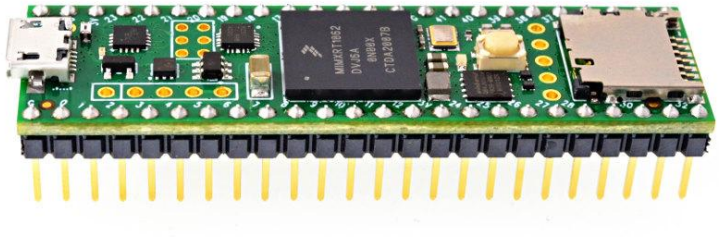
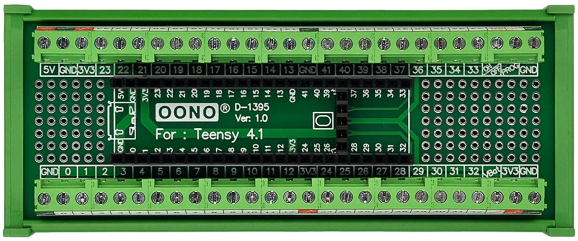
HARDWARE

Teensy 4.1: Handles gameplay logic, button handling, solenoid triggering, and audio triggering.



Teensy Audio Adapter: Attaches to the Teensy 4.1 for audio playback. Utilizes a stereo headphone (3.5mm) output.

Teensy 4.1 Breakout Board: This terminal-block breakout board is for conveniently connecting wires to the Teensy 4.1 IO.



Micro SD card: The SD card contains the game's sound files and the song's referential text files (for button light triggering). Additionally, the card contains a text file for user-defined gaming parameters.

Relays: The 3v relays are utilized for button light handling, solenoid triggering, spotlight triggering, and Semnox ticket activation. The sole 5v relay is utilized for the Semnox-triggered game start.

12v-to-5v Buck Converter: These units bucks the Semnox interface power lines from 12v to 5v (despite setting the Semnox unit's logic level to 5v).

5v-to-3v Logic Level Converter: This item is utilized for the ticket pulse level conversion (3v to 5v), generated from the Teensy, and received by the Semnox interface.

Mini PC: The inclusion of a mini PC is for remote-connection purposes (programming, troubleshooting, etc.). This PC must be capable of launching the Arduino IDE (with the Teensy Add-on).

Semnox LuminOS: This unit is a RFID Reader system developed by the company Semnox. It triggers the beginning of a game (through RFID reader/tag interaction) and handles e-ticket dispensing when interfaced with the Teensy 4.1 board.

Reader

Interface Board

SD CARD FILE

The Teensy Audio Adapter's card (FAT32) contains:

- Audio files for music playback
- Text files button-light (and attract-mode solenoid) triggering information
- Text file for user-defined game parameters

Audio Files:

Audio files must be named as numbers, such as "1.wav", "2.wav", "3.wav", etc. It must be noted that "7.wav" (temporary) is reserved for the attract song. The audio format is 44.1 kHz 16 bit (CD quality).

Text Files:

Similarly, all button-light triggering text files must be named as "1.txt", "2.txt", "3.txt", etc. This manner of numbering is necessary for associating the proper text file to its associated song (e.g. "1.txt" for "1.wav", "2.txt" for "2.wav"). It must be noted "7.txt" is reserved for attract mode and "userParameters.txt" for the user-defined parameter handling.

Songs' button-light-triggering [#].txt file format:

Trigger Time, P1-left-foot, P1-right-foot, P1-left-arm, P1-right-arm, P2-left-foot, P2-right-foot, P2-left-arm, P2-right-arm

Examples:

10550,1,0,0,1,0,1,1,0
11800,0,1,1,0,1,0,0,1
13050,1,0,0,1,0,0,1,1

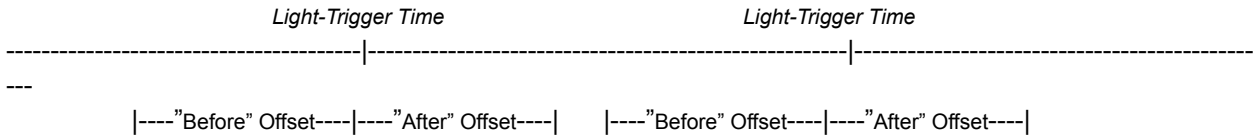
The trigger time is set to milliseconds, and the button-light activation (or solenoid activation during attract mode) is controlled by inputting a 1 within the list. Note: 0 should be entered if the specified light (or [attract] solenoid) does not need to be triggered.

userParameters Text File Values:

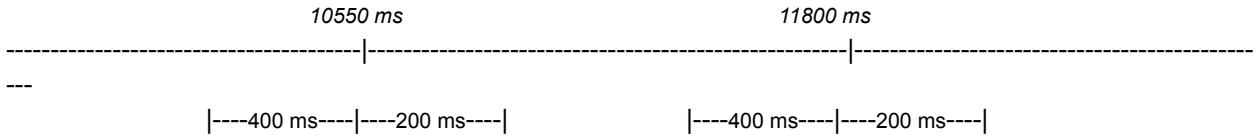
Button light, Solenoid, and Spotlight Test Time: This dictates the amount of button lights, solenoid, and spotlight activation-time (ms) during the game's boot. This was implemented for troubleshooting purposes.

Before-the-Trigger-Time Offset: This controls the button-light trigger time (ms) activation before the listed trigger time within the song's text file.

After-the-Trigger-Time Offset: This controls the button-light trigger time (ms) activation after the listed trigger time within the song's text file.



For example:



Button Pressed Interval: This is the amount of time (ms) an individual can press a button (during gameplay) and not accrue any point loss. Hence, if the user's button press time exceeds the value, a point is lost.

Pause for Intro Music: This dictates the amount of time (ms) between the RFID swipe and the beginning of the game. It was implemented to create space for a game-introduction spiel.

Trigger Attract Mode Time: This is the amount of time (ms) between the triggerings of the *Attract Mode* song. For example, a setting of 600000 will grant a 10 minute interval between the attract mode song triggering.

Percentage Correct: This (integer) parameter determines the percentage of correct button triggers to win the game.

userParameters Text Format:

Light/Solenoid Test Time, Before Offset, After Offset, Pressed Interval, Intro Pause, Attract Time, Percent Correct,

Example:
2000,625,250,1000,5000,10000,80,

****Note: a comma must be inserted after the last value (percentage correct).****