

I. IDENTIFICATION DATA

Thesis name:	Emulation of SmartWire-DT communication protocol using a standard microcontroller unit
Author's name:	Emin Tunahan Yazan
Type of thesis :	master
Faculty/Institute:	Faculty of Electrical Engineering (FEE)
Department:	Open Informatics - Computer Engineering
Thesis reviewer:	Pavel Dedourek
Reviewer's department:	Eaton European Innovation Center, ICPD

II. EVALUATION OF INDIVIDUAL CRITERIA

Assignment	challenging
<i>Evaluation of thesis difficulty of assignment.</i>	
Topic of this diploma thesis was challenging due to the fact that SmartWire-DT communication protocol is proprietary and normally implemented by ASIC (Application Specific Integrated Circuit) which provides specific peripherals which are not present by standard production microcontroller.	

Satisfaction of assignment	fulfilled
<i>Assess that handed thesis meets assignment. Present points of assignment that fell short or were extended. Try to assess importance, impact or cause of each shortcoming.</i>	
Student went through all steps without compromising. He learnt how SmartWire-DT proprietary protocol works, he suggested and developed system (hw + sw) to be able to emulate on SWD device by using standard microcontroller instead of normally used ASIC (Application Specific Integrated Circuit) which is used in common SWD devices. He did not implement all features which are implemented in standard product, but this was out of scope of this thesis.	

Method of conception	correct
<i>Assess that student has chosen correct approach or solution methods.</i>	
Student implemented all important low layers by standard microcontroller to properly achieved main functionality of SWD protocol.	

Technical level	A - excellent.
<i>Assess level of thesis specialty, use of knowledge gained by study and by expert literature, use of sources and data gained by experience.</i>	
Student showed that he is able to accept the challenge during work on proprietary industrial protocol which SmartWire and properly emulate protocol which is normally implemented in ASIC. He used low level techniques which makes source code faster but not really readable. This is not problem, because code is really good documented by finite state diagram description where state names are the same as in source code.	

Formal and language level, scope of thesis	A - excellent.
<i>Assess correctness of usage of formal notation. Assess typographical and language arrangement of thesis.</i>	
Final thesis was written by understandable technical language. It follows description from top to bottom. Introduction to each subsection in first section makes diploma thesis very well structured and it is easy to follow what author wanted to explain. When author did some decision, he explain why he did such decision and compare it with other different solutions.	

Selection of sources, citation correctness	A - excellent.
<i>Present your opinion to student's activity when obtaining and using study materials for thesis creation. Characterize selection of sources. Assess that student used all relevant sources. Verify that all used elements are correctly distinguished</i>	

from own results and thoughts. Assess that citation ethics has not been breached and that all bibliographic citations are complete and in accordance with citation convention and standards.

Author had not easy task to do during gathering information about proprietary industrial SWD bus, because it is not open and no detailed information are available for public. He used all possible documents written by external company to get knowledge how this protocol works. It is possible to distinguish what is his part and what he reused. The bibliographic citation meets the internationally accepted standards.

Additional commentary and evaluation

Present your opinion to achieved primary goals of thesis, e.g. level of theoretical results, level and functionality of technical or software conception, publication performance, experimental dexterity etc.

Please insert your commentary (voluntary evaluation).

III. OVERALL EVALUATION, QUESTIONS FOR DEFENSE, CLASSIFICATION SUGGESTION

Student showed responsible approach. He started from the point where he studied SmartWire protocol by making running small setup with SmartWire devices. Trying to understand and explain himself how does it work by writing documentation. The description of protocol is written in better way than original document. He used better protocol diagram where you can see how does it work.

Implementation on microcontroller is done in really low level way where I missed some level of abstraction. This was caused mainly by the fact that protocol itself is huge and it was out of scope of this diploma thesis to implement all layers and functions like original device.

At the end of this thesis, there is part, which describes how the final implementation was tested and what constraints need to be fulfilled to be able to use such code on microcontroller. This comparison is going to help next developer with development of full stack emulation.

I evaluate handed thesis with classification grade **A - excellent**.

Date: **28.8.2020**

Signature: