**Practicum 4: Interrupts and DMA**

**Group number:**

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| --- | --- | --- |
| **Name** | **Student ID** | **Email** |
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*We use this template to demonstrate the minimal requirements for the report. Please follow the same structure, but individual formatting is permitted. Using LaTeX is of course allowed as well. However, we only require a PDF document. Remove the italic text before submission of the report.*

# **Theory Questions**

*Answer the questions below in your own words, add diagrams, formulas, and calculations if necessary*

1. **What is DMA? How does it work?**
2. **What are the differences between Interrupt and DMA mode?**

# **Task A: Blink an LED with External Interrupts**

## **Implementation:**

*Describe your solution. Add all relevant code snippets into a listing or as screenshots and describe their purpose. Remember to use generic methods with well-defined parameters!!*

## **Discussion:**

*Describe your experiences (e.g., design decisions, problems, lesson learned). Which part of the code will be reusable?*

# **Task B: Blink an LED using Non-Blocking DMA and Timer Interrupts**

## **Implementation:**

*Describe your solution. Add all relevant code snippets into a listing or as screenshots and describe their purpose.**Remember to use generic methods with well-defined parameters!!*

## **Results:**

*Add a screenshot of the UART output. Based on this screenshot, describe the functionality of your implementation.*

## **Discussion:**

*Describe your experiences (e.g., design decisions, problems, lesson learned). Which part of the code will be reusable?*

# **Task C: Read Magnetic Data from LIS3MDL Sensor in Non-Blocking Mode using Interrupts**

## **Implementation:**

*Describe your solution. Add all relevant code snippets into a listing or as screenshots and describe their purpose.**Remember to use generic methods with well-defined parameters!!*

## **Results:**

*Add a screenshot of the UART output.*

## **Discussion:**

*Describe your experiences (e.g., design decisions, problems, lesson learned). Which part of the code will be reusable?*

*What are the differences to your implementation in Practicum 3? Compare the implementations! What are the advantages and disadvantages?*

# **Task D: Read Magnetic Data from LIS3MDL Sensor in Non-Blocking Mode using DMA**

## **Implementation:**

*Describe your solution. Add all relevant code snippets into a listing or as screenshots and describe their purpose.**Remember to use generic methods with well-defined parameters!!*

## **Discussion:**

*Describe your experiences. Does your solution have any limitations? How would an ideal solution behave in your opinion? How is this task different from Task C?*