

Smart Cruising Assist Contributes to Fuel-Efficient Operation for Ships



Mitsubishi Heavy Industries Engine & Turbocharger, Ltd.,

In the operation of small commercial vessels and in fishery management businesses, the proportion of fuel expenses among all costs is high and fuel expenses are increasing every year. There is a significant need for energy saving measures.

To offer an efficient operation mode that is effective in reducing fuel consumption, Mitsubishi Heavy Industries Engine & Turbocharger, Ltd. (MHIET) developed a device for small vessels and fishing boats which, in the same way as devices developed for automobiles in recent years, displays the actual state of fuel consumption and average fuel efficiency in real time and allows vessel operators to conduct efficient energy saving operations at the optimum speed, contributing to the fuel-efficient operation of small vessels.

1. Explanation of this product

1.1 Functions of this product

In general products for displaying fuel consumption, a flow meter is installed at the inlet of the fuel piping for the engine to calculate the fuel consumption, which requires an expensive monitor and a data logger.

On the other hand, in small vessels, it is difficult to secure a space for a fuel flow meter in the engine room and significant installation cost is also incurred. As such, our company has independently developed Smart Cruising Assist, a product that estimates fuel consumption based on the engine performance without measuring the fuel flow rate.

1.2 Relationship between engine performance and fuel consumption

Figure 1 shows the method of estimating the engine output and the fuel consumption from the engine performance data detected in real time during actual operation using base data such as engine revolutions and boost pressure on dry land.

Our proprietary expertise on the calculation of fuel consumption from engine performance was applied to the software for this product, and a function of correcting individual differences between engines was also incorporated.

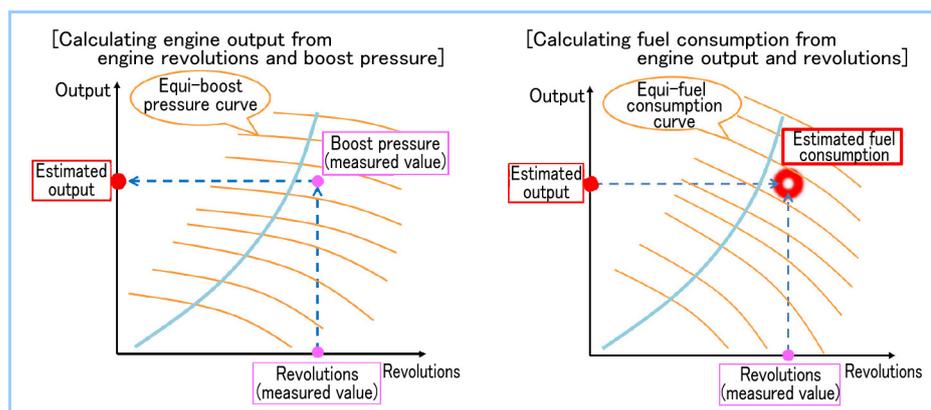


Figure 1 Method of calculation of engine output and fuel consumption

2. Features of this product

2.1 Overview and dimensions

Figure 2 depicts the components of Smart Cruising Assist and their dimensions.



Figure 2 Overview and dimensions of the system

2.2 Features

(1) Wheelhouse monitor

A tablet type monitoring device with a small and lightweight 8.5-inch wide LCD (WVGA) touch panel was adopted in consideration of mountability and ease of operation on a small fishing boat.

(2) Waterproofness

The product passed various environmental tests required for mounting on vessels. The sensor unit is waterproof (IP44) and the wheelhouse monitor is drip-proof on its front side.

(3) Location information

The built-in GPS function can display vessel speed and travel distance without external input of a position signal and can also visually display their correlation with fuel consumption in a graph.

(4) Installation method

The sensor unit is set in the engine room and connected to the power source and various sensors. It is then connected to the monitor in the wheelhouse using the supplied dedicated wires. Thus, Smart Cruising Assist can be easily installed in both existing vessels and new vessels.

(5) Measurement method

When the engine start signal is detected, measurement automatically starts. This prevents a failure to measure caused by forgetting to turn the system on.

(6) Screen configuration

As can be seen in Figure 3, screens showing different contents can be switched using the select buttons displayed on the screen.



Figure 3 Screen configuration

3. Advantages for the customer

1. Fuel-efficient operation

- (1) Making economical and optimum operations possible while monitoring both vessel speed and fuel consumption
- (2) Understanding vessel conditions at light load and full load and facilitating efficient operation in consideration of vessel speed
- (3) Efficient, energy-saving operation is carried out as planned facilitated with past operation data displayed on the screen

2. Facilitation of vessel management

- (1) Displaying cruising distance, vessel speed and relationship between vessel speed and fuel consumption
- (2) Making it possible to estimate arrival time and available cruising range by input of cruising distance
- (3) Automatically displaying timings of periodic inspection for the engine and maintenance for parts replacement recommended by manufacturer
- (4) Managing past operation states based on measurement data for use in future operation planning

4. Extended functions

As extended functions, Smart Cruising Assist will feature the following systems:

(1) Remote monitoring system

The remote monitoring system helps to collect operation state data from the vessel to the cloud using a communication system between the ship and land so that the data can be used by users and dealers, as well as within company (Figure 4).

(2) Onboard communication system

A radio communication system for onboard communication makes communications to several monitoring locations, including the wheelhouse and upper bridge, wireless (Figure 5).

(3) Autonomous operating system

The autonomous operating system assists energy-efficient operation.

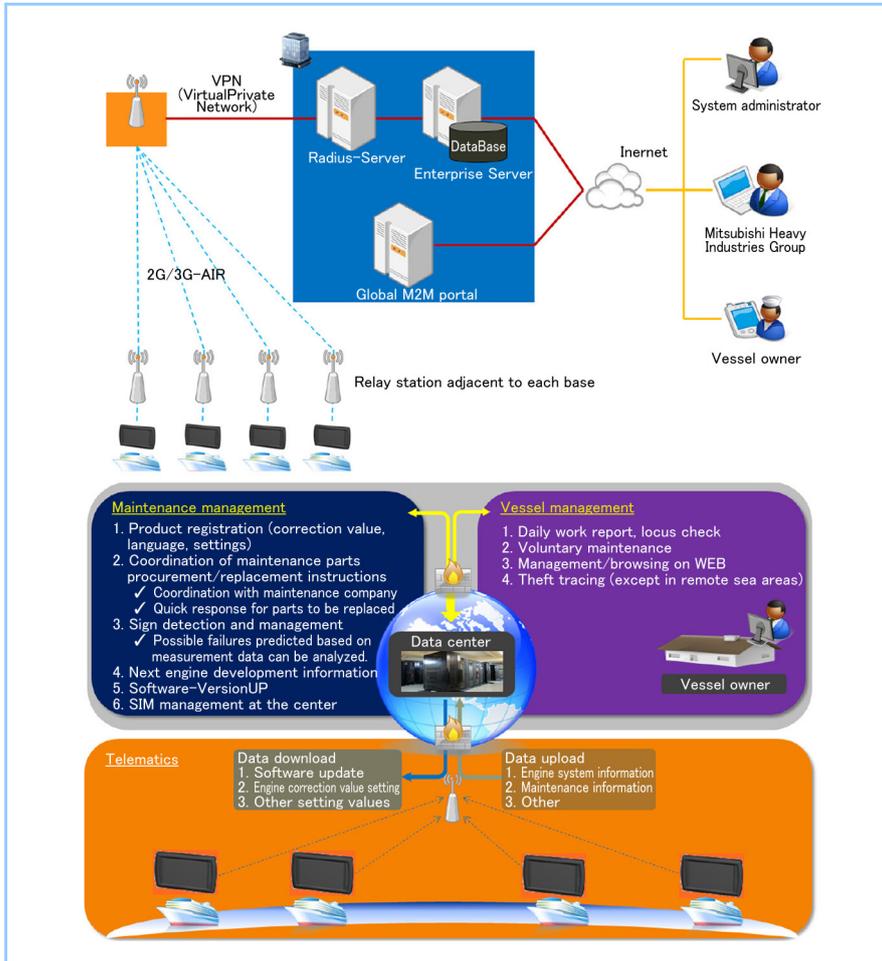


Figure 4 Remote communication system

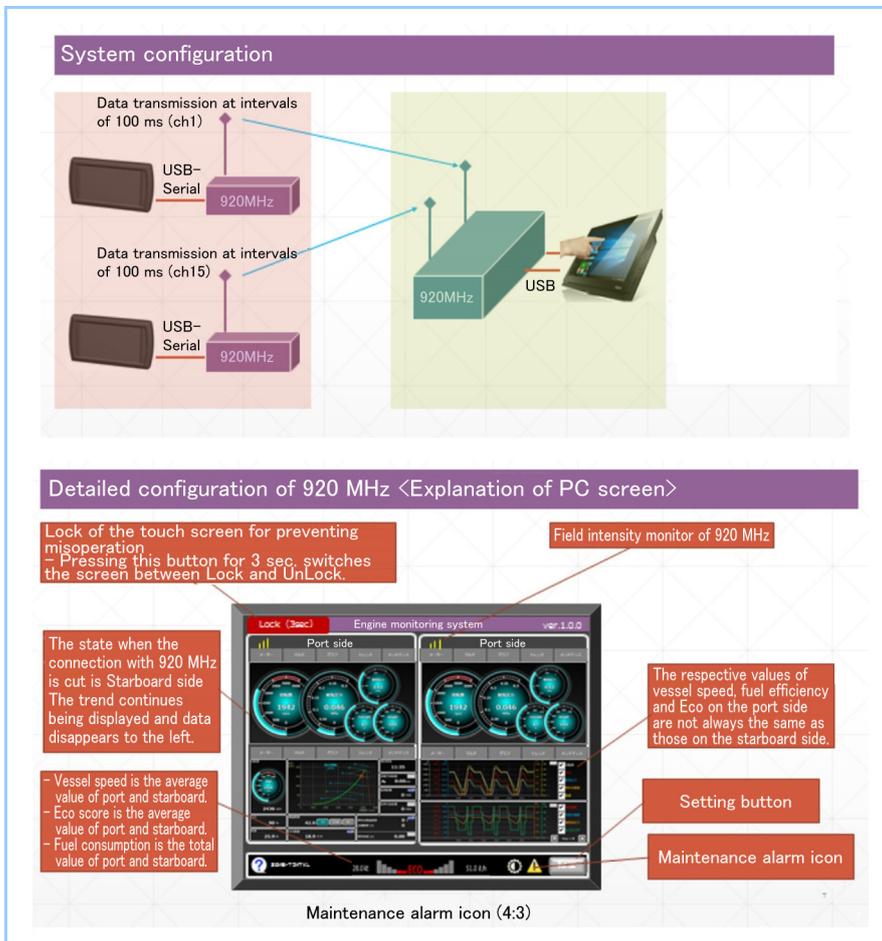


Figure 5 Onboard communication system

5. Future development

To meet increasingly diversifying customer needs, we plan to acquire product certifications from general incorporated foundation Nippon Kaiji Kyokai to enhance reliability and will reduce environmental load by realizing further energy-efficient operation and improvements in the workability of vessels.

Smart Cruising Assist is a registered trademark of Mitsubishi Heavy Industries Engine & Turbocharger, Ltd. in Japan.