Embedded Systems

NXP

University Course

Course Contents

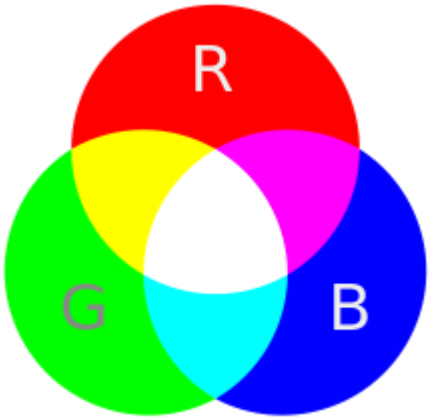
General topics, **Courses** & **Labs**

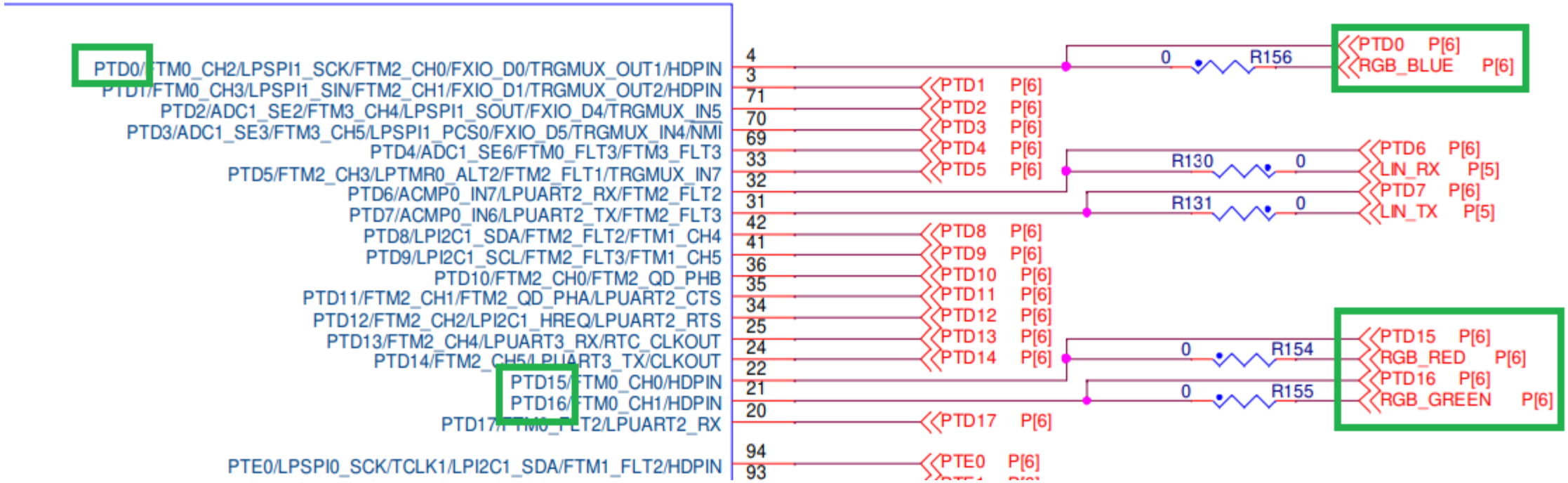
1. General Presentation of the Course
2. V-Model, Requirements Engineering, Process | Understand and Create Requirements
3. Process | Git, IDE Setup, Compile and Flash the Hello World Project
4. Architecture (UML) | Virtual Machine Environment Setup
5. How Hardware and Software are Linked | From Compiling to Electrical Signals and Debugging
6. RGB | Hands-on Lab (no module – just the dev board)
7. Node 1: Brake
8. Node 2: Lights
9. Review and Exercises

Notes and sources

Exercise: RED-YELLOW-BLUE

- The initial demo project will make the RGB LED to blink rapidly RED and GREEN colors
- Scope of this exercise is to make the RGB LED to blink on RED, YELLOW and BLUE

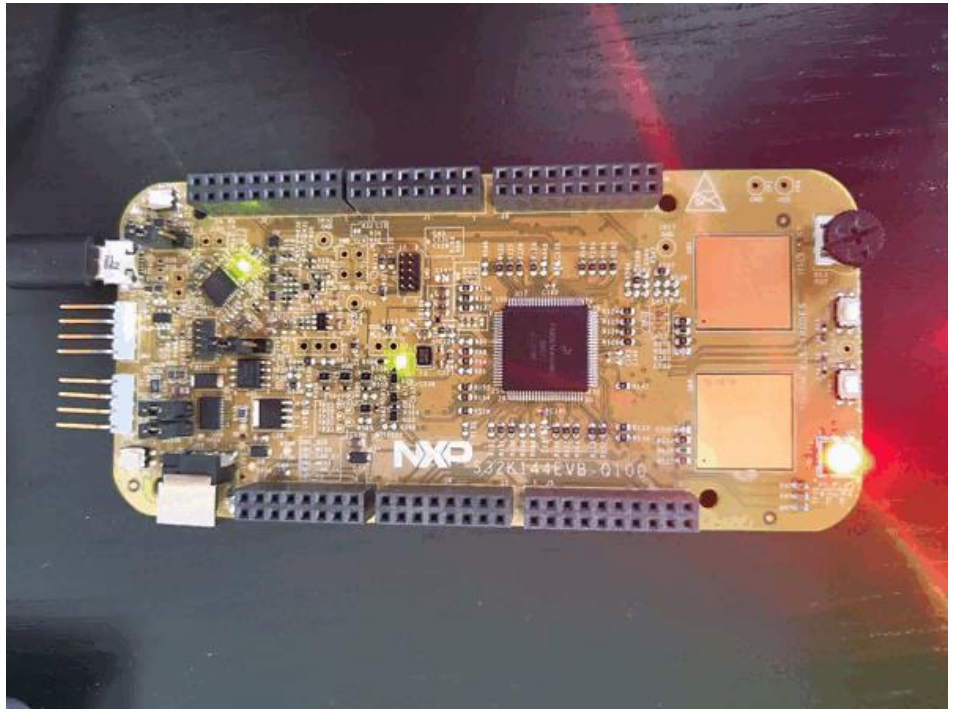




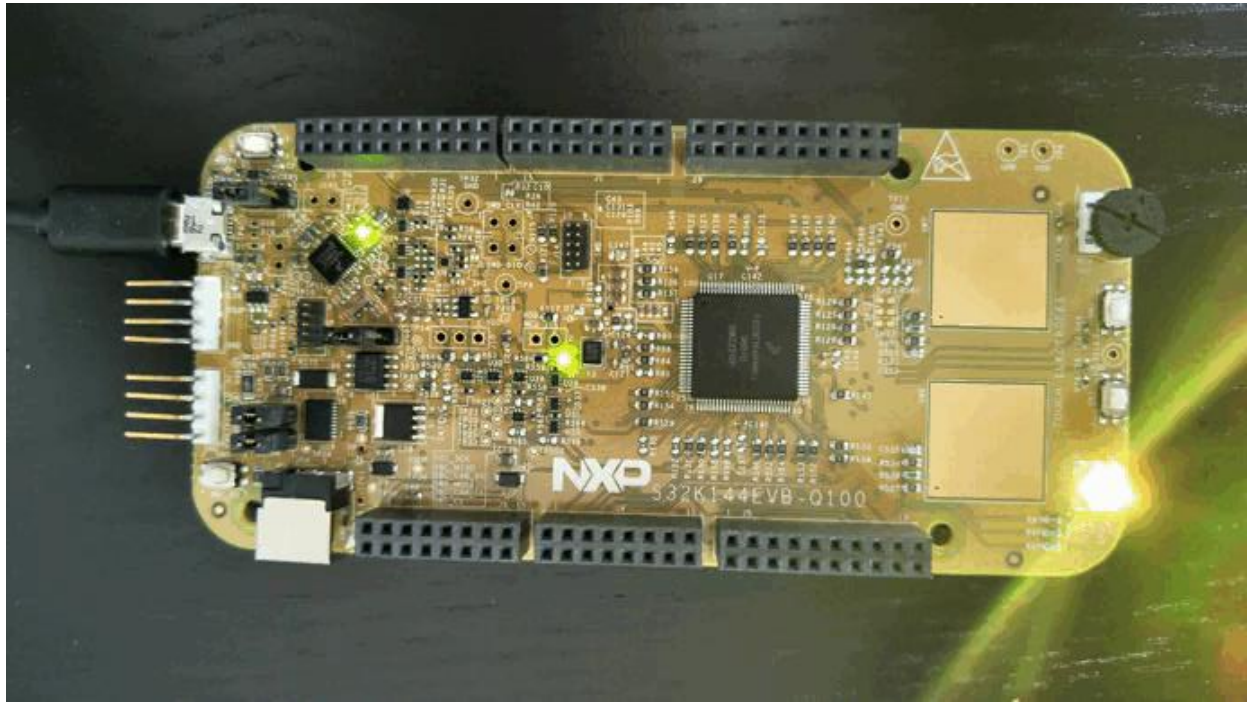
- RGB_BLUE – PTD0 ; RGB_RED – PTD15 ; RGB_GREEN – PTD16

Board pinout

Exercise: RED-YELLOW-BLUE



Before



Target result

REPLI-CAR NETWORK

LIGHTS CONTROL NODE
Replicate Body Control Module behavior
· Actuate lights (headlamps, turn indicators), horn and washer pump based on input controller from HMI
· Communications with other nodes: HMI, PCM, Brake, Steering, Comfort

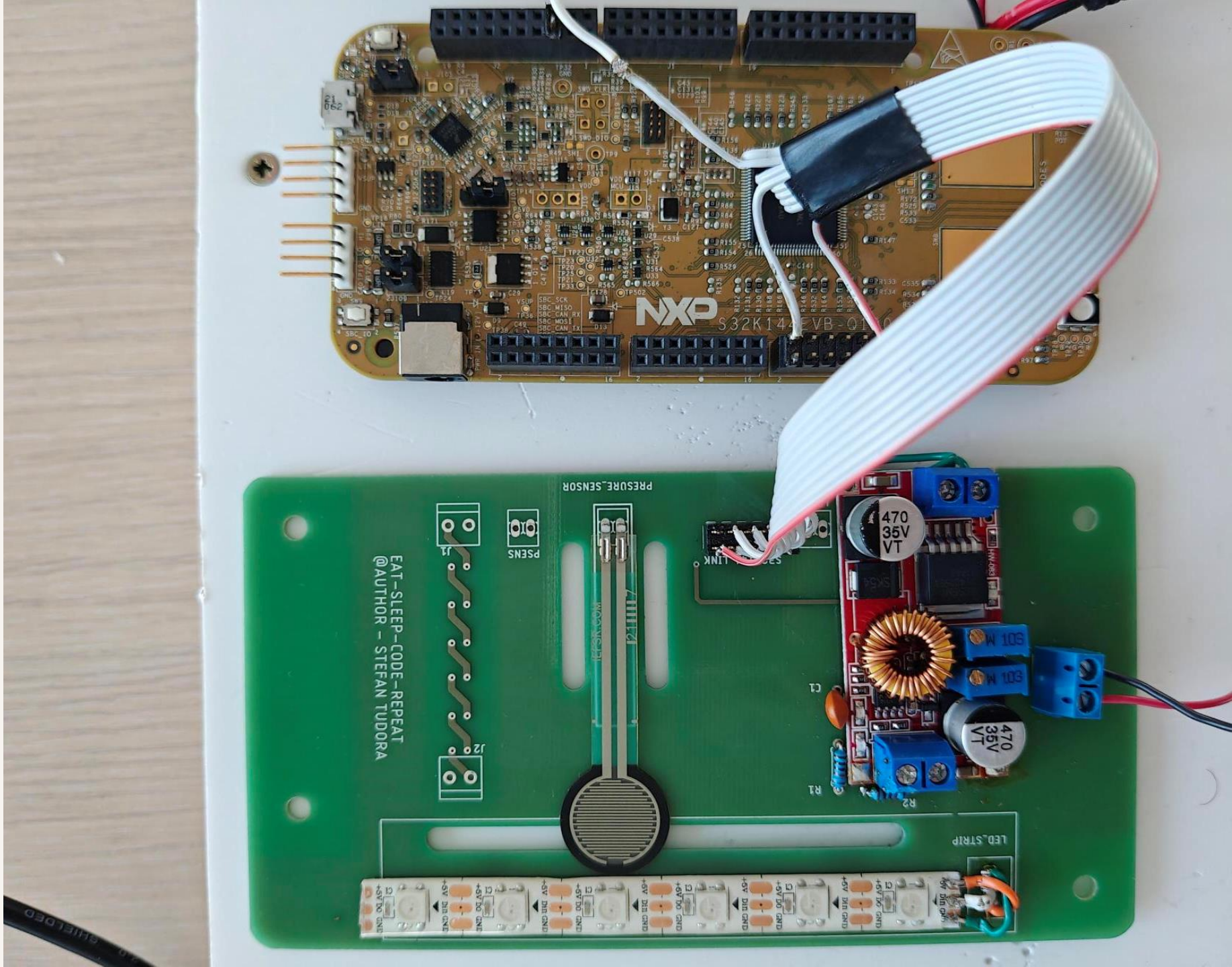
BRAKE CONTROL NODE
Replicate Brake Control Module behavior
· brake actuation and brake lamp indication based on input controller from HMI
· Communications with other nodes: HMI, PCM, BCM

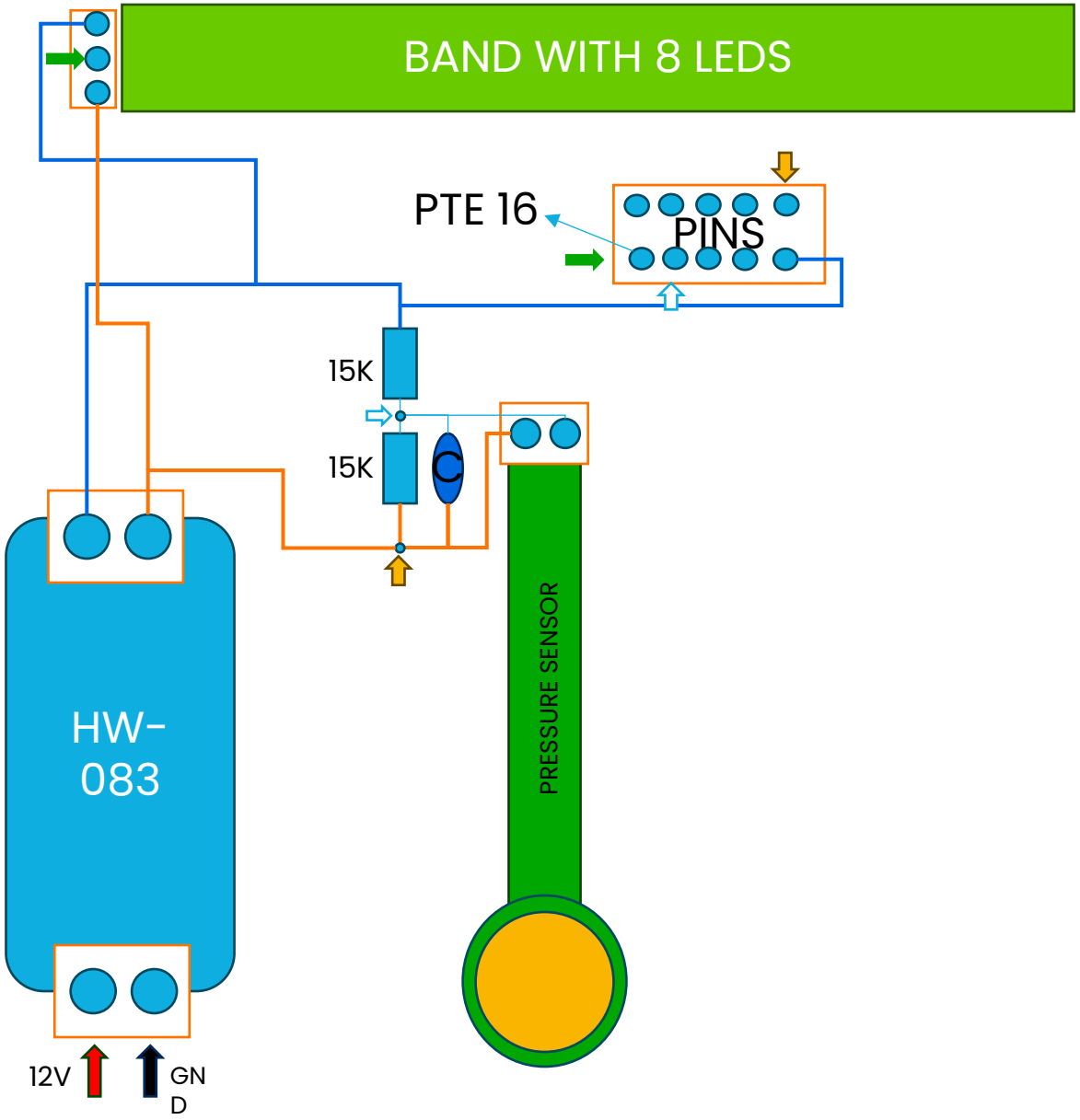
04

Brake

Exercise: BRAKE

BRAKE


NXP
S32K144EVB-Q100
PRESURE_SENSOR
PSENS
J1
J2
EAT-SLEEP-CODE-REPEAT
@AUTHOR - STEFAN TUDORA
470
35V
VT
LED_STRIP

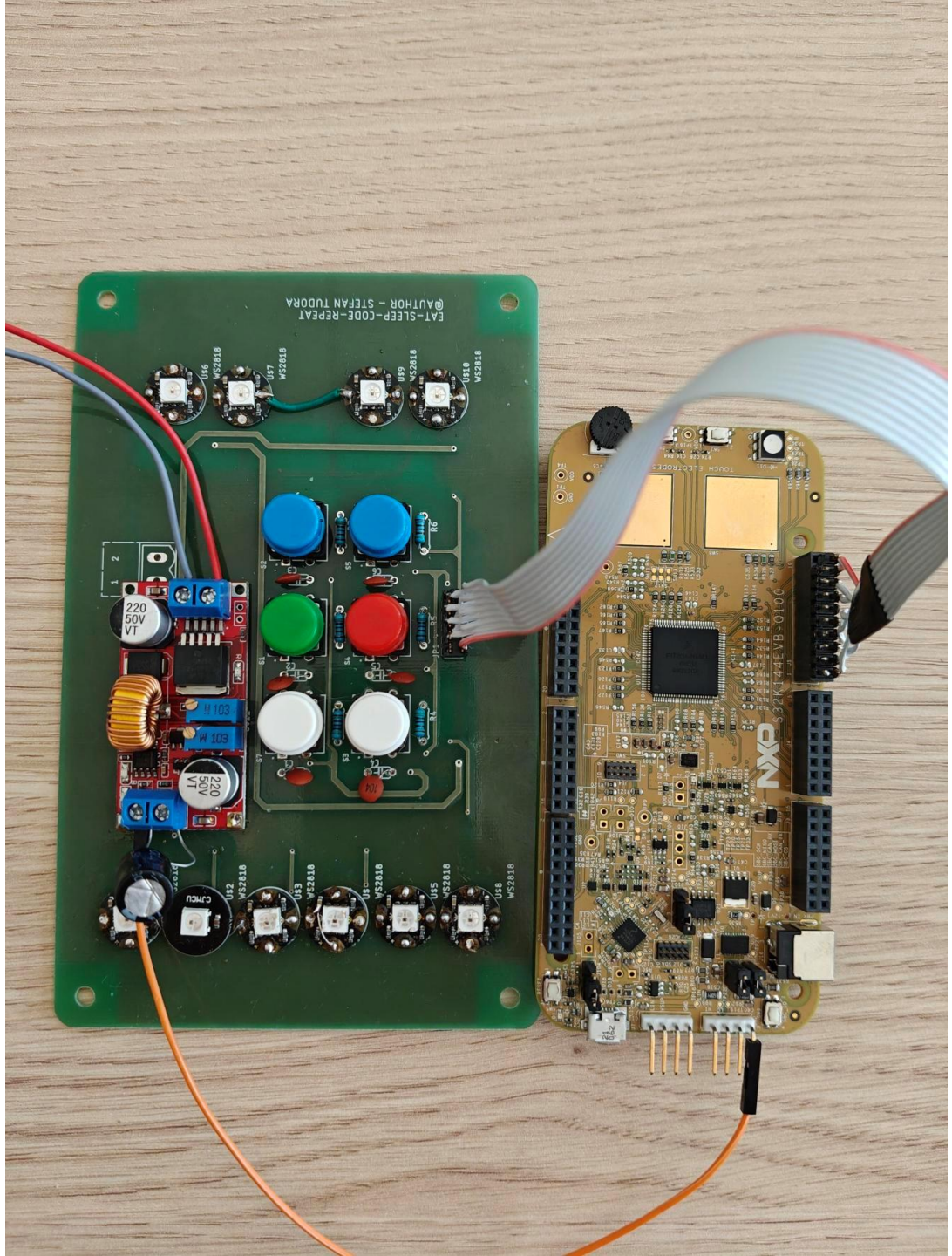

BAND WITH 8 LEDS
PTE 16
PINS
15K
15K
C
HW-
083
PRESSURE SENSOR
12V
GN
D

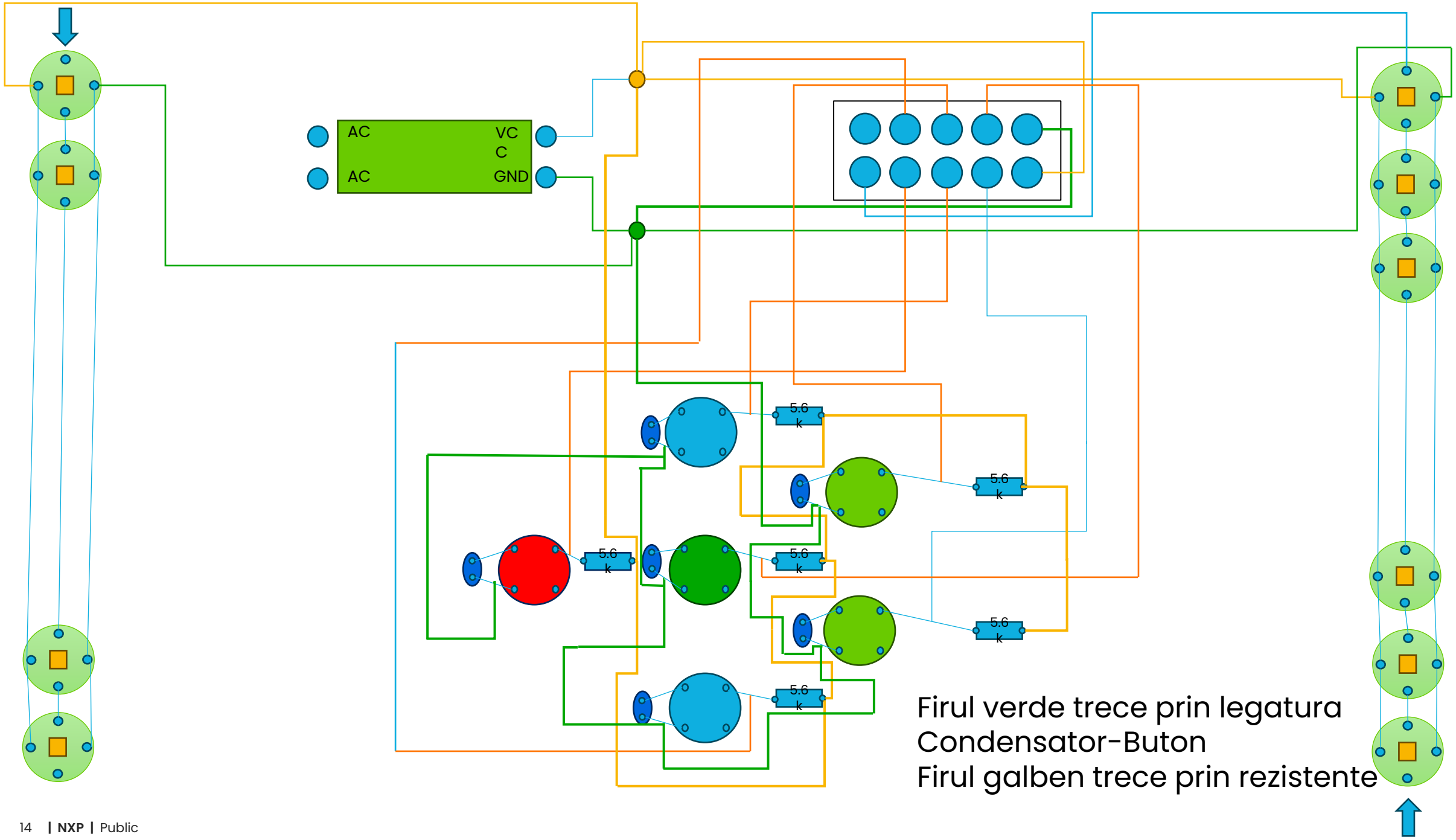
01

Lights (LCN)

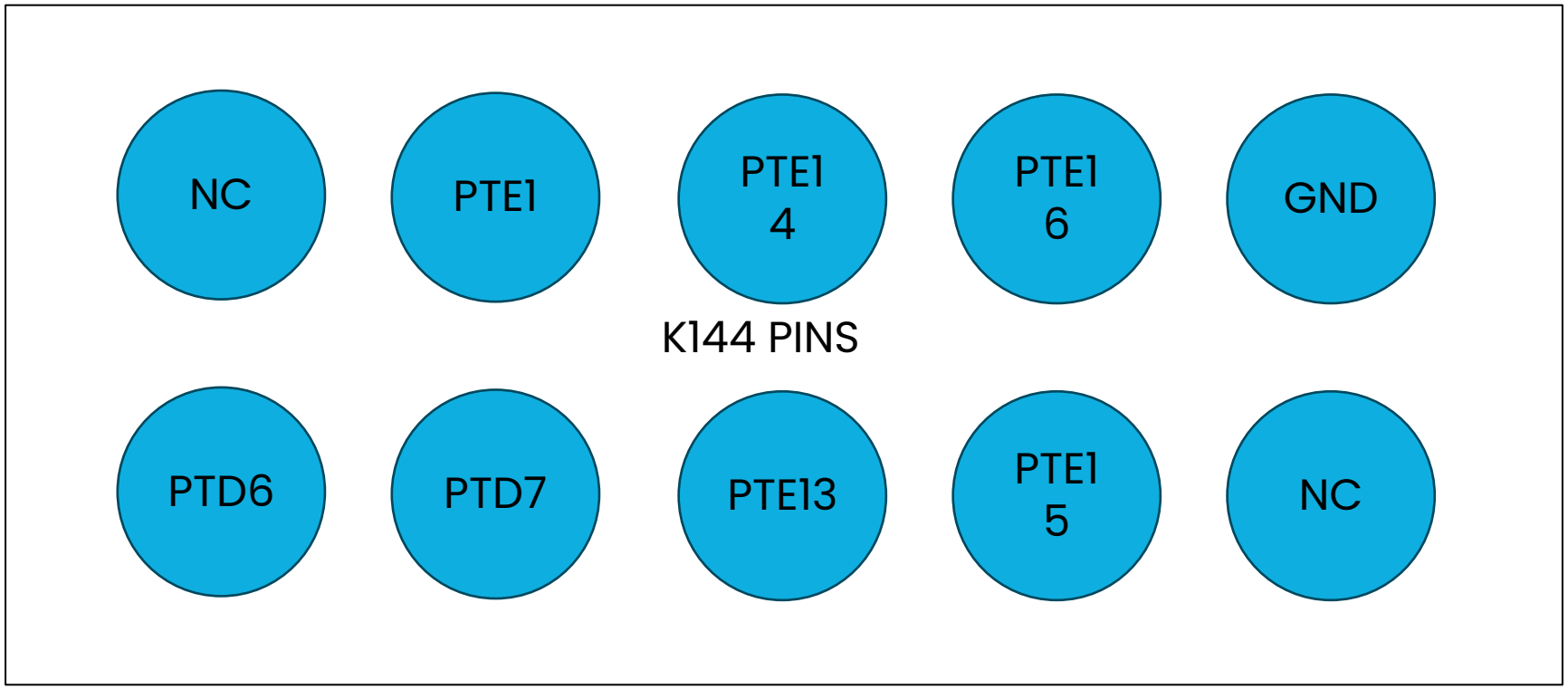
Exercise: LIGHTS

LIGHTS





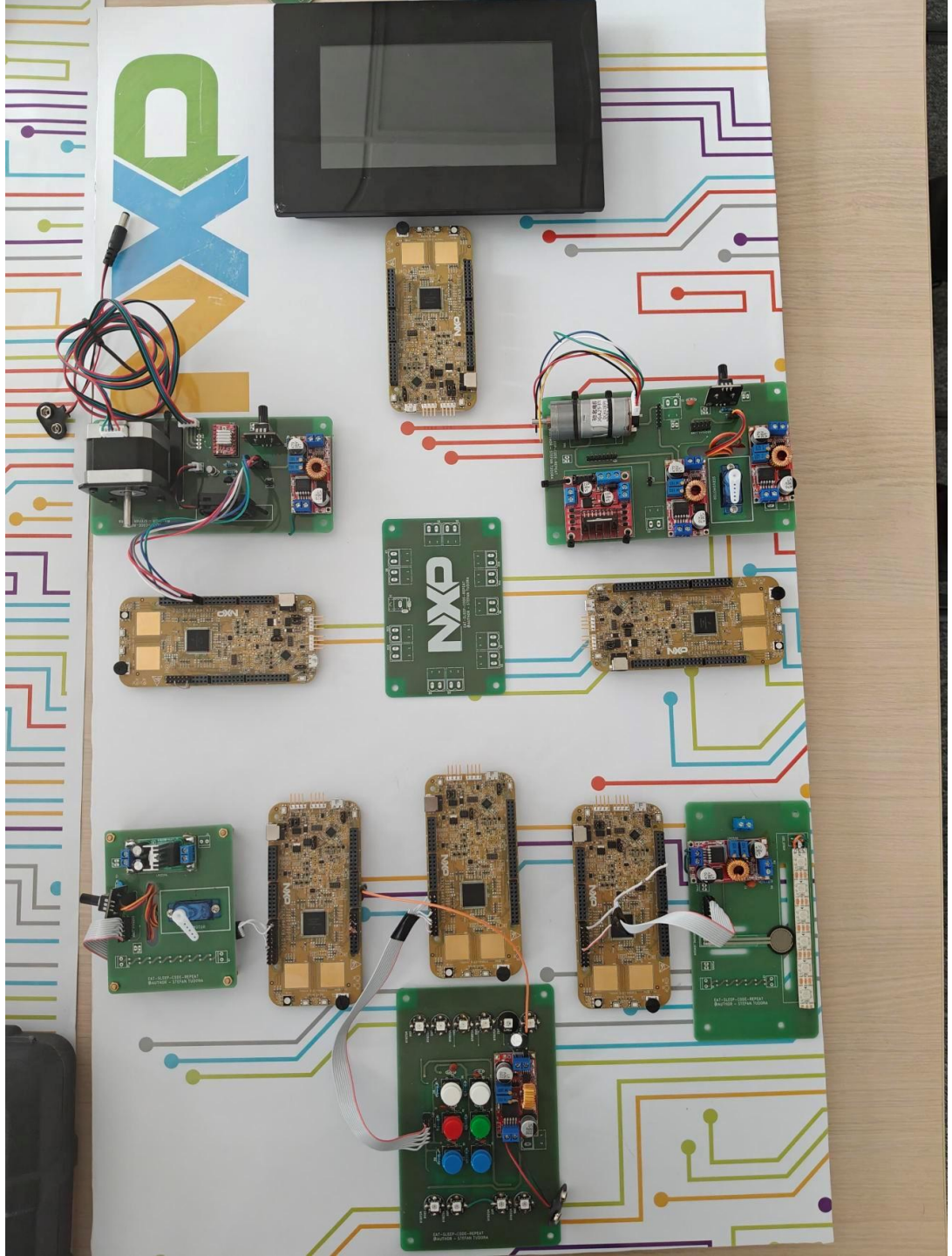
Firul verde trece prin legatura
Condensator-Buton
Firul galben trece prin rezistente

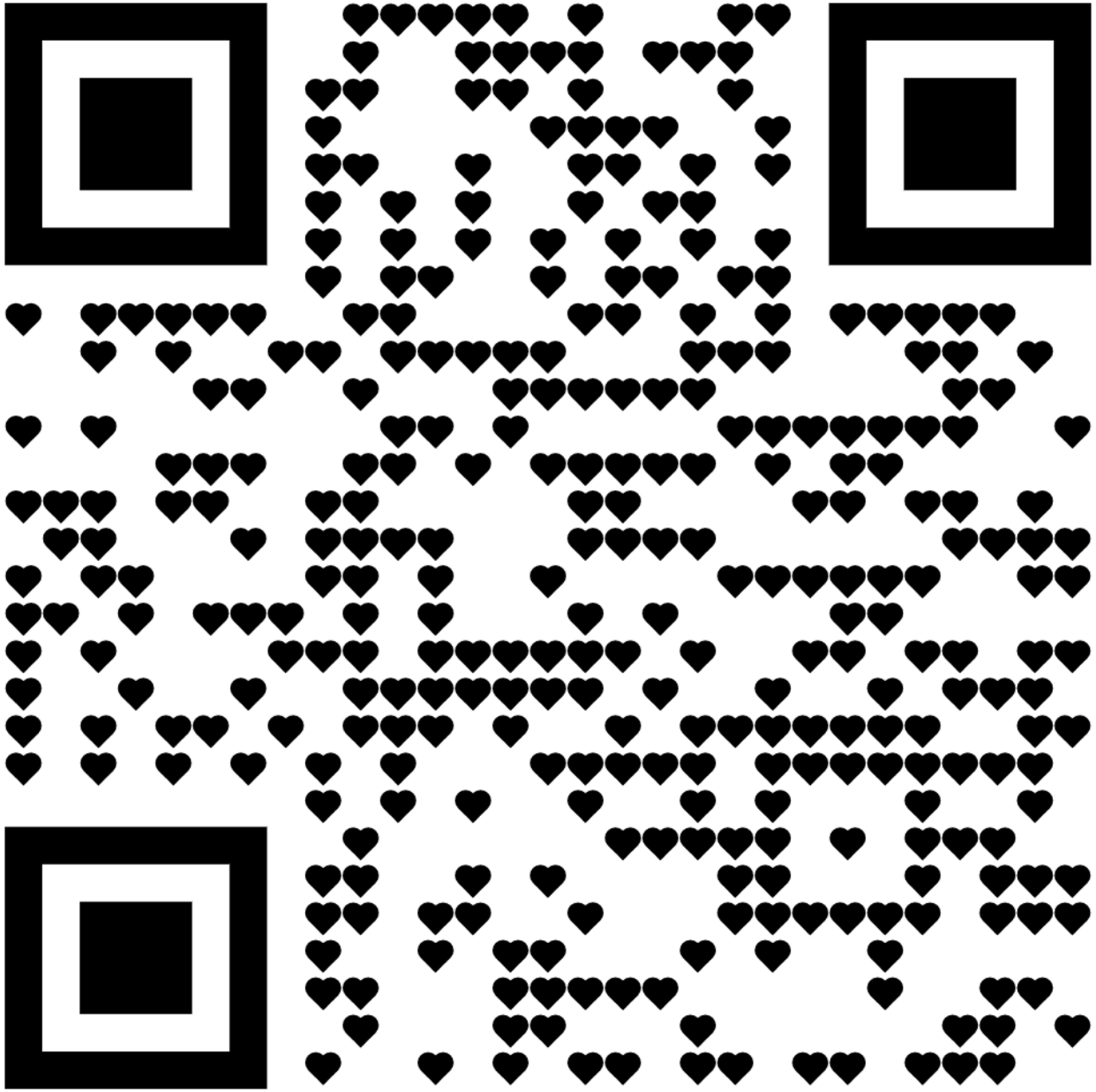

NC
PTE1
PTE14
PTE16
GND
K144 PINS
PTD6
PTD7
PTE13
PTE15
NC

04

FINAL SETUP

FINAL SETUP





Brighter
Together

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