SCHRACK TECHNIK LED PANEL

MANUAL-EN

PROJECT NAME: SchrackPanel

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WRITTEN BY: SAVVA POPOV

1. DESCRIPTION

Schrack Technik LED panel is a student-built project by SPŠ na Proseku students, the panel has two parts: Main frame and the controller box. Main frame is a custom table made by ARODEM, main frame has blue and red LEDs by Schrack Technik, the backside of the panel contains sensitive wiring, handle with care. Controlling unit is contained in the box.

2. INTRODUCTION

FRAME: Panel with pre-made holes was provided by company ARODEM, 1850x600 metal panel used for hanging tools and parts, the panel is hanged on the ARODEM table.

CONTROLLING UNIT: Controlling unit is a custom PCB, with ESP32 as its main microcontroller, utilizing shift registers as a main logic driver, VCC: 5V, VDD: 3.3V. Power supply of the PCB is DC-DC buck converter designed to maintain stable and efficient converting from 24V to 5V with minimal losses.

POWER SOURCE: Single output switching power supply inputs 230V from wall socket and outputs 24V, between the cable of a wall socket and a switching power supply we have ScharckTechnik circuit breaker installed for overcurrent/short circuit protection.

WIRING: Main wiring is contained in the back of the panel, LEDs don't just light up, they flicker, the main principal we are using is the perception of vision, human eye can't spot such fast changes, for smoothing out the flickering, we are using 10uF capacitors at every LED terminal. We used ethernet CAT6 cables that we then crimped and used them to connect to the PCB.

3. SAFETY PRECAUTIONS

- Handle main frame with care, wiring is fragile and can disconnect.
- Electrical box contains controlling unit, MOSFETs are prone to heating up while the panel is turned on, use installed 5V over the silver MOSFETs.
- Electrical box contains main power supply, it inputs 230V <u>DO NOT TOUCH</u> power terminals when the panel is turned on.
- Blue and red LED shields can scratch, use protective textile or other material for transportation.

4. FUNCTIONS

Universal button control:

GREEN start/confirmation

YELLOW pause/other

BLUE other

RED stop/cancellation

- TIME: Time function contains the "Predefined timer" and "Custom timer". Predefined timer lets you select you one of the predefined countdowns. Custom timer, set a custom time down to seconds, max 99h 59min 59s.

Operating instructions for TIME function: After the boot-up press **GREEN** to open main menu then press **YELLOW** to enter the TIME menu.
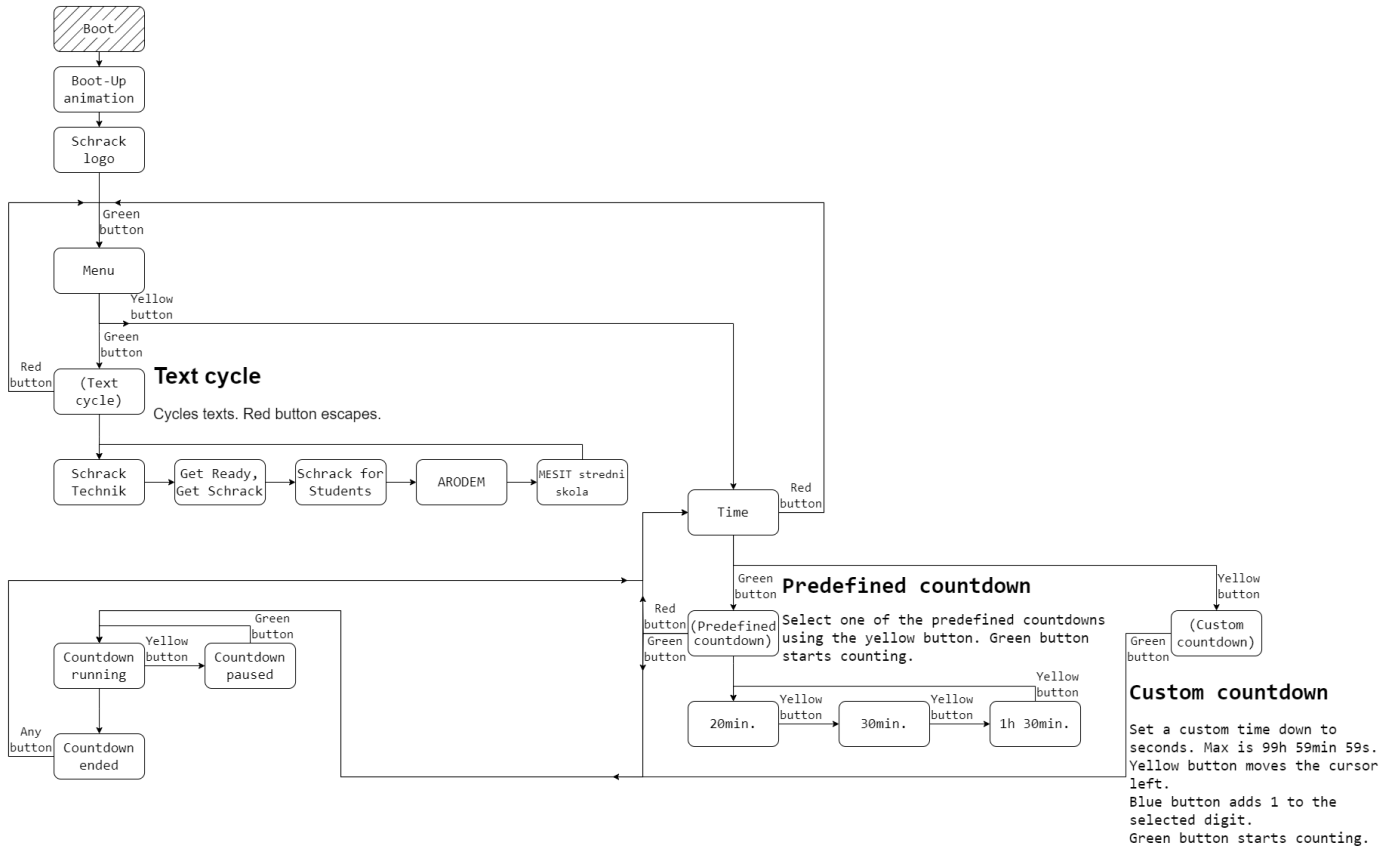
To enter "Predefined timer" press **GREEN** to select predefined time use **YELLOW** button, **GREEN** to start the countdown. To pause the predefined timer press **YELLOW**.

Pressing **YELLOW** after opening the TIME menu opens "Custom timer", digit selection is **YELLOW**, every **BLUE** press increases the time (0-9), **GREEN** starts the custom countdown. To pause the custom timer press **YELLOW**.

- TEXT CYCLING: Text cycling function cycles between predefined texts (Schrack Technik, Get Ready - Get Schrack, Schrack for Students, ARODEM, MESIT stredni skola), text slides one time then moves on onto the next one.

Operating instructions for TEXT CYCLING function Pressing **GREEN** in main menu enters "Text cycling". **RED** stops text cycling and returns to menu

5. SCHRACKPANEL FUNCTIONS BLOCK DIAGRAM

6. TECHNICAL SUPPORT

If any problems occur contact:

- SAVVA POPOV at SPŠ na Proseku, +420 605 570 366, popovsa22@sps-prosek.cz for electrical, PCB and mechanical questions.
- NATANI ŠIMÁČKOVÁ at SPŠ na Proseku, simacma22@sps-prosek.cz for software and wiring questions.
- JONÁŠ JARÝ at SPŠ na Proseku, jaryjo22@sps-prosek.cz for mechanical and wiring questions.