



wavecom

communications engineering



Case Study



Monitoring of
Ribeira da Madeira



Challenge

The flooding issue in Madeira has been frequent. The risk of fast and violent flooding due to the heavy rain and with the respective flow of solid materials, has caused several floods and one of the most severe occurred on 20 February 2010, resulting in dozens of deaths and several material damages.

LREC

The LREC – Laboratório Regional de Engenharia Civil is a body whose mission is to perform, coordinate and promote scientific research and technological development, as well as other scientific and technical operations necessary to the progress and to the best practice of civil engineer, operating mainly within the fields of construction and public works, housing and urbanism, environment, material industry, components and other products for construction and related field, focusing its business on the quality and safety of the works, the protection and reconstruction of natural and built heritage, as well as on the modernisation and technological innovation of the construction industry.

Objective

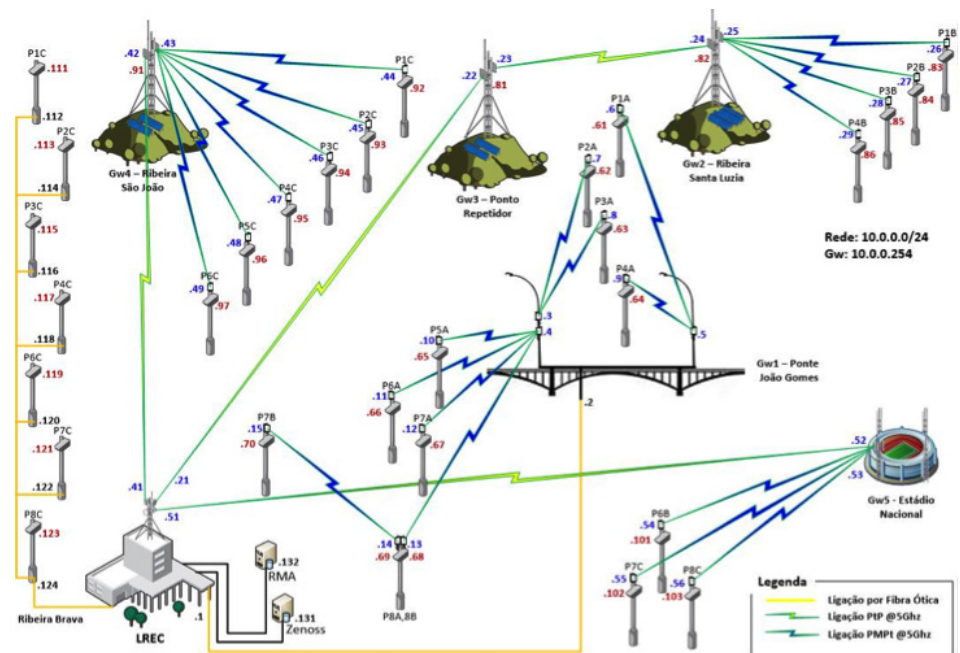
In order to prevent such floods, LREC intended to design an automatic system to monitor and examine the evolution of heavy rains, water level and water outlet from the creeks in Madeira Island - João Gomes, Santa Luzia and São João, in Funchal, and Ribeira Brava - in order to avoid flooding risks and, in case of risk, to be able to send warnings to the population, informing them of the flooding risk in a specific location, enhancing thus the safety of the population.

“The LREC intended to design an automatic system to monitor and analyse heavy rains, water level and water outlet of the Madeira island’s creeks”

“...a Wavecom designed and implemented an automatic Telemetry and Surveillance system, in 4 creeks of the Madeira Island that enables real time monitoring of the streams and materials that flow in them.”

The solution

With a view to comply with the proposed challenge, Wavecom designed and implemented an automatic Telemetry and Surveillance system, in 4 creeks of the Madeira Island that enables real time monitoring of the streams and materials that flow in them.



High level network diagram

The monitoring is made with video surveillance cameras in different sections throughout the creeks and using other type of equipment, such as radar and ultrasonic sensors, seismograph and geophones, among other, that are placed at the headboards of the water basin to register rainfall.

In some remote places, where there is no power, it was necessary to implement photovoltaic systems to feed the installed equipment.

"The monitoring is made with video surveillance cameras in different sections throughout the creeks"



P4B



P3B



P2B



P1B

“Implement a network which is dedicated, autonomous and free from any telecommunication service, using wireless connections in unlicensed band.”

Operational challenge

- Implement a network which is dedicated, autonomous and free from any telecommunication service, using wireless connections in unlicensed band.
- Design an integrated and centralised monitoring system on LREC to monitor the 4 creeks;
- Monitoring 24h/day with video cameras placed on crucial sections at the creeks and solid material retention structures;
- Send the collected data to LREC through an implemented wireless connection;
- Design a robust solution with energy backed up by crucial locations;
- Extreme weather conditions in some places (altitude, snow, wind, fog, solar radiation and high temperatures during Summer);
- Installation and access problems;
- Reduced installation time.

“The project is being praised and well accepted by many people, including European Commissioners and the Investment European Bank, during their visit to evaluate the project for financing purposes.”

Implementation

- Installation of 38 Wavesys 1000 radios, creating 26 wireless connections in unlicensed band
- Wireless connections in more than 10 km long
- Band width of 100 Mbps
- Minimum availability of the connections of 99,99%
- Implementation of 32 surveillance cameras, eight per each four of the creeks
- More than 400h of engineering and installation
- Total installation time was less than 2 weeks
- More than 20 air travels between the continent and Madeira Island
- More than 2 tonnes of installed material

Customer observations

“The project is being praised and well accepted by many people, including European Commissioners and the Investment European Bank, during their visit to evaluate the project for financing purposes.” I believe this is very positive for the future, the continuity and the growth of the mounted system”... “I would like to thank, on behalf LREC, the commitment and professionalism of the entire team of Wavecom that was involved in our project...”

Paulo França, Director of LREC



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About Wavecom:

Created in 2000, Wavecom is an Engineering company with a strong Integration and Development component, with a solution portfolio in Wireless and Unified Communication Networks.

Wavecom is characterised by a sound experience, versatility and competence in the design and implementation of systems and applications that are completed, integrated and adapted to each customer's needs.

Knowledge and experience acquired throughout the years, due to the number and complexity of the implemented projects, strengthens the multidisciplinary experience of our technical team, which represents the differentiating value of Wavecom in the market.



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