2/57 Tech



Customized Solutions

Improve your Cll



www.insatechmarine.com

Insatech Solutions

Do You Need a Solution?

Insatech Marine was founded on the basis of a need for solutions; solutions our customers asked us to make, because they did not exist or the ones that existed did not quite meet the standards required or did not have the features that where needed.

Since the first prototypes of our Bunker Management Systems and Fuel Blending Units were made based on high accuracy Coriolis mass flow meters, many more systems from Insatech has seen the light of day. Still today many of our solutions use the Coriolis mass flow meters as main or significant components, but this is not the only common denominator they have. We still base all of our products on actual measurements and existing needs in the maritime industry.

The collection of data in signals and the following distribution of this data has become a big part of Insatech. Not only as a part of our own system, but also as a product and service in itself. This has provided us with a rather extensive experience with signals and electrical communications on board, and this experience is being put into all of our systems.

Our Systems Serve a Purpose

The 'urge' to help our customers and solve their measurement related challenges, has resulted in a range of modular and highly customizable solutions. Our goal has always been to listen and understand your challenges and then provide solutions that will help solve them. For us, each delivery is considered a project, since no two systems are identical. We adapt not only to the individual customer, but to the individual vessel. This is to make sure that our systems are based on one thing and one thing only; providing our customers with a tool that works for you. We want our customers to change their way of operating the vessel, but not in order to use our systems; we aim to have our systems provide the operators with knowledge and information that will make them want to optimize their operation, in order to do better because they can see they can!

Cooperation is Key

Even though we are also a supplier of instrumentation, we are aware that it is not always financially or practially possible to exchange either rather new or heavily customized instrumentation to our preferred makers and models. Therefore, we are very accustomed to working with all sorts of differend brands and suppliers. To this date, we have not encountered any instrument that we cannot communicate with. We like to think that we work with a 'double open ended' principle, where we can adapt our system (and instruments) to work with other makers equipment, both upstream and downstream.





Fuel and Performance Systems – for all vessels

On board



Fuel and Performance Monitoring





Performance Monitoring

The system utilizes a variety of sensor

performance on speed, consumption,

inputs to help you make real-time

power, steam, charter party and

behavior, through customized KPI

calculation and visualization.

System



On board server

with database containing vessel data, model etc.

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.

On board server

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

DataLink

Tanker



...and many more.

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.

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On shore





On shore server or cloud storage

with data from entire fleet connected to the system.

On shore server

Customer specific server or cloud storage that handles all data exchange between

Fuel Consumption System





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.

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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.



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.



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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.





Performance Monitoring System



The Insatech **Performance Monitoring System** gives you the flexibility to collect data from any source and makes it possible to implement ship wide performance improvements.

The second step of getting to know your performance is the Performance Management System (PMoS), which builds upon the FCoS platform and gives you the flexibility to collect data from any sensor on board. PMoS includes an expanded operator panel, that allows you to specify and calculate any Key Performance Indicator (KPI) imaginable. If you are missing data points for your KPI's we can help you collect that data by installing new sensors.

The KPI's you create, can help your crew improve the operation of the ship and help you save money by optimizing performance. The system contains a lot of valuable KPI's, and we are always ready to help you create new KPI's that support your business.

Compare Charter Party Terms with Actual Performance By using the PMoS you can compare contractual charter party speed, consumption, and weather clause with the current or overall voyage performance. This can help your crew keep within the charter party conditions. You can also see the accumulated consumption in- and outside the weather clause. When your vessels perform better your charterers can save money on consumption and you can earn money by increasing charter rates.

Increase the Flexibility of Your Current Data

The system can also give you more flexibility than your current systems. For example, your engine control system might measure exhaust gas temperatures across cylinders or banks of cylinders to ensure, they do not deviate too far from the average. But it might not be possible to monitor any other KPI's than the ones that are available. With the PMoS you can gather the sensor data and use it to make your own KPI's or set your own warning and alarm thresholds without the need to involve any third party. This gives you the power to create even better insight into your performance.

Shut It Down and Save Money

PMoS can also help create awareness about how the base load of the vessel impacts expenses. This can be done by showing how much it costs to run machinery and how much can be saved by shutting it down. This can be done calculating the price of running the machinery using the current consumption and the price of the fuel, which will make it easier for the crew to see, how running the machinery affects the costs.

Collect and Validate

The system is built by collecting data from available instrumentation, manual logs, meta and third-party data. The increase in datapoints makes it possible to cross reference data to identify faulty and inaccurate sensors. This is done to validate the dataset and make sure the KPI's are correct before you start drawing conclusions from it.



Cruise

On shore server or cloud storar with data from entire fleet connected

Typically, data comes from:

- Shaft power meter
- kWh counters on production and consumption
- GNSS signals
- Speed log
- Echo sounder
- Anemometer
- Gyro and gyro compass

Data can also include motion sensors and draught sensors, as well as any signal that goes into the engine control system, including alarm logs etc.

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Performance Monitoring System



Power Production

Discover how much time you spend running generator engines in parallel on low load, costing you fuel and wasting running hours that impacts maintenance costs. Set up KPI's for low load parallel running, and configure the thresholds for target, minimum and maximum load for each vessel individually, sister vessel groups or fleet wide. See your historical performance and compare it to your current.



Trim and List

Monitor your dynamic trim in real-time and compare it with your trim table to highlight any savings potential from changing your trim. Enable the crew to detect even minor angles of list, even when the vessel is rolling, to allow them to right the vessel and save fuel. Get an objective insight into how much the bow is pitching and how much the vessel is actually rolling, with indicators for maximum and average angels as well as angular velocity.



Boilers

Optimize your boiler operation by ensuring that the boiler is not starting and stopping unnecessarily often. Adjust steam pressure set points to reflect your current operational condition. Set up triggers to alert you to undesired running patterns.



Propulsion

Under sea passage conditions, your combinator curve may not offer the optimum pitch settings at the given speed. Improve your propeller performance by optimizing your propeller pitch. Benefit from constant power speed instruction, by adjusting your engine speed to changing external conditions to run at constant power. Ensure that you are running on or below your nominal propeller load index, to avoid heavy run on the propeller, stressing the engine, and lowering performance.





Bunker Management System



Do Not Pay for More Than You Get!

As fuel consumption is by far the single largest OPEX post, it is not only obviously beneficial to know how you use the fuel on board, it is also a clear advantage to make sure that you do not pay for more than you get. And this is where our Bunker Management System comes in handy.

Designed as a pro-active tool, our Bunker Management System, will continuously monitor all relevant parameters, such as mass flow, density, and pressure. Should any of the parameters that are monitored for any given reason off-set from the characteristics agreed upon before the delivery operation has begun, the system will alert the operator hereof. Depending on preferences, the system can be set up to take further steps if no corrective action or acknowledgement is done, such as sound an alarm, send a message to a predefined recipient or something else completely.

In this way, the system helps you control the bunker delivery and keep it within the agreed upon specifications, which in the end means less disputes and legal claims.

The system relies on a series of instruments and our in-house developed software, that in combination has proven itself a very accurate and trustworthy tool. Since the functionality, the controls and the operator's interface are developed and produced at our own facilities, customization is one of the advantages to our system.

Almost regardless of the circumstances and requirements from users, we can find a way to fit the system on board.

As implemented instruments are reduced greatly in value if the data they generate is not available, we make sure that you can get access to it. We have worked with instrumentation since 1989, and we know how useful the insights can be, and therefore one of our main philosophies is, that the data generated by the instrument purchased by you, also belongs to you.





Blending System

Product Characteristics Compliance – On Demand! The development in regulations on fuel for ships has resulted in a substantial increase in the available types of fuel, and subsequently a more diverse matrix of requirements regarding fuel characteristics.

Geographical restrictions, availability and price are some of the most common drivers when it comes to determining which fuel type to take on board vessels, and depending on vessel itinerary, previous deliveries and environmental concerns the availability of what is needed might vary greatly. For some operators the ability to have the supplier customize a pending delivery to current requirements can be of great value, and this is the capability our Blending System provides.

Our Blending System can be used to blend any type of fuel and the limitations are few. Typically, blends are made of a distillate and a residual fuel that are blended to reach a setpoint value in viscosity or two residual types with different sulfur concentrations, where the sulfur content defines the blend ratio. The blending process can either be completely controlled by actual measured parameters, or strictly by a fixed blend ratio - it is up to you.



We know that reliability is crucial, which is why we only use high quality instruments and components for which we have many years of experiences with, both as a supplier and as a system and service provider. In addition, the parts that are most exposed to stress and wear, are standard components that could easily be momentarily replaced by alternatives in the unlikely case that we are unable to provide spares or replacements within a short timeframe.





Installations



New Equipment

When you invest in new equipment or systems, the initial purchase cost is only half of the headache. Once the commercial part is in place, the new acquisition needs to be put to use so it can earn its cost as improved performance or regulations compliance. Often, this means lengthy periods of time where operations cannot be carried out and income is therefore put on hold. Furthermore, any unexpected delays in the installation can cause a shift in plans and difficulties in upholding otherwise planned jobs. All in all, updating or upgrading your vessel, can be a lot more expensive than just the invoice for the equipment.

Your Plans Can Shift – So Ours Can as Well

We have developed a particular skillset regarding installations, and we provide different ways of performing installations, all depending on your requirements and preferences. Our foremost priority is to adapt our job to allow for your operations to run as smoothly as possible within the given circumstances. By allowing you to operate your vessel, we can often not only save you money but also allow you to continue operations as planned.

Different Situations Require Different Solutions

We offer different types of installations, and we can tailor a job, so it suits you best.

Installation During Dry-dock

When your vessel visits dry-dock for planned maintenance, it is a golden opportunity to do installations, as the restrictions are few and it is possible to work continuously. Usually we will perform this type of installation with a Supervisor from our team and then make use of the opportunity to source further Technicians on site.

Installation as Sail-along

Installing larger systems or instrumentation that requires larger modifications can often be done during sail-along. We will board the vessel in one port with our crew, who will have an action-plan ready beforehand. This plan will be developed and adapted in coordination with the vessel's crew up front, allowing to work on piping during the normal operation - with no interruptions of the daily itinerary.

Hub-installation at a Strategic Location

In the case of multiple installations of systems on a fleet (or part of it), we can set up a hub in a strategic and logistically central location, from where our crew will board the vessels as they arrive, and then perform installations during cargo operations. In this setup, we will typically bring a crew that is specifically chosen for the specific installation along with a skilled Supervisor of our own.

Pre-fabrication

Any disruption in the operation of a vessel can be a costly affair – planned or unplanned. To minimize the time required to install our equipment, i.e. fuel flow meters for a main engine, we do our best to plan and bring in as much piping pre-fabricated as possible. Thorough surveys and measurements allow us to bring down the amount of time necessary to complete installations in critical locations.

Increase your competitive advantage by reducing costs via performance and efficiency improvements on your vessels.

MARINE

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