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Wydział Automatyki, Elektroniki
i Informatyki

ANALIZA METOD IMPLEMENTACJI SIECI
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RZECZY

MGR INŻ. IRENEUSZ SMOŁKA

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Prof. dr. hab. inż. Andrzeja Kwietnia

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ABSTRACT

ANALYSIS OF PROGRAMMABLE NETWORK IMPLEMENTATION METHODS IN INDUSTRIAL COMPUTER SYSTEMS USING THE INDUSTRIAL INTERNET OF THINGS

M.SC. ENG. IRENEUSZ SMOLKA

The paper presents methods of implementing software-defined networks in decentralized industrial systems. In the first stage, the researched subject was familiarized with and the possibilities of possible application of programmable computer networks were checked. The main assumption was to introduce devices to the network infrastructure that would allow for dynamic network management while ensuring optimal communication parameters for the industrial process. An additional assumption was the use of embedded devices to perform control functions, i.e. work as a controller of software-defined networks. In order to analyze the possibility of implementing the assumptions, a research model was prepared, as well as a model of the control system (the part responsible for communication). In accordance with the determined dependencies, a scenario of research was proposed, which was carried out with the use of equipment commonly used in control systems, as well as popular industrial network protocols. The obtained results are presented and discussed in the following parts of the paper. Based on the capabilities of the available hardware, it was possible to run software-defined networks and identify problems that may arise when they are used. The conducted research was based on checking the time needed to perform tasks by programmable network switches and whether this time is short enough for the control system to work properly. In the last chapters, apart from the summary, the proposed solution was compared with others available on the market. This made it possible to draw attention to similar problems regarding each of the approaches. After modifying the network, there is an additional SDN network controller in the infrastructure, which can be both a separate device, but also a network service (virtual device). In order to select the appropriate controller, an analysis and comparison of the available options was performed. The whole work consists of an analysis of the problem, a theoretical introduction and an introduction to the discussed topic, an introduction to

the research part (development of a research model and description of research), presentation and analysis of the results obtained and a final summary.