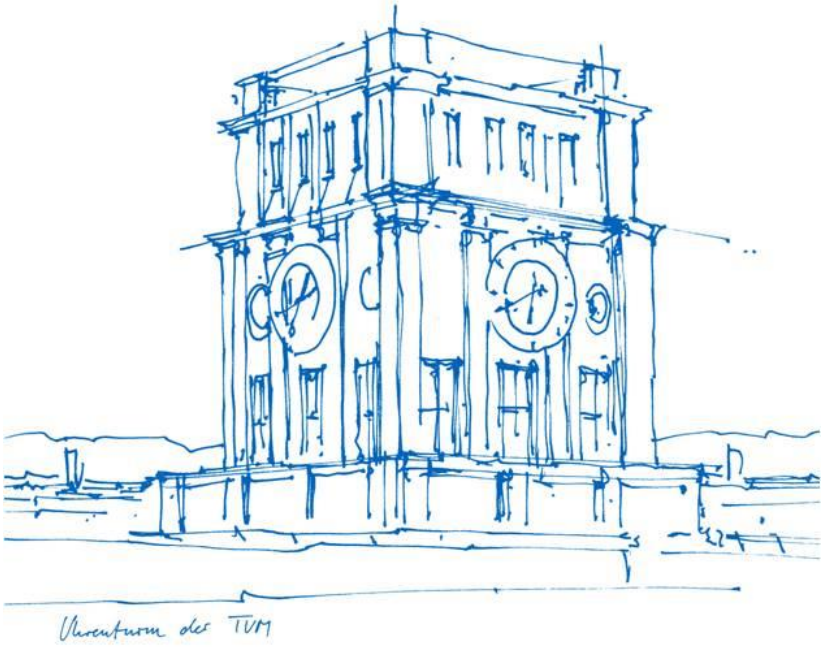
MW2411: Concepts and Software Design for Cyber Physical Systems

Technical University of Munich

TUM School of Engineering and Design

Chair of Cyber-Physical Systems in Production Engineering

Winter Semester 2025



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Lab0: Introduction

Lab Organization

- Laboratory projects:
  - There will be **6 assignments** during the semester
  - Submission via Moodle

- Weekly session alternate between Q&A and **review meetings**
- All labs are in U150, basement of the MW/ME building

- 4 lab sessions per date (you must be registered for one, see next slide):
  - Session 1: 10:00 am - 11:30 pm
  - Session 2: 1:00 pm - 2:30 pm
  - Session 3: 2:30 pm - 4:00 pm
  - Session 4: 4:00 pm - 5:30 pm

- Contact your TAs for questions by e-mail:
  - Ashutosh Pradhan: ashutosh.pradhan@tum.de
  - Binqi Sun: binqi.sun@tum.de
  - Bohua Zou: bohua.zou@tum.de

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Lan Schedule *

Week	Date	Content
1	16.10.2025	Lab00 Introduction / Lab01 Start
2	23.10.2025	Lab01 Q&A
3	30.10.2025	**Lab01 Review /** Lab02 Start
4	06.11.2025	Lab02 Q&A
5	13.11.2025	**Lab02 Review** / Lab03 Start
6	20.11.2025	Lab03 Q&A
7	27.11.2025	**Lab03 Review** / Lab04 Start
~~8~~	~~04.12.2025~~	Dies Academicus
9	11.12.2025	Lab04 Q&A
10	18.12.2025	**Lab04 Review** / Lab05 Start
11	08.01.2026	Lab05 Q&A
12	15.01.2026	**Lab05 Review** / Lab06 Start
13	22.01.2026	Lab06 Q&A
14	29.01.2026	Lab06 Q&A
15	05.02.2026	**Lab06 Review**
	18.02.2026	**Final Exam**

* Subject to change

Lab Work

- Assignments must be submitted on Moodle when they are due (the night before the review meeting) as a .zip-file

- Work on the assignments in groups → **form teams with 3 students now and join a group on Moodle!**

- When you find your team members, please inform us about your team

- You can get ~24/7 (please refer to TUM restrictions) access to the lab room → we need the number on your student ID card
  - Please use the provided material in a respectful manner
  - It is strictly forbidden to take material (PC, embedded boards, etc.) out of the lab room

Lab Computers

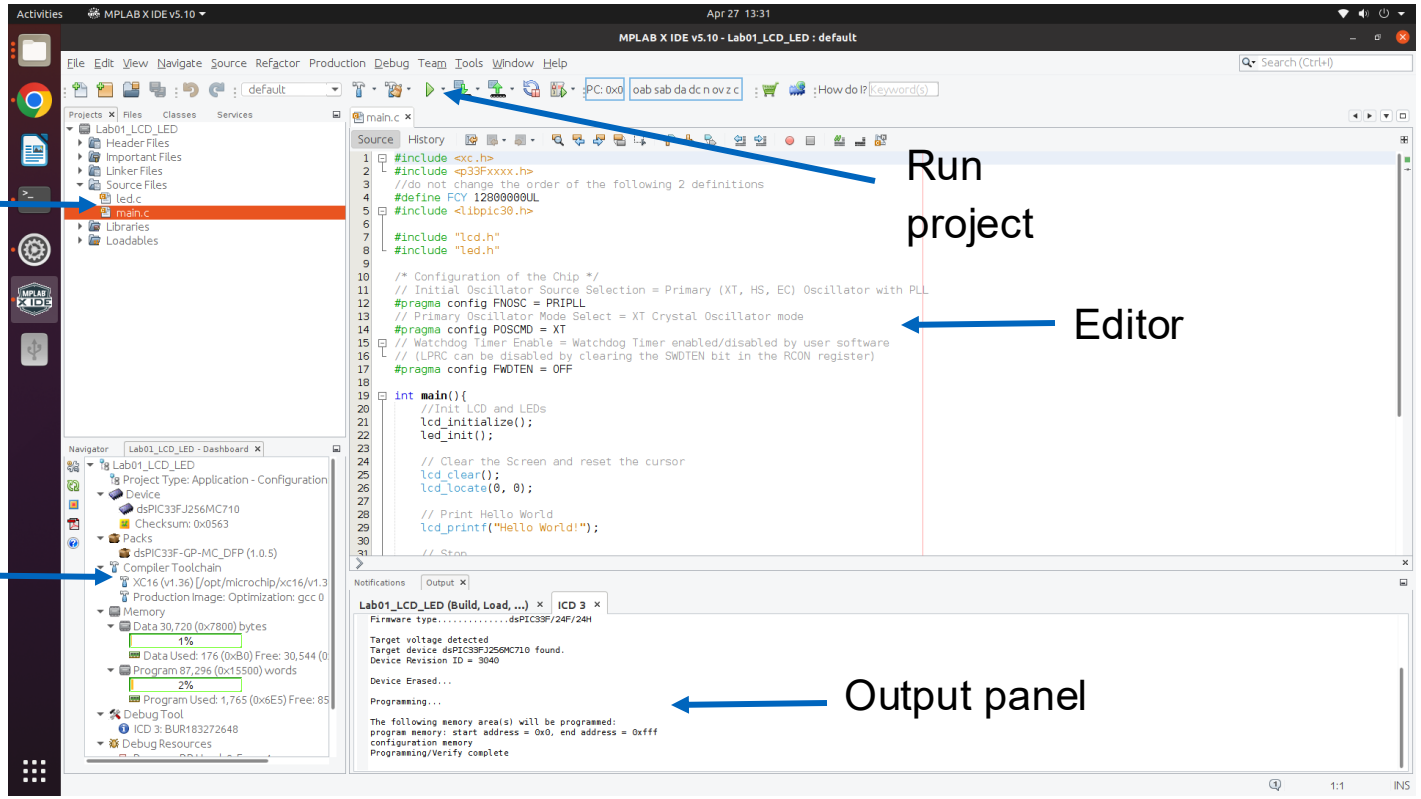
- The computers in the lab run on **Linux (ubuntu18.04)**
- If you need additional software, you can ask us to install it
- We have already created your accounts → we will give you your login credentials depending on your group number
- No file sharing between computers, we recommend to use a (online) distributed version control system as **git** or copy your files on a USB drive

Lab Manual

- Please download the lab manual from Moodle
- It provides all the necessary information about the lab work
- Additional information can be found in the reference documents, they are also uploaded to Moodle
- A detailed description of the board layout and its components is given in the lab manual

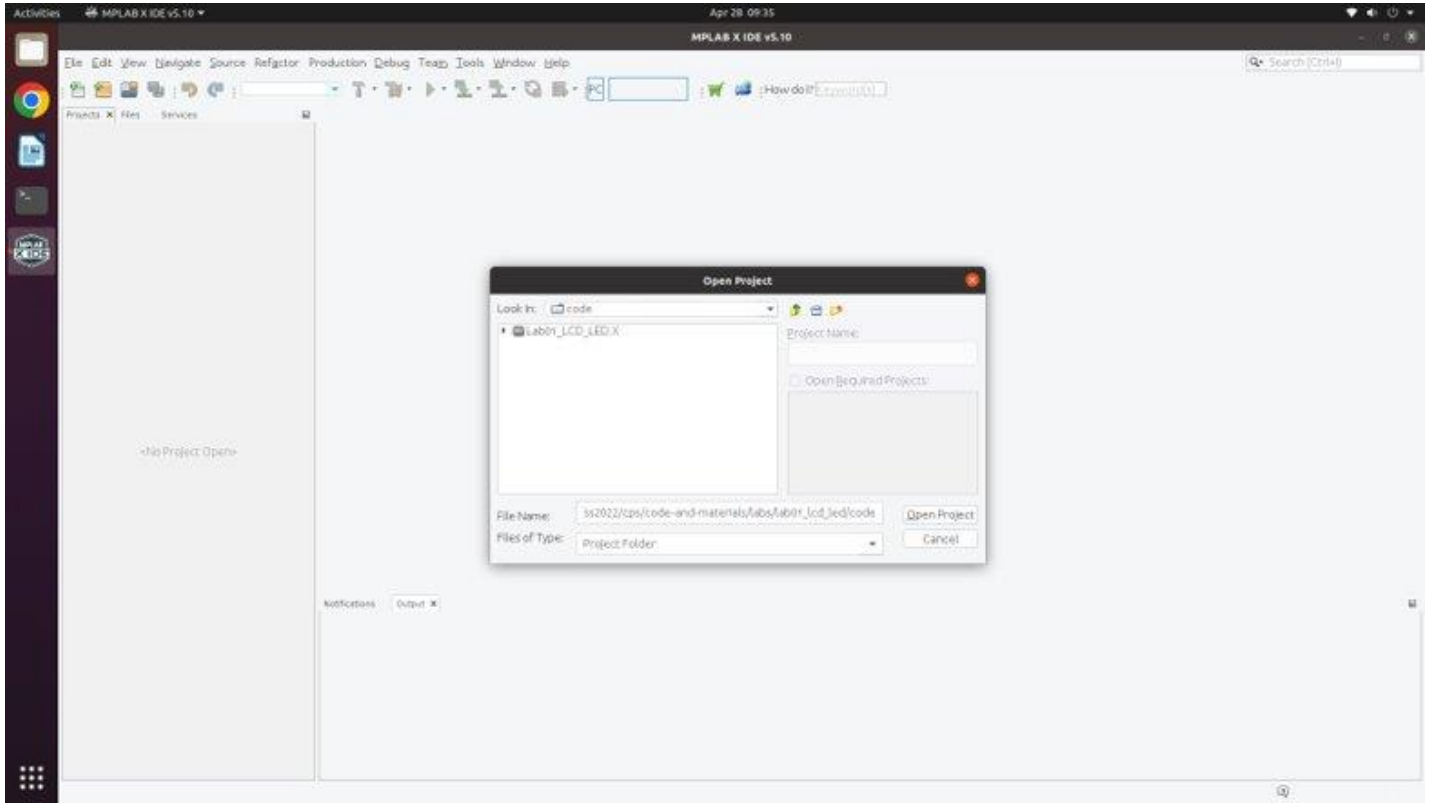
Programmer and IDE

- To program the embedded system in our lab, we need a programmer (device to write machine code to the embedded board) → MPLAB is used as IDE
- We will provide MPLAB projects that can be directly used by you



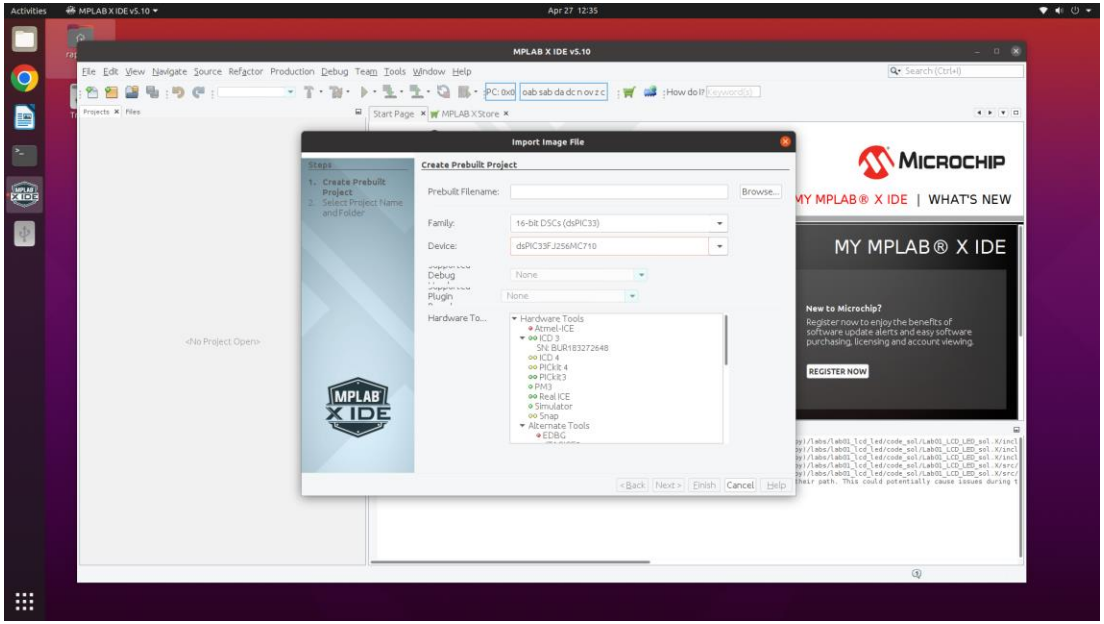
Important Commands: Import Project

1. Go to: **File** > **Open Project**
2. Select the correct project (has an .X ending) and click on **Open Project**



Important Commands: Import .hex-File

1. Go **File** > **Import** > **Hex/ELF… (Prebuilt) File**
2. Select the **Prebuilt Filename**
3. Very important: Select the correct **Device** of type: **dsPIC33FJ256MC710**
4. If it cannot be found **in Recently Used**, go to **Family** and select **16-bit DSCs(dsPIC33)** and then look for the correct type as given above
5. Select the object below **ICD 3** for **Hardware To…**, this is your programmer



Important Commands: Import .hex-File

6. Select **Use project location as the project folder** and **Finish**