VMS FOR FISHERIES

- Hybrid Communications
- Extended Temperature Range
- Inherent Safety and Security
- e-Logbook
- Embedded Geozones
- Data Encryption
BlueTraker® VMS terminal

VMS for fisheries

The basic function of the VMS (Vessel Monitoring System) is to provide regular reports of the fishing vessel’s location, speed and report on catches to the fisheries management authority. National FMCs (Fisheries Monitoring Centers) are performing tracking, monitoring and surveillance of fishing fleet activities and VMS is their basic tool.

BlueTraker® VMS system with Iridium satellite communication and true global coverage tracks fishing vessels wherever they might be. Fishermen will cut cost automatically and effectively by choosing BlueTraker® VMS Hybrid terminal that enables position reporting and other data to be sent over GSM/GPRS network when in reach.

National fishery authority have to decide about the optimal VMS system that would give the right measure of technology vs. invested funds, expected benefits and effective usage in the years to come. With many advanced features, technology and references BlueTraker® VMS is the right answer.

With BlueTraker® VMS SAT and BlueTraker® VMS Light, both utilizing satellite only communication channel and BlueTraker® VMS Hybrid terminal that offers the best of European technology, utilizing dual communication channel - satellite and GSM/GPRS, with features and benefits not been surpassed by any other competitor.
Hybrid Communication Channel – SAT and GSM/GPRS

Most common vessel tracking devices communicate telematic data only through satellite networks, thus leaving fishermen marooned paying high position reporting costs. BlueTraker® VMS Hybrid terminal reduces costs automatically and effectively, while using the low cost GPRS communication. BlueTraker® VMS Hybrid terminal can be configured according to several reporting schemes.

The most economic one is that on the high seas tracking data is transferred via satellite communication channel, and while in coastal waters, when a secondary low cost mobile network is available, by GPRS. BlueTraker® VMS can also send additional high resolution data that was stored in the internal memory of the device, by GPRS. The data latency on the high seas is in the range of one minute, while in coastal waters it is measured in seconds.

BlueTraker® VMS Hybrid terminal is used for transmission of geo location, short bidirectional messages - alarms and catch reports – e-Logbook via Iridium satellite or the GPRS network.

Message data encryption and authentication

Preventing unauthorized data modification, a symmetric 256bit key authentication method is used. Next to encrypting data before transmitting it, the BlueTraker® VMS terminal prevents sending unauthenticated external data (e.g. »Catch« reports) to the Fisheries Monitoring Centre.

True global coverage

Using Iridium LEO satellite network, the BlueTraker® VMS can report its position, send alarm and transfer »Catch« report anywhere on Earth’s surface, offering unprecedented advantage to National Fisheries Authorities, tracking globally dispersed fisheries fleet. Global coverage includes Sea Area A4, Earth’s polar regions, surviving the temperatures up to -50°C.

Remote fishing gear monitoring

Large variety of connectivity and integration possibilities offers virtually unlimited number of on-board fishing gear sensors to be monitored directly from the Fisheries Monitoring Centre. This enables the authority to automatically and precisely assess the fishing effort, processes in place on board the vessels, for each and every vessel in the fleet.

Embedded Geozones

Up to 100 (one hundred) geographical areas (polygons and associated rules) in the form of geo fences can be remotely uploaded, edited, activated and deactivated for each and every BlueTraker® VMS terminal, using land based servers and over-the-air upgrade feature. Geographical areas can be defined of specific type and can include specific operational rules (e.g. reporting frequency) and also be alerted when vessel is approaching and crossing geographical areas borders.

Fully approved and certified

The BlueTraker® VMS is fully compliant to all relevant laws and regulations defining Vessel Monitoring Systems for Fisheries operational guidelines (e.g. IEC 60945, IMO Resolutions, EU). It also complies to EU, NEAFC, NAFO and SEAFO regulations on data exchange, and to bilateral agreements commonly made between countries. A special emphasis was made on EU Commission Regulation Nos. 2244/2003, 1224/2009 and Implementing Regulation No. 404/2011 compliance. Not only that, it exceeds the requirements offering especially tailored features recognized as essential by various government bodies inside and outside the EU.

eLogbook ready

The BlueTraker® VMS contributes to worldwide e-Logbook initiative helping to eradicate Illegal, Unregulated and
Key features and benefits

Features

Communication
- Dual communication channels [Hybrid] option:
  - satellite communication through the Iridium satellite network with complete “Pole-to-Pole” coverage
  - GSM/GPRS terrestrial communication.
- Bidirectional communication with Fisheries Monitoring Centres.
- Includes Poll, RIC and Standby commands.
- HRDR - High Resolution Data Request [Hybrid].
- Internal memory for storing high resolution reports to be transferred on request.
- e-Logbook support for catch report delivery.
- Data delivery to any third party VMS software application, compatible with Iridium, Inmarsat-C, NAF and proprietary BlueTraker® protocols.
- FOTA - Firmware Over The Air functionality [Hybrid].

Safety
Safety at sea is a foremost concern of the fishermen and fisheries regulators. Fishermen life on sea gets often stressed to the limits by the elements of nature, equipment failures and human errors as well. In distress, the Alert Button (AB) functionality is there for fishermen to call for assistance. The BlueTraker® VMS Alert Button is unique - it will operate even when the ship's own power will go down – not a seldom situation in a distress on the sea.

Another unique feature of AB functionality is the distress call acknowledgement message, which tells the fishermen in distress that their message was received by the designated rescue service.

Security
Several layers of temper proof design offers unprecedented security level not reached by others on the VMS systems market yet:
- elevated level of security with all antennas, communication modules and a back-up battery, embedded in a double shell housing, appropriate for outdoor mounting.
- antennas cannot be disconnected,
- tamper alert sensor for unauthorised opening of the device,
- compliance with the highest security standards and requirements (maritime electronic equipment standard EN 60945, Commission Regulation (EC) No. 2244/2003),
- highest security of VMS data:
  - BlueTraker® VMS terminal encrypts all data it transmits,
  - Secure Socket Layer (SSL) and HTTPS security and authentication protocols are used for communication between satellite land stations and FMCs,
  - in the event of a power outage, the back-up battery powers the terminal for many hours; a position report, together with a power loss alert is sent out.

Unparalleled connectivity options
All connections are done through BlueTraker’s® ConBox, which also enables the captain to select the “In-port” status of the vessel. That reduces the reporting interval when berthed thus considerably reducing also the communication costs.
Design and operation

• robust, weather resistant double shell housing,
• mechanically and electrically fully integrated design containing all communication modules and SAT, GSM and GPS/GLONASS antenna,
• exceptional autonomous operation of up to 72 hours, with embedded back-up battery,
• compatible with any third party VMS software.

Benefits

BlueTraker® VMS offers a wide array of unparalleled benefits, unequalled on the global market:

• lower operating costs and high frequency of position reports at the same time,
• seamless automatic switching from GPRS to SAT channel and back,
• low installation cost and improved safety and security through one-cable installation, connecting the device to the power source,
• no need for any on-site intervention using over the air firmware upgrading,
• reliable and cost-efficient operation through a robust and maintenance-free device,
• enables integration with the existing FMC infrastructure regardless of the communication channel,
• operates for up to 3 full days on the embedded battery in the event of a power failure,
• simple mounting with a RailMount or UniMount mounting kit,
• unrivalled safety and security level, and
• Latest GSM, GPS and Glonass technology from SIMCom Wireless Solutions embedded.

Security and safety features

a) Stainless steel screws
b) Strong stainless steel RailMount
c) Double shell housing, an utmost environmental protection with electronic tampering detection
d) Status LED indicators on the housing, easy visual power and signal presence
e) Cable connects through a connector, compact environmental protection
f) Security seal with the serial number
g) Laser engraved unique product serial number
h) Laser engraved technical declaration

An all integrated design with no antenna cables!

Instalation options:

**UniMount**
mounting on a vertical or horizontal tube/rail (1/2” to 3”)
flush installation or wall installation

**RailMount**
mounting on a vertical or horizontal tube/rail (1/2” to 3”)

Scales

Gear-in / Gear-out sensor

ERS (e-Logbook) entry terminal

SAE J1939 based Engine Power Monitoring

Supply
BlueTraker® VMS system is built using three key elements:

- BlueTraker® VMS terminals;
- TDS (Telematic Data Delivery Services) communication server;
- FMC (Fisheries Monitoring Center).

The onboard BlueTraker® VMS terminal collects vessel positions using GPS/GLONASS satellite signals and sends them together with speed, heading and sensor data to the TDS communication server. BlueTraker® VMS intelligently sends data via both the GSM/GPRS terrestrial network and via the satellite network at predefined intervals.

The TDS communication server processes the received data and delivers it to any third-party VMS Fisheries Monitoring Software application in the appropriate format which usually runs at FMC premises.

Applications

- Commercial fisheries vessels.
- FMC fisheries monitoring centers.
- National VMS projects.

ISO 9001:2008
Quality management system certificate
## Physical

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Outer dimensions:</td>
<td>198 mm (width) × 198 mm (length) × 67 mm (height)</td>
</tr>
<tr>
<td>Weight</td>
<td>1140 g (including one back-up battery)</td>
</tr>
<tr>
<td>Housing</td>
<td>Double shell housing, light colour outer shell, resistant to UV solar radiation.</td>
</tr>
</tbody>
</table>

## Environmental

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating temperature:</td>
<td>-40°C to +85°C; Arctic kit option: -50°C to +85°C</td>
</tr>
<tr>
<td>Storage temperature:</td>
<td>-40°C to +85°C</td>
</tr>
<tr>
<td>Humidity</td>
<td>10% to 100% Relative Humidity including condensation</td>
</tr>
<tr>
<td>Dust &amp; water ingress</td>
<td>IP68 protection class (depth 6m, duration 30 min.)</td>
</tr>
<tr>
<td>Vibration</td>
<td>IEC 60945:2002, 5 Hz – 13,2 Hz sweep sine, displacement 0,001 m, sweep rate 0,5 oct/min; 13,2 Hz – 100 Hz sweep sine, acceleration amplitude 7 m/s², sweep rate 0,5 oct/min</td>
</tr>
</tbody>
</table>

## Electrical

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input Voltage Range</td>
<td>8 V DC to 36 V DC (max. supply cable length: 50 m)</td>
</tr>
<tr>
<td>Nominal Supply Voltage:</td>
<td>12 V DC or 24 V DC</td>
</tr>
<tr>
<td>Power Consumption (Average)</td>
<td>2W @ 12 V DC, Arctic kit option 18W @ 24 V DC</td>
</tr>
<tr>
<td>Input Protection</td>
<td>Resettable fuses, Level 3 ESD protection according to ISO 61000-4-2, Overvoltage protection above 36 V DC, Load Dump protection according to ISO 7637-2:2004(E) (pulse 5a), ISO16750-2:2012 (load dump)</td>
</tr>
<tr>
<td>Special Protection</td>
<td>Vessel battery overdischarge protection</td>
</tr>
<tr>
<td>Back-up Battery</td>
<td>LiPoly battery (from 1000 mAh up to 8400mAh)</td>
</tr>
<tr>
<td>Autonomy with back-up battery</td>
<td>up to 72 hours @ 1 hour reporting interval @ +23°C</td>
</tr>
</tbody>
</table>

## Satellite data communication

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Network</td>
<td>Iridium Satellite network</td>
</tr>
<tr>
<td>Satellites</td>
<td>Low earth orbit, total globe coverage, 66 satellites, mesh network</td>
</tr>
<tr>
<td>Frequency</td>
<td>1616 MHz to 1626,5 MHz</td>
</tr>
<tr>
<td>Average radiated power</td>
<td>&lt; 1W</td>
</tr>
<tr>
<td>Antenna</td>
<td>Integrated patch antenna, Iridium certified</td>
</tr>
</tbody>
</table>

## GSM/GPRS data communication

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supported Bands</td>
<td>Quad Band 850/900/1800/1900 MHz</td>
</tr>
<tr>
<td>SIM Card</td>
<td>Global SIM, supplied with the terminal</td>
</tr>
<tr>
<td>Data Features GPRS</td>
<td>Embedded TCP/IP and UDP/IP protocol stack</td>
</tr>
<tr>
<td></td>
<td>Embedded FTP</td>
</tr>
<tr>
<td></td>
<td>SSL - Secure Connection</td>
</tr>
<tr>
<td>Antenna</td>
<td>Integrated</td>
</tr>
</tbody>
</table>

## GPS/GLONASS positioning receiver

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Channels</td>
<td>33 tracking, 99 acquisition</td>
</tr>
<tr>
<td>Acquisition</td>
<td>Cold start 28 s, hot start &lt; 1 s, sensitivity -167 dBm @ tracking</td>
</tr>
<tr>
<td>Accuracy</td>
<td>5 m CEP</td>
</tr>
<tr>
<td>Antenna</td>
<td>Integrated patch antenna</td>
</tr>
</tbody>
</table>
Standards, certificates and approvals

- IEC 60945: Maritime electronic navigation and communication equipment and systems
- ISO 7367-2:2004: Electrical transients along supply lines
- ISO 16750-2: Environmental conditions and testing for electrical and electronic equipment - part two: electrical loads - load dump
- IEC60529 – IP68: Water and dust ingress protection
- CE 1304: European product safety CE mark
- ICE 60068-2-1: Low temperature functional test
- Iridium Compatible Equipment (ICE) certificate
- MIL-STD-810G: Operating temperature test

Local certificates for:
- Indonesia
- United Kingdom
- Norway
- and many more.
Please see the list on www.bluetraker.com

- ISO9001:2008: EMA Quality management system certificate

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