CELL2SEA MARITIME CELLULAR AND INTERNET ACCESS SOLUTION FOR CRUISE LINERS AND PASSENGERS FERRIES

Overview

UAB RIGMA provides turnkey on-board cellular communication solutions for cruise and ferry operators. Our solutions allow passengers and crewmembers to use their cell phones while on board of the ships, as well as have access to the Internet. Personal cell phones automatically switch to our on-board network when the ship enters into international waters, where the land-based cellular coverage is not available.

Our solutions enable cell phone coverage by linking the on-board network with public GSM networks through satellite backhaul. UAB Rigma and its partners operate mobile services via roaming agreements with cellular operators around the world, handling all legal and regulatory issues associated with its unique technology and service solutions.

We also provide for connections to land based public networks and international roaming support. By installing our on-board communications system, ferry operators gain significant competitive advantage, providing cellular connectivity to passengers and crewmembers through their personal cell phones.

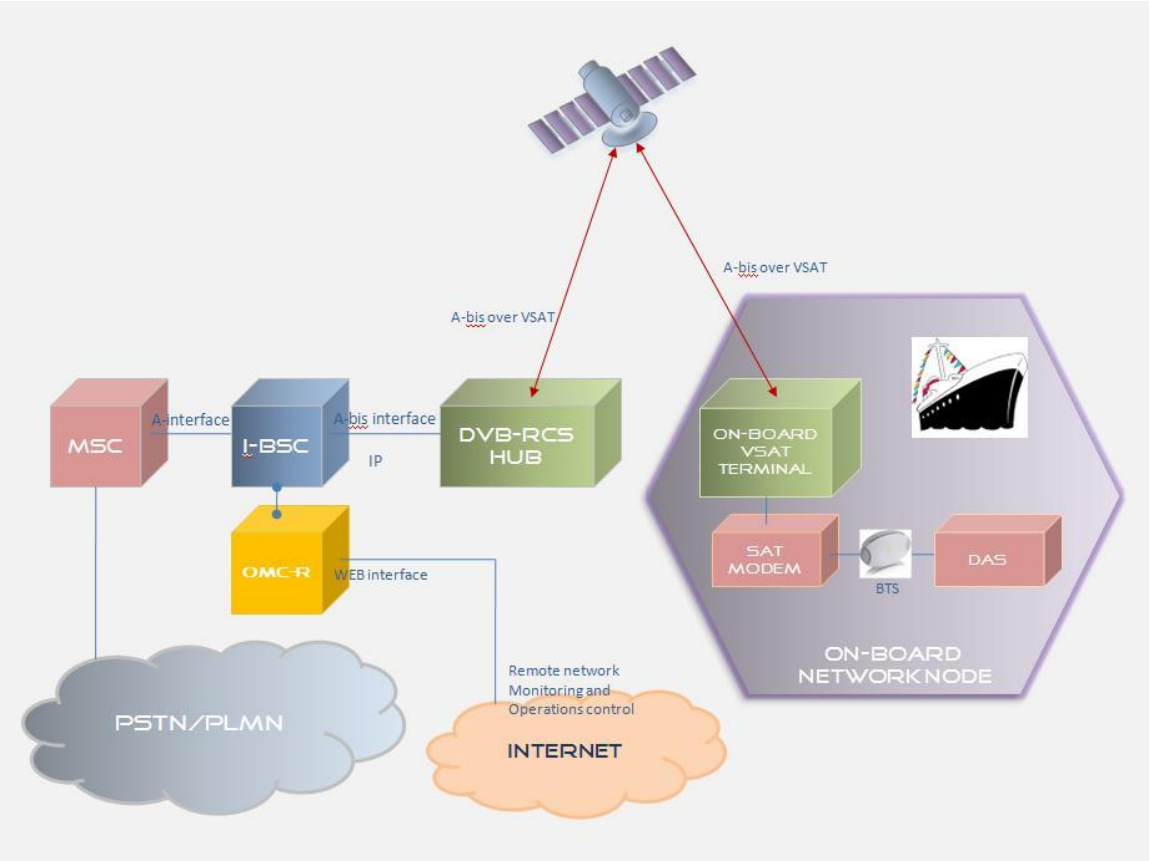
To enable cellular service at sea, our installations include radio GSM/CDMA equipment, a distributed antenna system (DAS) and satellite backhaul DVB-RCS equipment.

Principle of operations

General network topology is shown in the diagram below. A shipboard cellular system transmits signals via the satellite antenna located on the ship's superstructure. Once our service operator partner receives the cellular traffic, it routes each call to the user's home network roaming agreements with home carriers. From the antenna, the signal is ransmitted via coaxial cabling to a cellular nano base station (BTS) located in the ship's telecommunications room.

The cellular base station links the shipboard traffic with the service provider's network, similarly to the base stations used in a standard land-based cell tower. From the base station, the signal moves throughout the ship via the DAS.

Typically, we enable coverage in most public areas, in meeting rooms, passenger cabins, and the crew's quarters. The system receives and transmits signals in linear polarization mode from and to geosynchronous satellites at Ku-band. It includes two main sets of equipment: satellite set and GSM/CDMA set. It is important to note that our systems operate in asynchronous mode. This enables for highly efficient use of the bandwidth and provides higher channel capacity, this way guaranteeing Quality of Service to passengers and crew, as well as the possibility to offer add-on services like internet access



Benefits for operators

On-board cellular services provide passengers and crewmembers with additional convenience, comfort and safety. They also enhance the ship operator's revenues through either revenue-sharing agreements or lease payments by UAB Rigma .

In addition, the vessel's operator can benefit from a range of add-on services like:

- Internet access in public areas either via the internal LAN of the ship or wireless, by placing a number of Access Points in specific areas such as restaurants and lounges, and any relevant area where demand for this service is established.

- VPN connection with headquarters in order to feed live information about passengers, cars and trucks loaded, and to stream images from the ship's internal CCTV network. This information is automatically transferred to a central database, and can be updated and accessed at any time by both the crew and the operator at HQ's.

- Free internal calls via special 4 digits numbering plan for crew and free in-coming and out-going calls for the high responsibility officers of the vessel.

Our solutions finally include the possibility to manage a complete entertainment suit, from movies on demand to online casino games. We will also provide the client with bespoke tailor-made packages so that the content provision can satisfy all client needs.

Finally, on-board GSM networks can be a clear differentiator hence a unique selling point and marketing tool to promote the operator's transport services more effectively and eventually attract more customers.

Please note that we are able to provide the services on any routes covered by the ship operator, worldwide, thanks to our extensive network of satellite providers.

Benefits for passengers

On-board cellular coverage enables passengers to conduct business or stay in touch with their office, friends and family while they travel. They do not have to switch off their mobile devices anymore. Please note that our solutions provide for "two-ways" communication, passengers can enjoy both in-coming and out-going calls, as well as SMS service.

In addition, the whole travel experience becomes more comfortable and attractive by having the possibility to surf the net, to check their emails and do business while on the move, and finally by enjoying the wide on-board entertainment offering.

Business model

There are three parties to the business model characteristic of this project:

- The maritime network operator (UAB Rigma)
- The cruise / ferry operator
- The GSM operator.

Maritime network operator:

- At its own expense provides all necessary satellite and GSM equipment.
- At its own expense provides full turnkey solution, from project plan to installation of the systems and their interconnections with selected mobile operator.
- 24/7 monitors the system efficiency and quality and provides required maintenance.
- On a monthly or quarterly basis pays agreed fixed amount to cruise / ferry operator.
- Provides free on-board communication between members of the crew using standard mobile handsets.
- Looks after the legal aspects of the project, including negotiations with cellular land operators and all necessary documentation to apply for licenses and conduct project registrations.

Cruise ferry operator:

- Allows Maritime Network Operator to install and maintain on-board GSM network according to approved project plan and maintenance procedure.
- Assists Maritime network operator in distributing information on GSM service availability for passengers while traveling in international waters.

GSM cellular provide:

- Performs roaming information processing in order to generate TAP-files used for transactions with roaming partners, who provided their subscribers with international roaming services.

- Allows interconnecting the GSM nodes on ships to operator's switching facilities (interconnection between the Base Stations Controller and the Switching Center (MSC).

Interference issue

Our on-board GSM network automatically avoids interference with any nearby land-based networks. When the system sees another licensed terrestrial network with signal strength better than -100 dBm (threshold level), it switches off automatically. Once the ship moves out of the range of land mobile networks, the system turns on and becomes operational within 3-5 seconds. From the terrestrial network side, our onboard GSM network is seen as one transmitting signal at a level lower than -130 dBm, which can be considered as a simple noise level, therefore not causing any interference. Activation and shutdown of GSM on-board transmitting equipment is based on the measurement of nearby terrestrial GSM base stations power output. Our integrated automatic control unit responsible for this function includes a GSM radio modem (measurement of input power levels in scanning mode) and a software package used to analyze measurements results. In addition, none of the communications or electronic equipment located on-board of the vessel operates in standard GSM and CDMA frequency bands. This means that our equipment has no impact on the operations of the equipment already existing on-board. With very low RF output power, cellular network equipment is fully EMC-compatible with other electronic devices on-board.

Human health aspect

Operations of our on-board GSM/CDMA systems are based on the use of DAS (Distributed Antenna System). Signal output power strength for each DAS antenna is limited to 100 mW, which is an equivalent of +20 dBm. In other words, this is 2-3 times lower in comparison with the standard mobile handset output level. As a result, there is no negative impact of radio signals on human health. Satellite antenna operates in a very narrow beam at Ku-band, therefore, similarly to our GSM equipment, the power radiated by our satellite antennas have no impact on human health.