Abstract

This paper presents a new hybrid wireless communication structure that use both optical and RF communication to avoid traffic collision problem happened in normal wireless communication. The new communication protocol can be used to create a wireless communication with large number nodes. According to strictly scheduled wireless transmission, each wireless node transmit packets in a unique time slot, the wireless collision could be completely avoided. To show its performance and possible application, we implemented the wireless communication to DPS that is often used in factories. The result of the experiments for DPS illustrated that the new hybrid communication could provide good performance on both real-time property and reliability, besides, the DPS could achieve the similar performance of typical wire system. With more improvement on the hybrid system implementation, the new hybrid communication system may be expected to be widely applied in industrial field.

References
1. A Andreas, C T Mattias - Sweden, ZigBee: a suitable base for embedded wireless development?, Chamers University of Technology, 2005
2. Koubaa, C A. Alves, C M. Tovar, GTS allocation analysis in IEEE 802.15.4 for real-time wireless sensor networks, Parallel and Distributed Processing Symposium, 2006
3. As-Interface, www.as-interface.net

**Index Terms**

Computer Science \hspace{2cm} Wireless

**Keywords**

Optical communication, RF communication, Wireless communication, Traffic Collision