Fuel and Performance **Systems** **– for all Vessels**
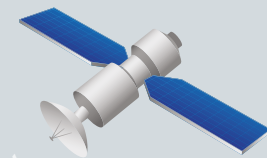
iNSATech

On board

DataLink

On shore

Fuel and Performance Monitoring
Real-time Decision Support

On board server
with database containing vessel data, model etc.

Bulk

Tanker

Cruise

...and many more.

On shore server or cloud storage
with data from entire fleet connected to the system.

Fuel Consumption System

The system presents past, present and accumulated consumption based on flow meter measurements for which error, alarm and warning logs are included to ensure the system integrity and reliability. The system also provides you with immediate cause and effect feedback.

Performance Monitoring System

The system utilizes a variety of sensor inputs to help you make real-time decisions and improve your vessels performance on speed, consumption, power, steam, charter party and behavior, through customized KPI calculation and visualization.

On board server

Vessel specific server that handles all data exchange between ship and shore.

DataLink

Linking vessels to shore operations, ensuring both sides have access to the same data. Intelligent connection monitoring and minimized data transfers with zero loss.

On shore server

Customer specific server or cloud storage that handles all data exchange between the fleet and Insatech.

Fuel Consumption System

Advantages:
- Optimize your operation by continuously collecting and recording vessel data
- Get real-time decision making
- Change behavior
- Reduce your fuel consumption and running costs (OPEX)
- Experience shows cost savings around 3-5%
- Reduce carbon footprint
- Increase competition

*The Insatech **Fuel Consumption System** is the first step in knowing what your performance is right now.*

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The Fuel Consumption System (FCoS) consists of several sturdy, reliable and accurate Coriolis mass flow meters and an operator panel that gives you real-time information about consumption and can alert you about possible issues with the flow measurement, such as leakages.

Increase Crew Awareness and Save Fuel
The real-time fuel consumption measurement can help increase crew awareness, for example, if you place the operator panel on the bridge, it will give the duty Officer immediate feedback about the fuel consumption when he makes changes to the vessel's speed and trim or even changes in weather conditions. This will continuously increase the crew's awareness about how operational changes affects the fuel consumption and can help them save fuel.

We Recommend Coriolis Mass Flow Meters
The Fuel Consumption System works by installing one or several flow meters, depending on how granular you want your measurement. The system can utilise your current flow meters, but we usually recommend installing Coriolis mass flow meters, at least on main consumers, because it gives you certain advantages.

The two most obvious advantages are the accuracy and that the flow meters measure mass directly. Volume based flow meters need additional temperature measurements and conversion tables to calculate mass, which increases the uncertainty of the measurement.

Another advantage of the Coriolis mass flow meter is that it can give you additional information about its operational status such as air bubbles in the fuel, when it was last zero-point adjusted and unexpected flow, just to name a few.

Accuracy Is Important
The accuracy is important, especially if you measure the fuel consumption as a partial flow, of a larger circulated flow, because this greatly amplifies the inaccuracy of the flow meter. The circulated flow can be as much as 50 times greater than the consumption, amplifying the inaccuracy 50-fold. If the circulated flow is 5,000 kg/h and the consumption is 100 kg/h then an accuracy of 1% corresponds to ±50 kg/h. Since the circulated flow is measured as the difference between inlet and outlet, you need two flow meters, and if you are lucky,

they cancel each other out, but in the worst case, they amplify each other resulting in an inaccuracy of ±100 kg/h on a consumption of 100 kg/h.

Detect Leakages
Depending on your setup, you can detect leakages in your system by cross referencing flow from several flow meters in your circulation loop, for example a leaky bypass or pressure relief valve.

(continued)

Fuel Consumption System

Main Engine Consumption

The display of the main engine overview provides a total view of the main engine's fuel consumption. A consumption trend line shows an accumulation of the most recent data. The setup is dependent on the number of installed meters.

Service Parameters

The service parameters displays raw data for each flow meter related to consumers. It shows the main menu data and provides a manual totalizer. From here the alarm status screens are set up. Furthermore the green light shows that the communication between flow meter and system is intact.

Generator Engine Consumption

From the Aux engine screen, you get an overview of all your auxiliary engines' consumption. As with the main engine overview, this also provides an easy to read display of consumptions, trends and engine loads.

Detailed View

If you want a more detailed view, simply select an engine from the overview screen. From here it is possible to get the actual and total consumption of the given engine, as well as values for engine inlet and outlet such as mass flow, volume, density, temperature and total mass.