PRECISE CONSUMPTION DATA IN THE SHIPPING INDUSTRY

DIMAR-TEC supports

environmentally friendly shipping

The reduced consumption of resources and reduced CO_2 emissions are also an important issue in the shipping industry. The »Fuel Efficiency Controller« (FEC) from DIMAR-TEC offers a system that measures the actual fuel consumption with a high degree of precision in accordance with ISO 3046 requirements. The requirements of several customers brought the company one step further: The »Energy Efficiency Controller« (EEC) ensures a guaranteed reduction in fuel consumption. Bachmann's M1 controller is also the core of the solution here.

DIMAR-TEC is a trailblazer in areas such as Green Shipping or Maritime 4.0. The company is intensively engaged in researching how to accurately measure the different fuel consumptions on ships in order to identify potential savings in resources and in CO_2 emissions.

Reduced fuel consumption and clean environment

Since 2003 DIMAR-TEC has been a supplier of sensors and technical services for optimizing the performance of ship engines. The fuel costs for a medium-sized to large container ship are 3 to 6 million US dollars a year. Even small savings in fuel oil consumption are worthwhile. The specific fuel oil consumption (SFOC) is one of the key factors in the performance of a drive system. »However, with conventional data acquisition systems this can only been determined with great difficulty. The tolerance of the data is also often greater than the optimization potential, so that the reality often does not match up to expectations,« CEO Olaf Kuss explains.

Well thought-out sensors

The fuel oil used by ship diesel engines is often subject to considerable variations in composition and thus also in energy content. In order to determine the consumption data precisely according to ISO 3046, air pressure, relative humidity as well as different performance characteristics must also be taken into account as well as the density of the fuel oil: Only in this way can a reference index be determined, by which measured data can be reliably compared over long periods of time. DIMAR-TEC's fuel efficiency controller (FEC) is such a system, which records all the required background conditions at different points in the drive and auxiliary system with 20 to 30 sensors. »The FEC enables us to show different characteristic values and specific maritime performance indicators in real time. It also allows us to record all the data at intervals specified by the customer as statistically relevant mean values according to the requirements of ISO 3046,« Olaf Kuss explains. This enables shipping and charter companies to assess the consumption values precisely, compare them with the data of other ships and fleets, and take any necessary measures to save fuel and quantify the results.

Auxiliary systems in view

Guaranteed savings in fuel consumption can be achieved by optimizing cooling water pumps and fans. »The Energy Efficiency Controller (EEC) was therefore developed as an upgrade module for the FEC at the customer's request,« Olaf Kuss explains. Auxiliary systems are designed for a maximum load and are also normally operated at this level. The EEC regulates their performance down to the actual requirements. In this way, it is possible to save at least 75 percent of the electrical power required for the auxiliary systems – this is DIMAR-TEC's guarantee.

DIMAR-TEC PTE LTD

DIMAR-TEC Pte. Ltd. is headquartered in Singapore, the Asian shipping metropolis, and specializes in the optimization of diesel units in ship operation. Founded in Singapore in 2003, DIMAR-TEC now operates worldwide with service centers in Singapore, Germany and the Philippines.

www.dimar-tec.com

» Using the Bachmann M1 as a basis DIMAR developed solutions with a flexibility and service friendliness that was previously unachievable. «

Olaf Kuss,
CEO, DIMAR-TEC Pte. Ltd.

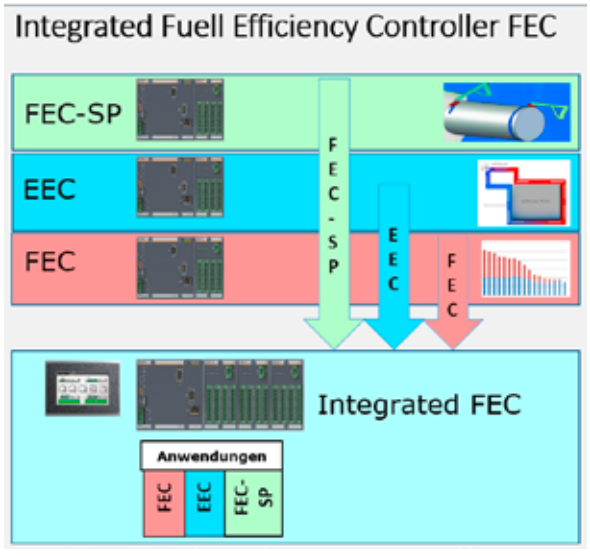
Challenging operating conditions in the maritime industry

»Our system is based on an M1 controller from Bachmann. As several applications can be run simultaneously on this system, we also developed the »FEC-Shaft Power Meter« (FEC-SP) based on this platform,« Olaf Kuss explains. »The benefit here is that we can offer a highly reliable and easy-to-install standard product for integration in our existing systems at half the standard market price.« The FEC-SP is used to measure the power at the drive shaft. If this is placed in relation to the actual fuel consumption and the environmental conditions, any problems with the engine or its degree of efficiency can be easily identified. The aim here is to ensure the optimum operation of the engine at all times: »Generally, this is the case at 80 percent of the engine output.« Due to the versatility of the M1 platform DIMAR-TEC's FEC-SP is also available as a mobile version FEC2GO!. This enables the company to provide shipyards with the perfect tool for test runs, for ship owners who have to calibrate their ship engines, and service companies wishing to carry out before/ after comparisons after repairs.

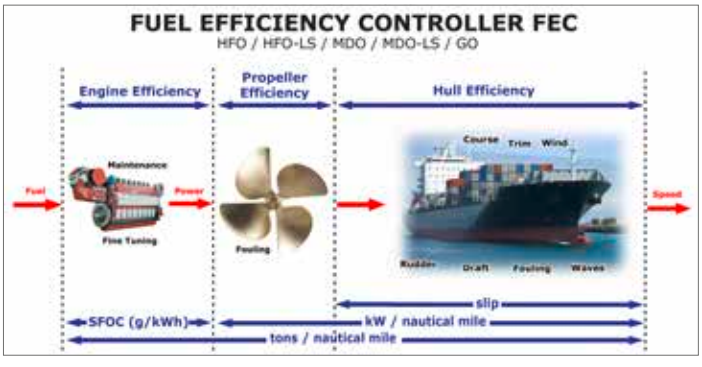
Safe and straightforward parameterization and operation

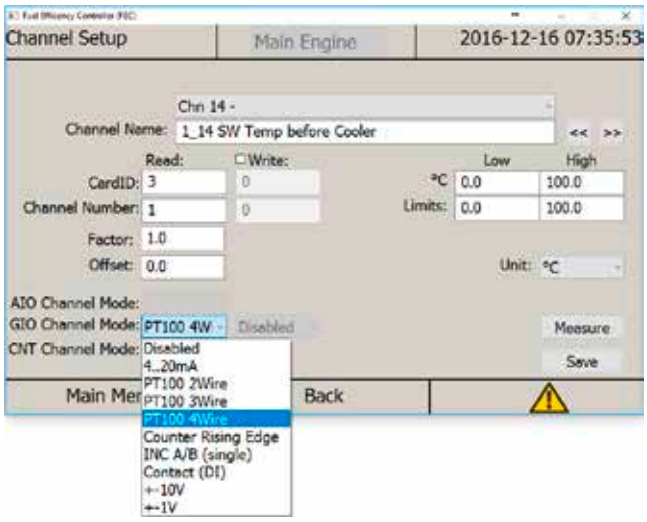
For DIMAR-TEC it was clear from the start that their solution had to offer the ability to be parameterized as required and to be commissioned by service technicians or the ship's crew without any programming knowledge. This is because system modifications sometimes have to be carried out when a ship is commissioned, or for example when a faulty onboard sensor output has to be replaced with a different signal. The ability for personnel to make the necessary adaptions in the field simply and quickly is a

▼ The three software modules FEC, EEC and FEC-SP are available as stand-alone systems as well as integrated complete solution.

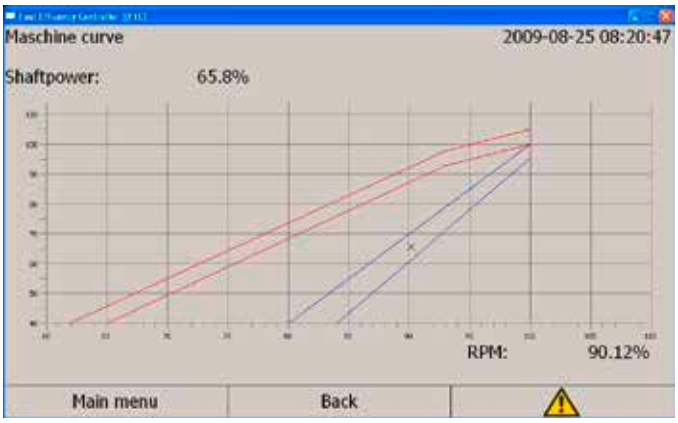


▼ If the output at the drive shaft is placed in relation to the actual fuel consumption and the environmental conditions, optimum and eco-friendly ship operation is ensured.





▲ The software modules can be assigned parameters as required via PC or touch screen without having to change the code on the PLC. This is critical since incorrect signal specifications can be adjusted by the ship's crew during a retrofit.



▲ Clear graphics indicate deviations from the ideal operating point and thus enable the optimization of fuel consumption: Display of the shaft power as a function of engine speed. Operating limits and the overload curve are included as a reference.

benefit here. »Together with Bachmann electronic, we were able to achieve this,« Olaf Kuss confirms. All input and output signals can be assigned individually via a touch display or the JAVA visualization for standard PCs without the operator having to intervene in the PLC program. Users can thus work with the system safely and simply. »We are able to integrate all our knowledge about shipping systems in a project during the engineering phase so that size, interfaces and customer expectations are fully clarified before the installation is started. The installation can finally also be carried out by the ship's crew or by external service partners. If DIMAR-TEC carries out the installation, the costs for it can be guaranteed, which in turn considerably reduces project risks and costs for the shipowner,« Olaf Kuss explains the benefit.

True companion on the way to success

DIMAR-TEC is highly satisfied with the overall result: »Our system boasts an impressive performance. Thanks to the modular design, we can implement the perfect solution for any shipowner.« The three FEC, FEC-SP and EEC modules are independent of each other and are available as stand-alone solutions. However, they can also be installed as an integrated system since the modules can be operated in any required combination on only one controller. »This is a benefit that only the Bachmann solution could offer,« the CEO emphasizes. »We were always in touch with our personal contacts in sales and service, who also know our specific application. This proves that the choice of Bachmann as our long-term and future-oriented partner was the right one.«

▶ Compact solution: The FEC is installed in the engine room and thus minimizes the cabling with retrofits.