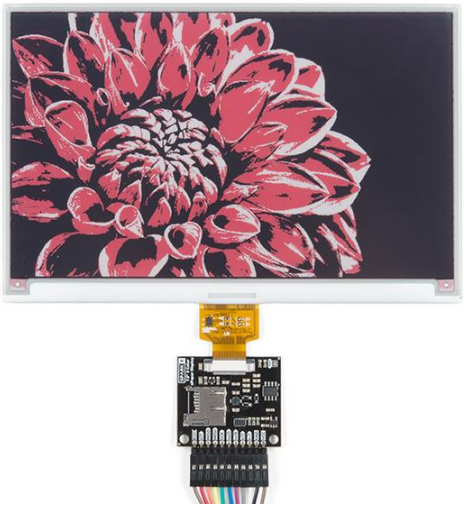
Subject 1: Eink room reservation display

Goal:

The goal of the project is to create a proof of concept for visualising room availability using a wi-fi module and an Eink display. The display only needs power to change the picture. When the device is shut down, the picture will stay on the display. The module will get the room its availability and occupation. More details will be displayed as well, e.g. the subject, teacher, class, start & stop time… The data is received from an online database with (fictive) data, using the wi-fi module to connect to the database.

Equipment:



- 1x Mbed FRDM-K64F
- 1x K64F Application shield
- 1x K64F Click shield
- 1x ESP-WROOM-02 Click
- 1x Eink Click + small display
- 1x Eink big display
- 1x USB-A to Micro-USB cable

Guidelines:

- Try controlling the Eink display. First write a library for the small Eink display (colors = white, grey1, grey2, black). The code is available online.
- Try controlling the bigger Eink display, get figures and text on it.
- Set-up a database online with fictive room availability data.
- Set-up the wifi module to connect to the database. Use a REST API, Node Express, Ruby On Rail…
- Display the data on the display and update every hour. Be sure that the data updates when the values in the database are changed.
- Adjust the firmware so that the system works as low-power as possible.
- If the data cannot be extracted using wi-fi and the internet, use the USB to get it from an external program from the PC.
- Extra: create an extra module so that every can be battery powered.

Notes:

- The ESP8266 can be configured and communicated with using “AT commands”.
- The ESP8266 can also be configured to use the non-OS SDK, being able to connect to a WPA2-Enterprise network.
- The Eink display communicates via SPI.