

SRS I2C

System Requirements Specification



Status: Draft

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1 Purpose

All elements of this project are parts of a course for the professional development of embedded systems. This Embedded Systems Engineering course is intended to develop a broad interdisciplinary understanding and knowledge of the participants as well as to develop practical skills for the realization of embedded systems.

The hardware platform for this course is the mySTM32 Board lite. It has a microcontroller of the STM32 family and all required input and output devices or add-ons.

2 Overall description of the task

Develop a microcontroller application in which an I²C temperature sensor is read out and the current temperature is sent to the PC via UART.

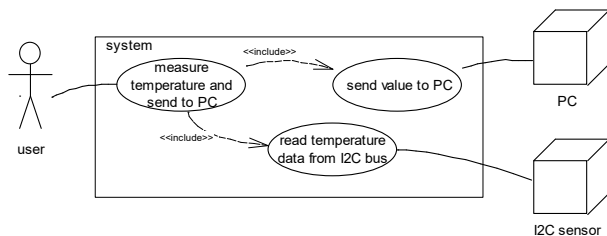


figure 1: uc: I2C tasks, user's perspective

List of top level requirements:

- system: measure temperature and send to PC
- system: read temperature data from I2C bus
- system: send value to PC

3 Functional requirements

After the system has been switched on, the UART connection is established. As long as the system is switched on, the temperature is recorded and sent to the PC and visualized.

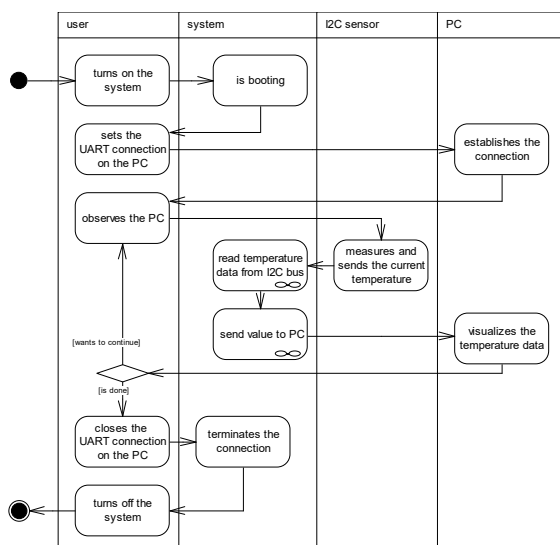


figure 2: measure temperature and send to PC



4 Hardware requirements

The hardware platform for this course is the mySTM32 Board lite. It has a microcontroller of the STM32 family and all required input and output devices or add-ons.

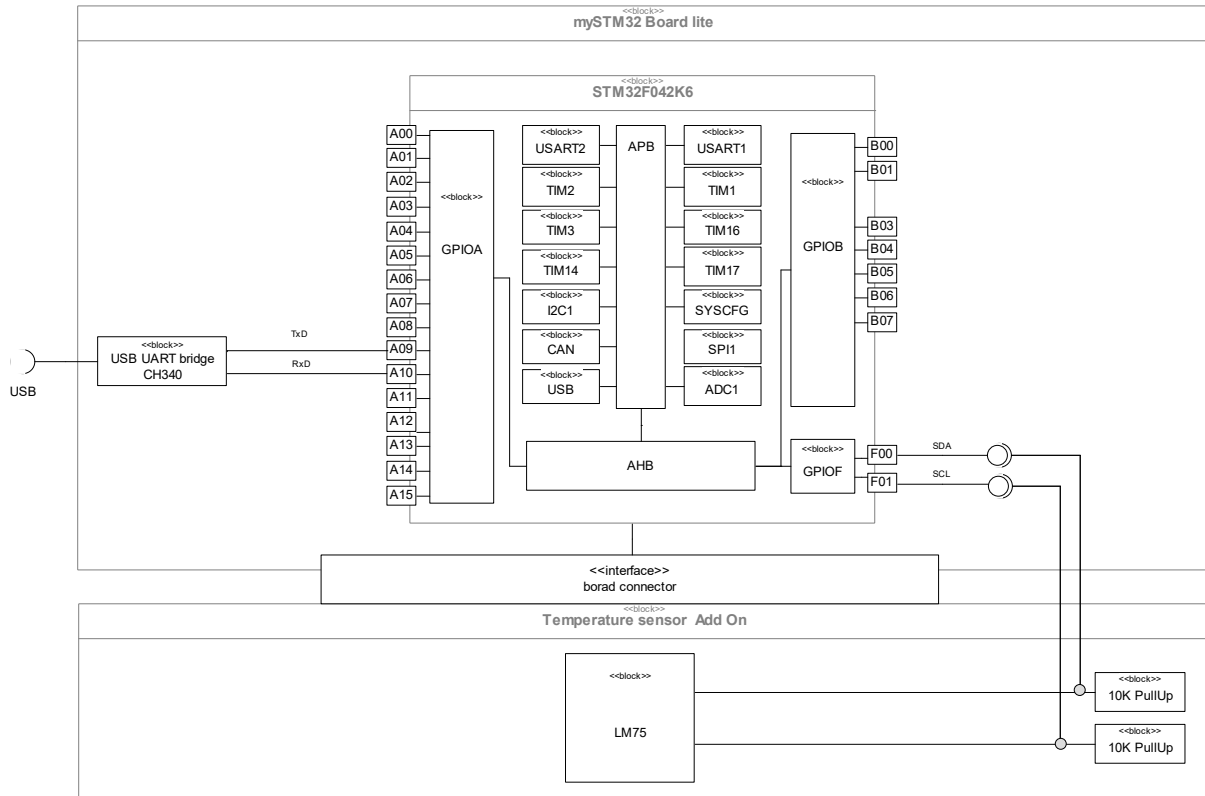


figure 3: I2C HRM

- connected USB
- connected Board connector : LED Add On
- connected pinF0 : SDA : PullUp
- connected pinF1 : SCL : PullUp

5 Process requirements

A software process is the defined sequence of activities, the agreed rules, techniques, tools and the expected results of the activities for the production of software. Defined software processes ensure the plannability, controllability and quality of results in the manufacture of software. The following simple software process is agreed as a binding workflow for this course.

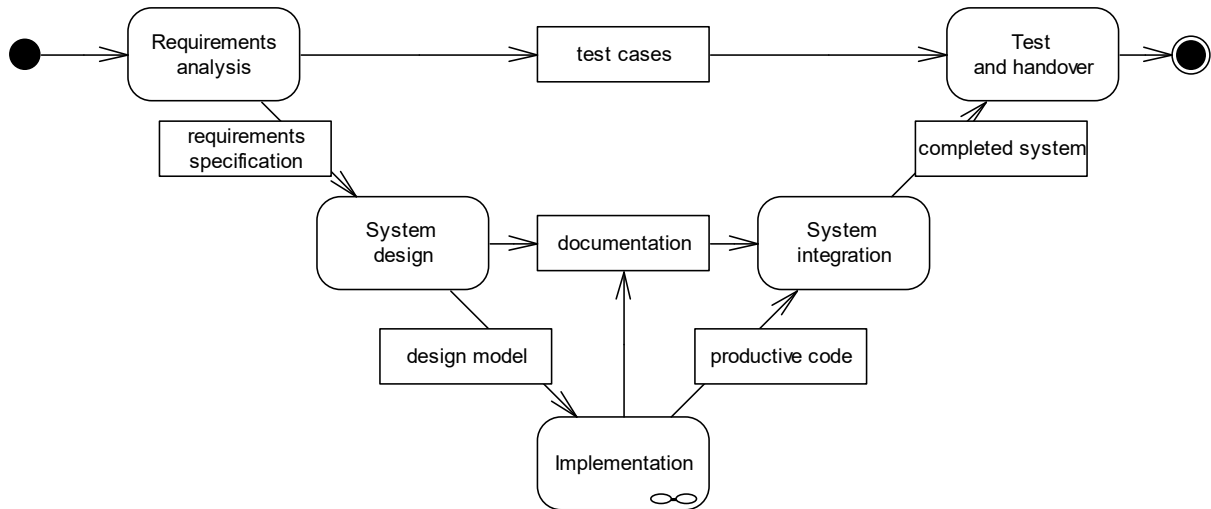


figure 4: act: lightweight model driven embedded software process

table 1: lightweight model driven embedded software process

Activity	Expected results
Requirements analysis	<ul style="list-style-type: none"> - User's perspective as use case diagram (as SysML / UML model) - required functionalities as activity diagrams (as SysML / UML model) - Test cases (as a document) - HRM hardware resource model (as SysML model) - SRS System Requirements Specification (as a document)
System design	<ul style="list-style-type: none"> - Class model of the concept level / architecture model (as UML model) - if necessary, state model (as UML model) - System documentation (as a document)
Implementation	<ul style="list-style-type: none"> - Class model of the realization (as UML model) - Behavioral models of the realization (as UML model) - Productive code (as a transferable format of the target platform, * .hex, * .elf) - System documentation (as a document)
System integration	<ul style="list-style-type: none"> - hardware software integration - the completed system
Test and handover	<ul style="list-style-type: none"> - the tested system - the technical system documentation (as a document) - the user documentation (as a document)



6 Attachment

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