

RFID three-level based integral tracking system for non-homogeneous loads

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Abstract

Tracking of products in production and distribution lines is something required by manufacturers, retailers, customers, and also the authorities. Manufacturers usually control the quality of their production within their facilities. However, products inside the pallets are mixed together at the distribution centers, and non-homogeneous loads are achieved by the combination of different products. This practice is called "*picking process*". Even nowadays, picking is still considered the weakest point of the distribution chain, not only due to its complexity but also to the resources involved in it. The errors made during the transportation phase involve additional costs and inconveniences and supposes an important drawback for distribution companies. To solve the lack of competitiveness created by this inconvenience, an auto-managed three-level based RFID system is proposed in this paper in order to provide an efficient solution for the non-homogeneous loads problem. The solution has been implemented by means of RFID passive and active tags, and wirelessly communicated readers in items, pallets and containers, constituting the three levels of the distribution chain. In the container level, a wireless network connecting all the readers based on ZigBee technology has been implemented. This network is also connected to a GPRS system. Thereby, a real-time worldwide communication is also possible. In addition, another advantage of the proposed system is its ability to provide real-time localization of products (RTLS) all over the world.