Intelligent Energy Efficiency System

Overview

The Intelligent Energy Eficiency System refers to the use of advanced information technology, sensor technology, artificial intelligence, and automated control methods to achieve comprehensive perception, accurate analysis, and dynamic optimization of the ship's energy usage processes. The goal is to improve energy utilization efficiency, reduce fuel consumption and carbon emissions, and realize intelligent, visualized, and collaborative energy efficiency management.

The Intelligent Energy Eficiency System integrates functions such as fuel consumption monitoring, route optimization, equipment condition sensing, energy consumption prediction and analysis, and intelligent control. It supports ship-shore collaborative decision-making, helping shipowners and operators reduce operational costs and environmental impact while ensuring navigational safety and regulatory compliance.

System architecture

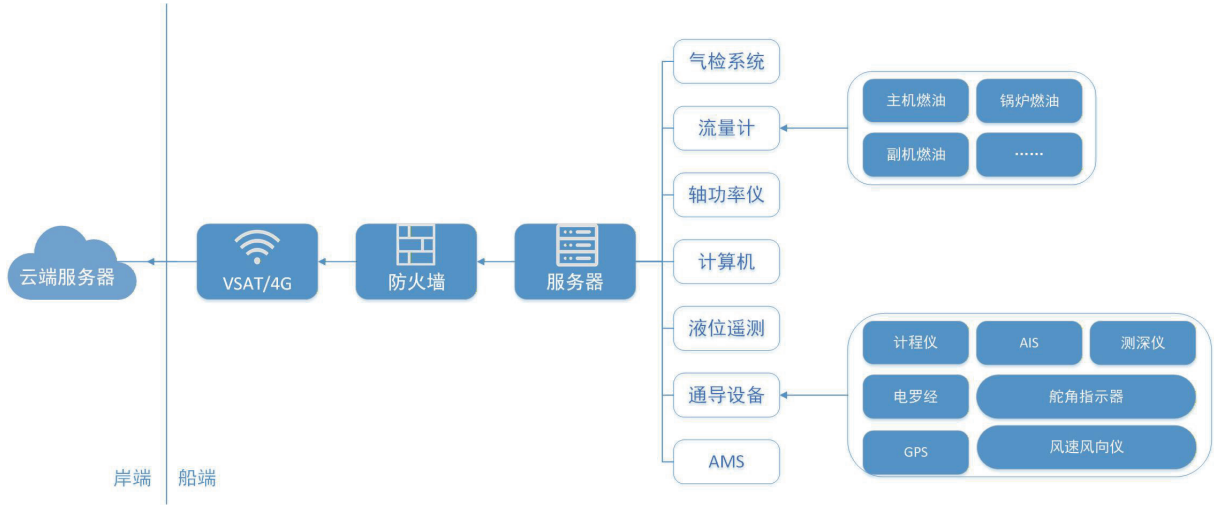

Figure 1 The Intelligent Energy Efficiency System

Product features

- Integrates real-time monitoring, dynamic optimization, and intelligent decision-making;
- High integration and modular design for easy installation and maintenance;
- Ship-shore collaboration mechanism enabling remote operation and management;
- Data-driven energy management supporting energy-saving and emission reduction evaluation;
- Open data interfaces for seamless system integration and future scalability;
- Visual dashboards and reporting tools to enhance operational efficiency;

Product function

- Real-time fuel consumption monitoring and statistics;
- Automatic calculation of energy efficiency indicators and trend analysis;
- Route, speed, and trim optimization recommendations;
- Subsystem energy consumption evaluation and analysis;
- Dynamic operating condition identification and energy-saving strategy recommendations;
- Remote energy efficiency monitoring and shore-based decision support;
- Carbon emission accounting and evaluation report generation;
- Support for multi-energy systems and new energy vessel types;
- Energy consumption assessment visualization and open data interfaces;

Product technical parameters

- System Indicators
  - System False Alarm Rate: ≤15%
  - System Miss Alarm Rate: ≤15%
  - System data storage duration: ≥1 year
  - Fuel consumption sampling rate: ≥1Hz
  - Energy efficiency calculation interval: ≤5 minutes per cycle

Software interface