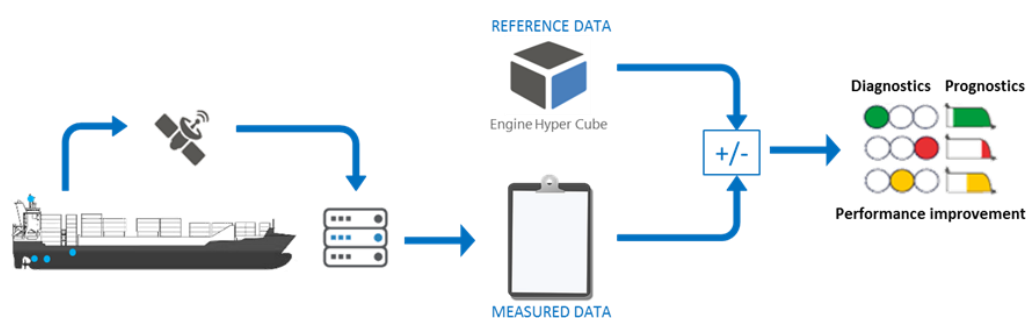


Propulsion Analytics

offers **engine performance monitoring** products and services, based on state-of-the-art smart data technologies that guarantee **reduction of operating cost and minimum engine downtime**

Engine Hyper Cube

Advanced software for engine performance monitoring, diagnostics and optimization



The shipping industry is nowadays entering the era of asset performance management & condition-based maintenance. The two pillars essential for this, are those of **measuring** and **benchmarking** (comparing with a reference). Today's data acquisition systems, along with advanced ship to shore

communications, provide a solid basis for the primary source of information needed. Measured data, however, need to be filtered and processed, in order to obtain any useful results. Performance evaluation and diagnostics, depends on reliable dynamic benchmarking reference for the actual operating conditions.

The **Engine Hyper Cube** software, based on a detailed thermo-physical process model of the engine, custom-produced for each vessel, addresses this very issue and provides the "Expected/Healthy" **engine performance** for **any possible engine operation setting, ambient conditions and fuel**.

The ship owner/operator, by comparing any incoming engine monitoring measurements to the **Engine Hyper Cube** output, can reliably:

- auto-diagnose possible engine faults as well as sensor/measurement issues
- determine fuel consumption, emissions and assess engine performance parameters
- predict developing faults towards condition-based maintenance, or
- estimate complete performance/emissions, under any other engine operating conditions (what-if scenario)

Proven Solution

Over the past few years, hundreds of engine issues have been identified for our customers

The **Engine Hyper Cube** software, provides the user with:

- high-level summary view of engine performance
- detailed diagnostics of possible engine faults together with recommended actions
- detailed diagnostics of possible sensor and/or measurement issues
- deviations from healthy state for a number of measured parameters
- detailed per-cylinder view and historical analysis on a number of engine parameters, as well as
- sister vessel/engine comparison



There is nothing more valuable than an **early detection** of a developing issue. See below yearly loss of fuel (for a 15MW engine):

- | | |
|--------------------------------------------|-------|
| • worn injection pump elements | 415tn |
| • partly blocked T/C, or dirty nozzle ring | 250tn |
| • Worn injection nozzles | 165tn |
| • dirty intake filters | 165tn |
| • partly blocked charged air coolers | 165tn |

What makes us unique

Pioneering the use of smart data analytics during operation ...at the heart of the Greek shipping community!

Our team has pioneered the use of engine simulation models for marine engine performance evaluation in service. We combine theory, wide experience in marine engineering, **smart data analytics** and state-of-the-art I.T. solutions to offer an innovative and easy-to-use product for engine performance monitoring and diagnostics.

We can integrate the Engine Hyper Cube software to any existing data acquisition, storage and transmission system, on-board or at the shore office. This allows you to get best value, obtaining **return of investment within just few months**.

Propulsion Analytics
Extracting meaning from data