THESIS REVIEWER'S REPORT

I. IDENTIFICATION DATA

Thesis title:	**IO-Link OPC UA Integration for Siemens SIMATIC**
Author's name:	**Rustambek Bekmukhamedov**
Type of thesis :	master
Faculty/Institute:	Faculty of Electrical Engineering (FEE)
Department:	Department of Microelectronics
Thesis reviewer:	Ing. Lukáš Kvarda
Reviewer's department:	Siemens, s.r.o. Siemens Advanta Development.

II. EVALUATION OF INDIVIDUAL CRITERIA

Assignment	**ordinarily challenging**

How demanding was the assigned project?

The aim of the thesis of Rustambek Bekmukhamedov was integration the part of the standard for OPC UA into the IO-Link Siemens Simatic system. In the theoretical part of the work, the author gradually occupies the basic principles of OPC UA and IO-Link technology. The practical part deals with the implementation of OPC UA interface to IO-Link technology.

Fulfilment of assignment	**fulfilled with major objections**

How well does the thesis fulfil the assigned task? Have the primary goals been achieved? Which assigned tasks have been incompletely covered, and which parts of the thesis are overextended? Justify your answer.

The original task was integration the OPC UA into IO-Link Siemens HW, that was not fulfilled, due the COVID-19 restrictions. The alternative Raspberry PI solution is missing some major parts. I would like to see more real IO-Link device simulation, GPIO control and final analysis of solution. Overall the work is conceived as implementation guide.

Methodology	**partially applicable**

Comment on the correctness of the approach and/or the solution methods.

The author works well with documentation. His approach more or less met the requirements of the task he had.
The theoretical part is quite extensive, but due to the assignment it is acceptable.

Technical level	**D - satisfactory.**

Is the thesis technically sound? How well did the student employ expertise in the field of his/her field of study? Does the student explain clearly what he/she has done?

The author combined his gained knowledge about OPC UA and IO-Link technology into a practical solution. However, the work is missing some analysis of solution, for example program size, memory usage, performance with and without security features, etc.

Formal and language level, scope of thesis	**C - good.**

Are formalisms and notations used properly? Is the thesis organized in a logical way? Is the thesis sufficiently extensive? Is the thesis well-presented? Is the language clear and understandable? Is the English satisfactory?

The work is written clearly. Chapter 3 is still theoretical overview, therefore chapter 2 would be better place for it. Language level of the work is average. Some figures could have a better image resolution. I do also miss headers and footers. The author should have thought about using some diploma thesis template.

Selection of sources, citation correctness	**D - satisfactory.**

Does the thesis make adequate reference to earlier work on the topic? Was the selection of sources adequate? Is the student's original work clearly distinguished from earlier work in the field? Do the bibliographic citations meet the standards?

The format of Bibliography citations do not follow the standards. Precise link to specification is missing (namely first three links refers only to https://io-link.com). Source 5 and 6 are not cited in text.

Additional commentary and evaluation (optional)
Comment on the overall quality of the thesis, its novelty and its impact on the field, its strengths and weaknesses, the utility of the solution that is presented, the theoretical/formal level, the student's skillfulness, etc.
Student prepared OPC UA server for Raspberry PI, this work provided an insight about integration of IO-Link with OPC UA, which will help with further porting the implementation to a real hardware (IO-Link Master), from which Siemens Master will benefit.

III. OVERALL EVALUATION, QUESTIONS FOR THE PRESENTATION AND DEFENSE OF THE THESIS, SUGGESTED GRADE

Summarize your opinion on the thesis and explain your final grading. Pose questions that should be answered during the presentation and defense of the student's work.

The presented work would be very interesting if implement to a real industry hardware, it is a pity that the COVID situation did not allow it.

The grade that I award for the thesis is **D - satisfactory.**

Date: **24.1.2021**   Signature: