СЕКЦІЯ 3. ТЕХНОЛОГІЯ ТА АВТОМАТИЗОВАНЕ ПРОЕКТУВАННЯ В МАШИНОБУДУВАННІ

RFID AND INDUSTRY 4.0: CHALLENGES AND OPPORTUNITIES

Alieksieiev V.[1,2], Demchenko E.[2], Zub O.[2], Sydorenko V.[2], Kovalenko V.[2]
[1]Leibniz University Hannover, Hannover, Germany
[2]National Technical University "Kharkiv Polytechnic Institute", Kharkiv

The term "Industry 4.0" was firstly public presented during the Hannover Messe, one of the biggest trade fairs in the world, by the promoter group of the research union Economic-Science (German: Wirtschaft-Wissenschaft) [1]. This term describes the implementation of intelligent and digital systems and technologies (e.g. Internet of Things, Artificial Intelligence, Big Data etc.) in all human areas of activity with the purpose to assist people processing the big information and data volumes. In the context of logistical implementations of Industry 4.0 it is usual to speak about a term "Logistics 4.0". It describes the application of intelligent automation and data processing systems especially in logistical application, such as warehousing, transport technologies, production logistics, etc (cf. also [1]).

Due to increasing complexity of logistic and production systems, companies are forced to look for technical solutions, which enable them to establish an effective control of material flows, to increase the turnover and to minimize the logistic costs. Especially the items identification process, as a binding element between different members of the supply chain, plays an important role. One of the possible technical solutions for an effective identification of items is the Radio Frequency Identification (RFID) technology. This technology is based on the radio frequency data transmission between a transponder (chip), which is located on the item or items package, and reader, which can be located on distance up to 100 m from the chip (in special cases) [2, 512]. The information from the chip is read by the reader and can be transmitted e.g. to the computer for further processing. In comparison to the second frequently used identification technology - barcode identification technology – RFID has following important advantages: it is contactless, which can also be relevant e.g. in time of pandemic, enables to scan several items per moment, at a significantly bigger distance. In addition to this, the transponder (chip) can be located inside of the package, which can protect it from the damage, and can be rewritten.

As possible difficulties in the implementation of RFID in production and logistic processes and future research fields can be e.g. costs reduction for implementation and maintenance of RFID-systems, transmission stability under the influence of liquids of metals as well as reduction of logistic costs using the RFID-technology.

Sources:
1. Bousonville, T. Logistik 4.0, Springer Fachmedien Wiesbaden, 2017.
2. Martin, H. Transport- und Lagerlogistik, Springer Fachmedien Wiesbaden, 2014.