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Identification and Localization of Transport Units for Selected Company

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Abstract

Smart identification by automatic identification technologies currently plays an important role in all areas of the national economy. Article deals with research in field of automatic identification by selected components (signal front lights, pallet and containers) through radio-frequency identification technology (RFID) in conjunction with automotive industry. The aim of our research was to identify all RFID identifiers placed on selected components and to localize position signal front lights, which was stored on pallet. It also talks about software support for RFID technology, mainly about creation and configuration of RFID middleware – specialized software tool allowing mutual communication between two or several applications; also known as connector between various application components. All results had been measured in laboratory and also real condition. A special section is dedicated to description of the technical equipment used during measurements and concept of measurements in conjunction with localization as well as their results from MySQL database.

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1. Introduction

A Smart identification by automatic identification technologies currently plays an important role in all areas of the national economy. In terms of optimization of logistic processes, barcode technology is used. However, radio

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frequency identification technology brings lot of advantages to the table, therefore it is expected that its involvement will significantly expand into all areas of the national economy. The article focuses on research of RFID technology in the process of smart identification of selected floodlights through RFID technology. It also talks about software support for RFID technology, mainly about creation and configuration of RFID middleware – specialized software tool allowing mutual communication between two or several applications; also known as connector between various application components. The article talks about RFID technology as well as about the completed study of readability of RFID identifiers placed on floodlight. A special section is dedicated to description of the technical equipment used during measurements and concept of measurements in conjunction with localization as well as their results from MySQL database.

2. About RFID technology

RFID technology is complex, combining a number of different computing and communications technologies to achieve desired objectives. Each object which has to be identified is fitted with a small object called a RFID tag stuck to it (Dávid, 2013).

Each RFID tag has a unique identifier that enables additional information about each object to be stored. Devices known as RFID readers wirelessly communicate with RFID tags, with a view to identifying the attached RFID tags, as well as enabling information stored in the RFID label to be read and updated (Vojtěch and Neruda, 2010).

Every RFID system contains an RF subsystem (Fig. 1), and most RFID systems also contain an enterprise subsystem. An RFID system supporting a supply chain is a common example of an RFID system with an inter-enterprise. In a supply chain application, a tagged product is tracked throughout its life cycle, from manufacture to final purchase, and sometimes even afterwards (e.g., to support service agreements or specialized user applications). Radio frequency identification is a wireless data collection technology that uses electronic tags which store data, and tag readers which remotely retrieve data (Madleňák *et al.*, 2016). It is a method of identifying objects and transferring information about the object's status via radio frequency waves to a host database. RFID represents a significant technological advancement in AIDC because it offers advantages that are not available in other AIDC systems such as barcodes. RFID offers these advantages because it relies on radio frequencies to transmit information rather than light, which is required for optical AIDC technologies (Beneš *et al.*, 2013).

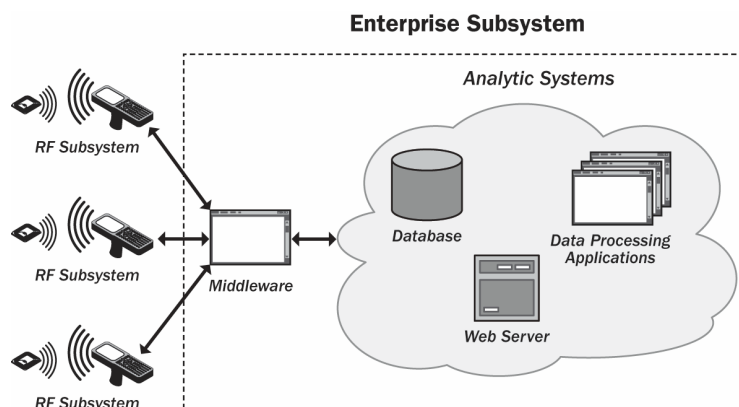


Fig. 1. RFID system.

There are three basic components of RFID system, RFID tags, RFID readers and middleware, which is responsible for all data transaction in the system (Madleňák *et al.*, 2015).

An RFID tag is a small device that can be attached to an item, case, roll cage, or pallet, so it can be identified and tracked. It is also called a transponder. The tag is composed of microchip and antenna. These elements are attached to a material called a substrate in order to create an inlay (Bindzar *et al.*, 2010).

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