EDU-PLAY 4.0 – ARCADE MACHINE DOCUMENTATION

The arcade machine developed in EduPlay Project 4.0 is a collaborative effort aimed at teaching German and Czech students how to work better in teams and communicate in English. This section details the components used, the design and construction process, and provides an overview of the code implemented to bring the machine to life.

# Components used + voltage

There are four Wago terminal blocks inside the machine: one for 12V, one for 5V, and two for GND (these two are connected).

|  |  |  |
| --- | --- | --- |
| Component | Count | Voltage |
| Arduino MEGA | 1x | 12V |
| Arduino MEGA shield | 1x |  |
| Power supply | 1x | 12V OUT |
| Voltage converter | 1x | 12V IN, 5V OUT |
| Stepper motor | 2x | 12V |
| Inductive sensor | 7x | 5V |
| LED ring | 7x | 5V |
| Display | 1x | 5V |
| Joystick | 2x | 5V |
| Servo motor | 1x | 5V |
| Buzzer | 1x | 5V |
| Stop button | 4x | 5V |
| Button | 1x | 5V |

# Arduino pins

The table below details the connections between the Arduino MEGA and the various components of the arcade machine. Each component is connected to specific data pins on the Arduino to enable control and data acquisition.

## Pin mapping

|  |  |
| --- | --- |
| Component | Arduino data pin |
| Left stepper motor | 2, 3, 22, 23, 24, 25 |
| Right stepper motor | 4, 5, 26, 27, 28, 29 |
| Sensor 1 (lowest) | 30 |
| Sensor 2 | 31 |
| Sensor 3 | 32 |
| Sensor 4 | 33 |
| Sensor 5 | 34 |
| Sensor 6 | 35 |
| Sensor 7 | 36 |
| LED ring 1 (lowest) | 6 |
| LED ring 2 | 7 |
| LED ring 3 | 8 |
| LED ring 4 | 9 |
| LED ring 5 | 10 |
| LED ring 6 | 11 |
| LED ring 7 | 12 |
| Display | 20, 21 |
| Left joystick | A0 |
| Right joystick | A1 |
| Servo motor | 13 |
| Start button | 37 |
| Stop button – left down | 38 |
| Stop button – right down | 39 |
| Stop button – left up | 40 |
| Stop button – right up | 41 |
| Buzzer | 42 |

# 

# Code overview

The arcade machine's functionality is controlled by code running on the Arduino MEGA. The code handles input from the joysticks, buttons, and sensors, and controls the output to the LED rings, display, stepper motors, servo motor, and buzzer.

## Key Functions

1. **Initialization:** Setting up pin modes and initializing components.
2. **Input Handling:** Reading inputs from joysticks, buttons, and sensors.
3. **Control Logic:** Implementing the logic for game mechanics and interactions.
4. **Output Control:** Managing outputs to the LED rings, display, motors, and buzzer.

**You can view the code and this documentation online using this QR code containing a link to a GitHub repository.**

https://github.com/stefccc/EDU-PLAY-4.0/ 1