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Application of UWB wireless MIMO connectivity inside ships (Conference Paper)

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Abstract

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In this paper, Ultra wideband (UWB) technology is proposed for replacing the large amounts of wiring used in ships which can cause serious problems like electrical interference, short circuit fires and similar trouble. There are numerous applications of Wireless Sensor Networks (WSNs) like in target tracking, monitoring a large number of sensors at vital points with actuators, controllers etc. However there are not many studies which focus on implementing this technology in Ships. Wireless communications can be difficult in ships due to many metallic structures. The proposed UWB technology is based on novel pulse shapes which are derived from mono cycle sine waves in the GHz range, which have been practically tested and found to comply with the FCC regulations, in terms of power levels and spectral mask limitations. The technique can be operated as a high bit rate fast digital personal area network (PAN). The results obtained practically show that this wireless solution may provide cost-effective alternative to the huge amount of wiring and cables, which are used to interconnect sensors and peripheral devices to central digital control units. The proposed scheme has been analyzed theoretically and implemented practically as well as by simulations. © 2014 IEEE.

Author keywords

Connectivity Gb Pulses MIMO On board Ships UWB wireless communication within ships

Indexed keywords

Engineering controlled terms: Communication channels (information theory) Cost effectiveness Digital control systems Digital devices MIMO systems Personal communication systems Ships Target tracking Wireless sensor networks Wireless telecommunication systems

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