5. Meeting

Modernisation HKR UNILAC
- Potiboard-

M. Stein

17/05/2024

New Potiboard? (1)

◆ The (old) potiboard in production
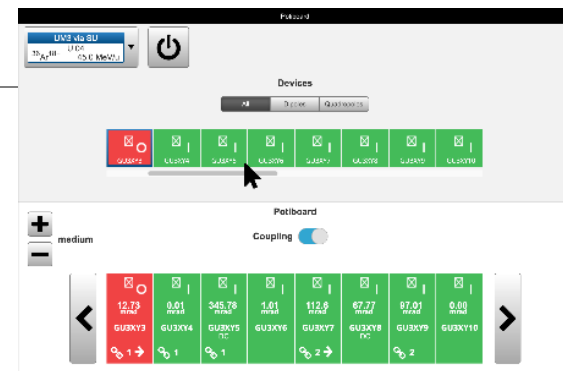
◆ Development of a new rotary encoder device connecting to a GUI application to manually adjust magnet properties for beam optimisation.

◆ The system shell focus on UNILAC operation.

◆ The project includes the rotary encoder device and the GUI application.

Potiboard-Encoder-Device

USB

PotiboardApp Application

Project Reorganisation

- End of September 2023 the decision was taken to divide the 'Potiboard project' into two sub-projects:

  - **Potiboard-Encoder-Device**
    The group *Hardware and Electronics (HEL)* from ACO will develop, build and maintain the potiboard encoder devices.

    Volker Kleipa is the sub-project lead.

  - **PotiboardApp Application**
    The main development of the application is outsourced. This sub-project is under supervision of the group *Applications (APP)* of ACO.

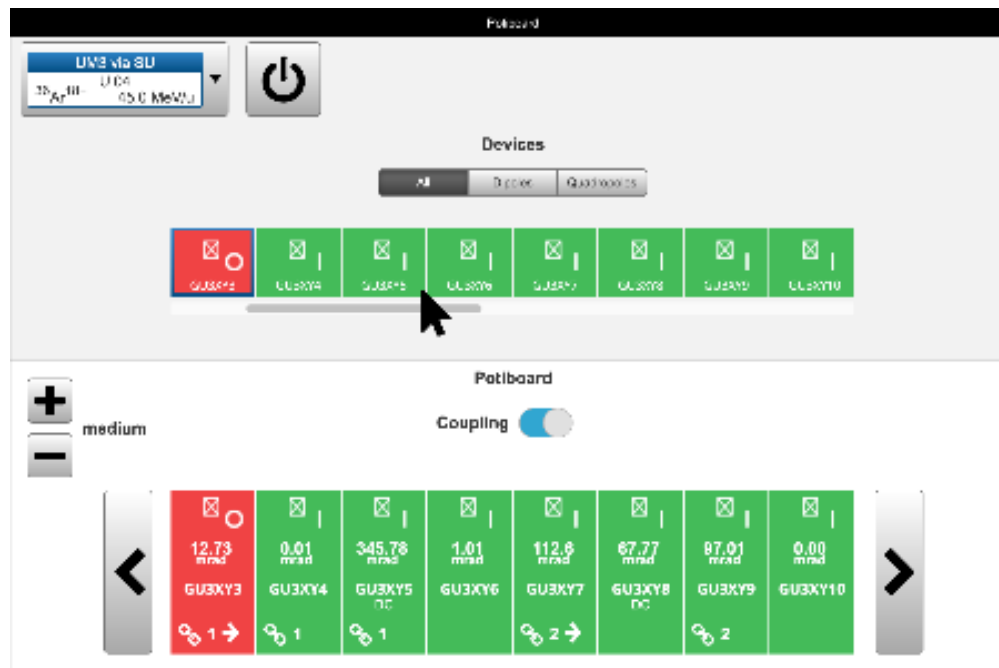   Jutta Fitzek and Christian Hillbricht (both of group *APP*) are the coordinators.

    Arthur Halama of the group *Application Support (APS)* of ACC is **Product Owner**.

Sub-projects' coordination

◆ Sub-projects communicate and regular meetings are held. The set of requirements necessary for the Emergency System was discussed and planned together (contract).

◆ *Operations* provide help in and out of meetings by Arthur Halama (PO), Martin Stein (PM) and operators.

◆ Functional and Integration Tests are planned together, e.g. a *test encoder device* will be provided by Volker Kleipa to facilitate the outsourced development of the *PotiboardApp Application*.
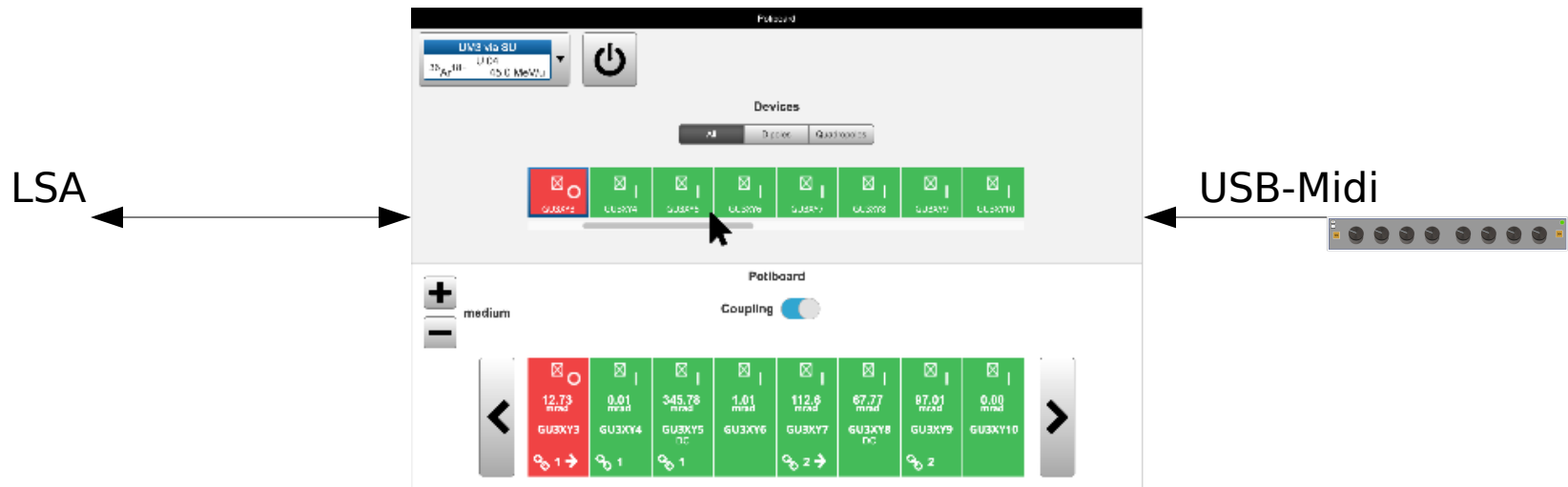
Status of sub-project PotiboardApp Application (1)

- The specification focusing on the Emergency System Milestone was made available to the outsourced partner.
- The development has started and several implementation goals have already been reached.
- Mockup:

◆ Work on the interfaces to external components has started:

LSA ← → (Potiboard application screenshot) ← USB-Midi

LSA support is given by the LSA team (*APP*),

USB-Midi support by the *APS* group

Status of sub-project Potiboard-Encoder-Device

- Microprocessor STM32 was evaluated and chosen
- Three STM32 boards of tye Nucleo-F439ZI were aquired
- USB-Midi C library for STM32 was tested and adapted to the needs
- First MIDI-data packages were sent to a PC and read out with Python code
- Package with STM32 Nucleo-F439ZI board and a optical rotary encoder has been prepared and is ready to be send to the external partner developing the *PotiboardApp Application*
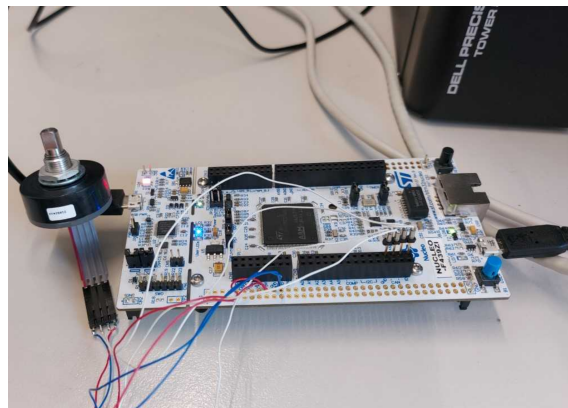
Milestone Emergency System (1)

Compulsary lists of requirements (uncomplete):

◆ PotiboardApp Application:

   ❖ Context Selection Widget

   ❖ Pictogram-View (horizontal row) of all magnets in chain (for selection)

   ❖ Filter function

   ❖ Second horizontal row with icon list representing selected magnets

   ❖ A Left and Right Button to change (selected magnets) on beam line

   ❖ Two Buttons to decrease/increase Increment

   ❖ Sleep Button (block all input)

   ❖ Coupling Switch (Master Mode)

Milestone Emergency System (2)

Milestone Emergency System (3)

Compulsary lists of requirements (uncomplete):

◆ Potiboard-Encoder-Device:

❖ Two equal devices should be ready for Emergency System

❖ Total of 8 rotary encoders should be in one line

❖ A light should indicate the connection status

❖ A Left and Right Button to change (selected magnets) on beam line

❖ Two Buttons to decrease/increase Increment

3. Potiboard Project Plan of Emergency System

	Description	Comment	Date
1.	Review	Status and Planning	17th-21th June
2.	Functional and Integration Test	Dry-Run July 2024	15th-19th July
3.	Review	Status and Planning	Begin of Sept.
4.	Review	Status and Planning	Begin of Oct.
5.	Functional and Integration Test for Emergency System	Dry-Run October 2024	$22^{nd} - 25^{th}$ October
6.	Meeting für weiteres Vorgehen Richtung Vollausbau		Nov. 2024
7.	Fertigstellung funktionsfähiges Vollausbau-Potiboard	Zur Strahlzeit	Q2 2026

Test during Dry-Run July 2024

◆ Functional Test

   ◈ Connect *Potiboard-Encoder-Device* to one of the HKR Unilac console PC with (Rocky Linux)

   ◈ Discover the *Potiboard-Encoder-Device* on the HKR Unilac console PC in the *PotiboardApp Application*

   ◈ etc.

◆ Integration Test

   ◈ Set Unilac magnets of different tyes (MU, MS, QT, QQ) from the *PotiboardApp Application* with LSA

   ◈ Set Unilac magnets from the *Potiboard-Encoder-Device* via the *PotiboardApp Application*

Unilac-Console
PC USB-Midi

LSA