rapiersystems
We Live Wireless!

Case Study: European Marine Energy Centre (EMEC)

EMEC ORKNEY
THE EUROPEAN MARINE ENERGY CENTRE LTD

EMEC had a requirement to collect real-time data from devices attached to the sea bed within their ocean test range to enable proper evaluation of wave and tidal renewable energy equipment being tested. This data needed to be received in real time and then sent on to the relevant organisations that were ultimately responsible for the equipment. The issue for EMEC was that the devices were tethered to a stationary buoy approximately 6 Km from the shore line in Orkney.

EMEC had attempted to pilot a similar system previously, having purchased 'off the shelf' equipment; however the system was not capable of sustaining a connection for any period of time and was prone to equipment failure due to the harsh sea environment. This led to the customer becoming concerned that communications of this nature might not even be possible – at least not reliably.

Upon discussing the requirement with the customer, we checked the link was achievable using our desktop analysis software in order to ensure no ground obstacles would prevent LOS and to predict the throughput a link could achieve. We then designed a system that would be capable of not only surviving the harsh marine environment, but would also keep a connection in the tidal conditions. The main challenge was to get a system that would perform in the harsh conditions and keep transmitting, whilst allowing for rotational alignment changes due to the tidal flows rotating the axial position of the buoy, as well as vertical changes in antenna alignment due to the swell of the ocean.

Once we had selected the appropriate equipment and antenna types, we set about demonstrating the system to show the rotational and vertical degrees of freedom the solution would cope with while still maintaining communications. This showed that the system could cope with all but the heaviest sea conditions while still maintaining a wireless connection and once the freedom of rotation and pitch was shown to be magnitudes greater than those that the buoy would normally achieve, the system was signed off for deployment.

The system was installed at the ground station and buoy in January 2013 and the customer has reported to us that in 6 months of use, there have been only minor interruptions with no failures. Since the installation there have been many challenging weather events, but the customer reports that they are extremely happy with the solution – indeed they are looking to replicate it at another test facility nearby. More importantly, their faith in wireless communications has been restored.

Established in 2003, The European Marine Energy Centre (EMEC) Ltd is the first and only centre of its kind in the world to provide developers of both wave and tidal energy converters – technologies that generate electricity by harnessing the power of waves and tidal streams – with purpose-built, accredited open-sea testing facilities.

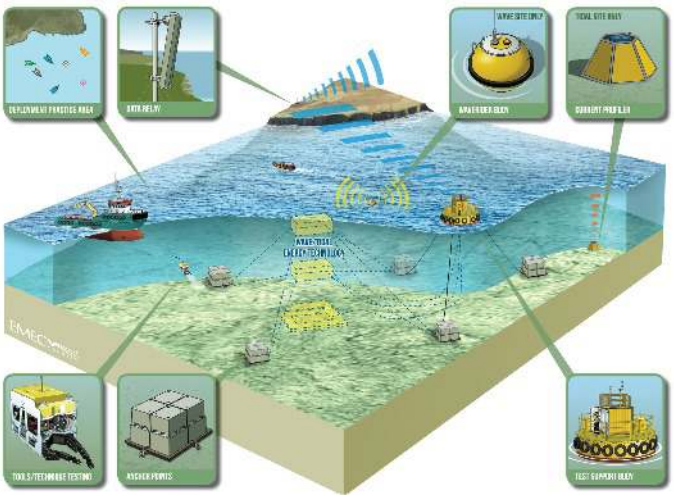
Orkney is an ideal base for EMEC with its excellent oceanic wave regime, strong tidal currents, grid connection, sheltered harbour facilities and the renewable, maritime and environmental expertise that exists within the local community.

With 14 full-scale test berths, there have been more grid-connected marine energy converters deployed at EMEC than any other single site in the world, with developers attracted from around the globe. These developers use the facilities to prove what is achievable in some of the harshest marine environments, while in close proximity to sheltered waters and harbours.

EMEC also operate two scale test sites where smaller scale devices, or those at an earlier stage in their development, can gain real sea experience in less challenging conditions than those experienced at the full-scale wave and tidal test sites.

Beyond device testing, EMEC provide independently-verified performance assessments, a wide range of consultancy and research services, and are working closely with Marine Scotland to streamline the consenting process.

EMEC are at the forefront in the development of international standards having coordinated the development of a suite of 12 industry guidelines, six of which are being progressed for global adoption as the first international standards for marine energy.



"Getting reliable real-time information from these devices was very important to us and our clients and the solution designed and installed by Rapier Systems allows us to get it"

Graham Bleakley Tech IOSH, Operations Manager
The European Marine Energy Centre (EMEC) Limited

rapiersystems
We Live Wireless!

Case Study: European Marine Energy Centre (EMEC)

About Rapier Systems

Formed in 2003 Rapier has unrivalled expertise in the design, delivery and support of wireless (including WiFi) networks and systems; the company is a value added integrator of best-in-class wireless products.

Whether within or between buildings, upgrading or replacing existing networks, or designing and installing new wireless systems, Rapier's experience in environmental analysis and network design ensures complete coverage and optimal performance.

Rapier works with world leading wireless system vendors, including Ruckus, Alvarion, Airtight, Cambium/Motorola, Ceragon, SAF Technika and several more. The company has reached the highest level of accreditation with each of its partners and understands which vendor and product is best suited for each environment.

Rapier has grown dramatically on the back of a surge in demand for wireless networks, which it has designed and installed in a wide variety of challenging environments from colleges and oil rigs to business parks and theatres.

Rapier maintains Scotland's largest Wireless Network, covering Dundee City, Angus and Perth & Kinross Councils, which comprises around 250 sites.

The company has designed and delivered some of the most innovative wireless solutions in the UK, including the largest metropolitan area wireless network in Scotland and one of the largest county-wide wireless networks in England. Rapier delivered the 1st fully licensed Gigabit wireless link in the UK.

The company's headquarters is located in Fife, Scotland and it has offices in St Neots, Cambridgeshire, England.

Rapier has a UK wide customer base in sectors that include Local Government; Transport, Renewables, Oil and Gas, Retail and Leisure.

For further information please visit **www.rapiersystems.com**

Rapier Systems Limited
Ore Valley Business Centre, 93 Main Street, Lochgelly, Fife, KY5 9AF
Tel: 0845 299 6171 E: info@rapiersystems.com W: www.rapiersystems.com

Registered in England - Registration No 4821724