trim

Any Marinestar® displays can be set to show trim information, when required.

The upper area of the trim display shows the current trim visually and numerically.

Below this, graphs comparing trim and speed update in real time. This tool allows the effect of trim adjustment on vessel speed to be assessed quickly and easily.

The time scale covered by the graphical display can be adjusted by the operator, to show periods of anywhere between fifteen minutes and one week.



Trim optimisation Settings

## Data Logging and Analysis

All trim and speed data is continuously recorded by Marinestar® automatically. Logged data can be viewed on screen, or exported to a spreadsheet for analysis at a later date.

