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ENABLING THE

# CONNECTED FARM





# BGAN M2M FARMING AUTOMATION

Tesacom and Inmarsat provide BGAN M2M communications and remote control capabilities to OXZO S.A. for fish farm oxygenation in Chile.

## COMPANY BACKGROUND

OXZO, part of the holding company Fiordo Austral S.A., is a Chilean business which specialises in providing oxygen and ozone solutions to the salmon farming industry. It has developed an innovative sea-based oxygen generation system called OxyMar®, which speeds up the cultivation of fish. OXZO currently has 21 OxyMar units and a total installed capacity of 180 tonnes of oxygen, making it the leading oxygen producer in the Chilean regions of Los Lagos and Aysén.

## THE CHALLENGE

Aquaculture is one of the fastest growing food industries in the world, due to a steady increase in the demand for fish and the continuing depletion of wild fish stocks. Salmon farmers are constantly looking for innovative ways to accelerate the growth of their stocks until they are ready for harvest, and a crucial means of doing so is ensuring that the sea cages, large nets attached to floating platforms anchored off-shore, have the optimal level of oxygen.

In order to provide oxygen to salmon producers' fattening units, OXZO developed specialist technology to monitor the level of oxygen in the water and distribute additional oxygen if required. However, as these platforms often miles out at sea, it is

critical that the oxygenation equipment can be operated and controlled remotely, making constant connectivity essential.

To address this connectivity challenge OXZO equipped platforms with VSAT satellite technology. However, the constant movement of the platforms due to swells in the ocean, which was 'pitching' the platforms, resulted in the VSAT antennas losing their connectivity, limiting OXZO's ability to control the levels of oxygen in the sea cages. Each time this happened, OXZO had to send technicians out to these platforms to realign the VSAT antennas - incurring significant costs in the process.



## KEY BENEFITS

1. Reliability: operates over the Inmarsat L-band global satellite and ground network, with 99.9% availability
2. Performance: standard IP at a rate of up to 448kbps with a low latency from 800 milliseconds
3. Easy to integrate: simple for field teams to set up, integrate and maintain without technical expertise or training
4. Cost effective: low-cost terminal, low data rate plans with no reconnection fees
5. Enhanced support: free firmware upgrade over-the-air
6. Easy to manage solution: remote terminal management, debugging and configuration options



## THE SOLUTION

In response to this problem, OXZO engaged Tesacom, a specialist in deploying integrated communication networks in remote and inhospitable environments, to develop a solution that used Inmarsat's global satellite network to deliver constant connectivity and reliable transmission of data from the floating platforms to the company's monitoring centre.

Viviana Fonseca, CEO at Tesacom, explains how the company worked in a consultative approach with Inmarsat to develop a satellite connectivity solution that could overcome OXZO's challenges: "We recognised that the communications issues caused by the remote and challenging location of off-shore sea cages meant that satellite was the only viable connectivity option. We needed a robust communications solution that could withstand the irregular movements of the sea and continue to transmit data to OXZO's control room. We opted to replace the

existing VSAT technology with a Hughes 9502 machine-to-machine integrated antenna terminal using Inmarsat's BGAN service.

"We chose the BGAN solution because it is ideal for supervisory control and data acquisition solutions that require point-to-point connections. Working with Inmarsat's L-band service, rather than the much narrower Ku-band frequency of the VSAT solution, gave us much greater flexibility and ensured constant connectivity to the platforms, regardless of where they are situated."

The BGAN terminals are more than capable of operating in this environment, with an IP66 rating that protects the technology from dust and water. Using Inmarsat's global satellite network, the terminals provide data connection speeds of 448 kbps upload and 464 kbps download and offer 99.9% availability. This ensures that OXZO can operate the oxygen distribution system remotely, regardless of the conditions.

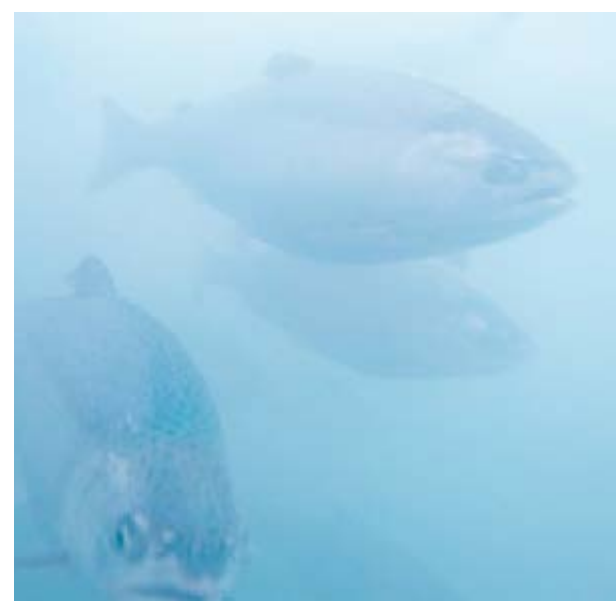
## THE RESULTS

The BGAN M2M solution enables communication between OXZO's control room and the oxygen generation equipment, enabling it to entirely automate the delivery of oxygen at its floating platforms. This ensures that the optimal level of oxygen is present in the cages at all times and speed up the fish cultivation process. This has enabled OXZO to significantly reduce its operational costs and become more productive, ensuring that provide the very best service to its clients.

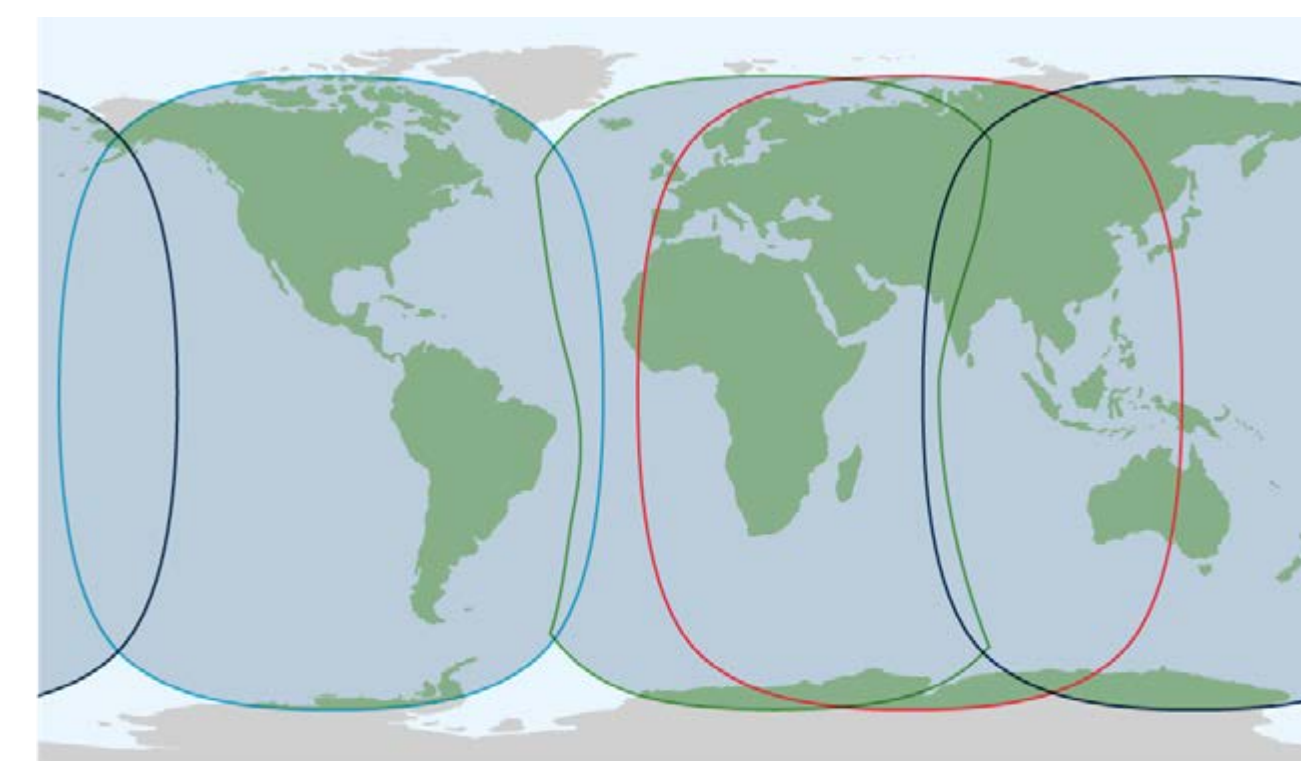
John Marcus, Manager at OXZO, commented: "We rely upon being in constant communication with our Oxymer® systems, which enables us to monitor and adjust oxygen levels in real time and control the systems remotely. With our previous VSAT system we did not have that functionality, due to the constant losses of connectivity. We were also incurring significant costs by having to send a maintenance technician out to our sites to realign the communications

infrastructure and restore connectivity manually. However, with the new BGAN solution, that has all changed and we've been enjoying seamless connectivity.

"The solution provided by Tesacom and Inmarsat has been hugely important in enabling us to deliver a better service to our clients, and we are rolling it out across all our Oxymer® oxygenation platforms."



## INMARSAT I-4 NETWORK COVERAGE



Combined I-4 and Alphasat coverage I-4 Americas  
Alphasat I-4 MEAS I-4 Asia-Pacific

This map depicts Inmarsat's expectations of coverage following the commercial introduction of Inmarsat's fourth L-band region. It does not represent a guarantee of service. The availability of service at the edge of coverage areas fluctuates depending on various conditions.





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