Setel’s SeeMBox-V
Real-time remote monitoring of your vessel over FleetBroadband

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Revison history table

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1. **Overview**

The three drivers for investigating further potential savings on board vessels are rising operating costs, fierce competition and stricter environmental rules for emissions control.

**SeeMBox Efficiency Planning Concept**

Setel's SeeMBox-V is a unique solution which allows users to collect and process all the information necessary to devise a ship's energy efficiency plan and sustain it by accurate and reliable monitoring.

**Real-time signals view**
2. **Typical users**

The SeeMBox-V solution enables maritime companies to monitor all equipment on board their vessel(s) independently of make and type as long as there is digital or analog output.

All data is collected and stored on board while at the same time it is automatically synchronized with the office server. The system's typical uses include:

- Real-time monitoring of alarm monitoring system (AMS)
- Navigational data
- Fuel Bunkering reports
- Fuel Consumption monitoring
- Energy Efficiency Operational Indicator (EEOI) and emissions reporting

3. **Key features**

The SeeMBox-V's main features can be summarised as follows:

- Real time monitoring of vessel operational metrics at extremely low volume and bandwidth requirements (lowest requirements in the market)
- Historical data repository may be used to extract valuable information and daily reports easily
- Interactive mimic drawings provide unparalleled support if in distress
- Enhances responsiveness and improves assistance from the shore in distress situations
- New operational performance module enables decision support in real time, allowing economies in operation by adjusting operational models
- Seamless monitoring of equipment behaviour can significantly reduce maintenance and repair costs
Example of engine power & performance monitoring screen

Example of fuel consumption & EEOI screen
4. **Benefits to FleetBroadband (FB) users**

Setel’s SeeMBox solution offers the following main benefits:

- Reliable connectivity ensured by FleetBroadband’s global coverage
- Predictable costs since the user controls allowable data traffic
- Behavior Trends evaluation lead to loss prevention and minimization of a fleet’s running costs enabling Condition Based Maintenance (CBM)
- Real-time monitoring of a vessel’s fuel consumption, bunkering, (energy efficiency operational indicator/energy efficiency design indicator (EEOI) and nitrogen oxide (NOx), sulphur oxide SOx, carbon dioxide (CO2) emissions
- It is maintenance free and simple to use. The complete data synchronization cycle is fully automatic and unattended
- Minimal bandwidth requirement for data transfer (typical system needs less than 50 megabytes/month for around 200 continuously acquired signals)
- Company customisation is available.

5. **Setting up SeeMBox**

Before installation, the customer must fill out a questionnaire prior to an onboard survey. The purpose of the survey is to evaluate all the requested systems and identify the optimal way of acquiring the necessary information. The final scope of work is prepared before the actual installation.

During the installation, marine type approved equipment is used to acquire and process the requested information. All information is stored locally on a vessel server and is also transferred to the customer’s office through the satellite terminal in real-time. If the connection is dropped for any reason the data will be synchronised automatically.

The client has access at the office to all data, including historical information, and can either visualise the vessel’s systems in real-time or run reports on demand.

Setel Hellas will also train staff and deliver 24/7 support including annual maintenance and software upgrades.

**Equipment needed**

- Data acquisition modules (installed by Setel)
- Server on the vessel running 32-bit Windows
- Satellite terminal with FleetBroadband and/or GX
- Server at the office running Windows OS
### 6. SeeMBox technical summary

The SeeMBox technical features are summarised below:

<table>
<thead>
<tr>
<th>Features</th>
<th>SeeMBox</th>
</tr>
</thead>
<tbody>
<tr>
<td>Types of satellite terminals supported</td>
<td>FBB 150, 250, 500 and GX</td>
</tr>
<tr>
<td>Data connection</td>
<td>Real-time configurable (every 1 to 10 seconds)</td>
</tr>
<tr>
<td>Data synchronisation</td>
<td>Automatic/Unattended</td>
</tr>
<tr>
<td>Vessel data storage</td>
<td>Depends on number of acquired signals (6-12 months typically)</td>
</tr>
<tr>
<td>Reporting</td>
<td>User configurable (may superimpose and compare data from several vessels)</td>
</tr>
<tr>
<td>Alarm monitoring system</td>
<td>Standard feature with option for audible indication</td>
</tr>
<tr>
<td>Navigational data</td>
<td>Standard feature with map location tracking</td>
</tr>
<tr>
<td>Engine control room (ECR), ballast control room (BCR), cargo control room (CCR), flow meters</td>
<td>Optional</td>
</tr>
<tr>
<td>Visualisation options</td>
<td>Analog, digital gauges, individual signals or groups (bar charts) user definable</td>
</tr>
<tr>
<td>Signals and alarms view</td>
<td>Real-time and historical with playback option</td>
</tr>
<tr>
<td>Mimics</td>
<td>Existing or new per customer's request (e.g. ballast control, cooling system, power plant etc.)</td>
</tr>
<tr>
<td>Fuel consumption and performance calculation</td>
<td>For ME and AE in total or separately including emissions calculations and automatic EEOI calculation.</td>
</tr>
<tr>
<td>Prevention action protocol</td>
<td>User defined rules allows prevention scenarios using the prevention action protocol solution</td>
</tr>
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</table>
7. **Test results**

SeeMBox over FleetBroadband creates a small amount of traffic only, with data being transferred selectively. A data optimisation engine merely transfers differences and the bandwidth requirements therefore become minimal. Each reading on the vessel may also be independently sampled at a different rate, depending on how fast it changes. In addition, the end user can decide on-demand on the vessel-shore synchronisation rate, which ranges between 1 and 10 seconds and reduces the data footprint even further.

The following table gives an estimate of data transferred based on an actual SeeMBox installation on board a bulk carrier including navigational, access method services (AMS) and fuel consumption readings.

**Data traffic requirements**

<table>
<thead>
<tr>
<th>Number of signals</th>
<th>Vessel/office sync rate</th>
<th>Data transfer/month</th>
<th>Equivalent data footprint</th>
</tr>
</thead>
<tbody>
<tr>
<td>250 (typical AMS, navigational and fuel consumption)</td>
<td>1 sec</td>
<td>500MB</td>
<td>200 bytes/second</td>
</tr>
<tr>
<td>250 (typical AMS, navigational and fuel consumption)</td>
<td>5 sec</td>
<td>100MB</td>
<td>200 bytes/5 seconds</td>
</tr>
<tr>
<td>250 (typical AMS, navigational and fuel consumption)</td>
<td>10 sec</td>
<td>50MB</td>
<td>200 bytes/10 seconds</td>
</tr>
</tbody>
</table>
8. **Customisation required**

The customer may ask for any customisation of the system’s visualisation options. User defined mimics may also be added. Options for acquiring new signals or systems on board the vessel can be added.

9. **Further details and support**

For general enquiries:

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