



## Wireless Technology

**Commercial and domestic domains have, over the past few years, seen a rapid growth in the replacement of physical cabling by RF “wireless” connections.**

The European Space Agency (ESA) has been active in addressing the potential applications through working groups and studies of these new technologies and protocols. It is timely to consider how space mission development and test can benefit from the ‘spin-in’ from industrial wireless developments. The wireless field is diverse in respect of application, protocols and technologies and informed choices need to be made when determining the best approach to meet a range of needs in a high integrity environment such as space; such choices should be based on a thorough understanding of the technology and direct practical experience.



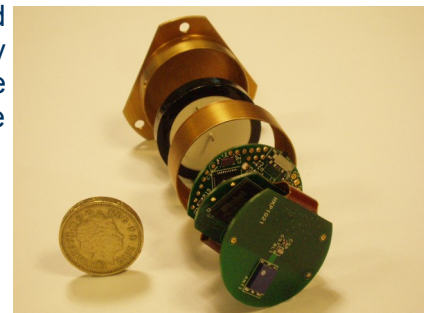
*LPPNS sensor module*

In addition to completing several study activities wireless systems have been developed through a partnership with AgustaWestland to place wireless sensor networks onto helicopters for structural monitoring during flight.

SEA is undertaking a study for the European Space Agency into the applications of wireless technology for use in spacecraft, launcher and planetary applications. For this project SEA is leading a European team including EADS Astrium SAS, Swedish Space Corporation and 4Links.

The SEA-developed low power proximity sensor network (LPPSN) has been successfully demonstrated in a spacecraft mock-up at EADS-Astrium in Toulouse and is undergoing more tests in the Ariane 5 booster nose-cone. The system includes a network controller and a number of battery powered sensor devices. The aim was to demonstrate how the technology could be used to monitor vibration and temperature of the launch vehicle during launch. This application needs the maximum bandwidth of the system as well as minimum latency and testing has provided useful data leading to improvements to the system.

The SEA team in Bristol developed the IEEE 802.15.4 based modules and will next be tackling the demonstration for planetary applications. In addition a new, even smaller module, based on the same technology, is being built specifically for temperature monitoring during spacecraft integration testing.



*New temperature sensor module*