

METE HOCA

PANDASHIELD CORE



EDUCATION ARDUINO SHIELD (Rev.1)

USER MANUAL

(Last update: 31 May 2023)

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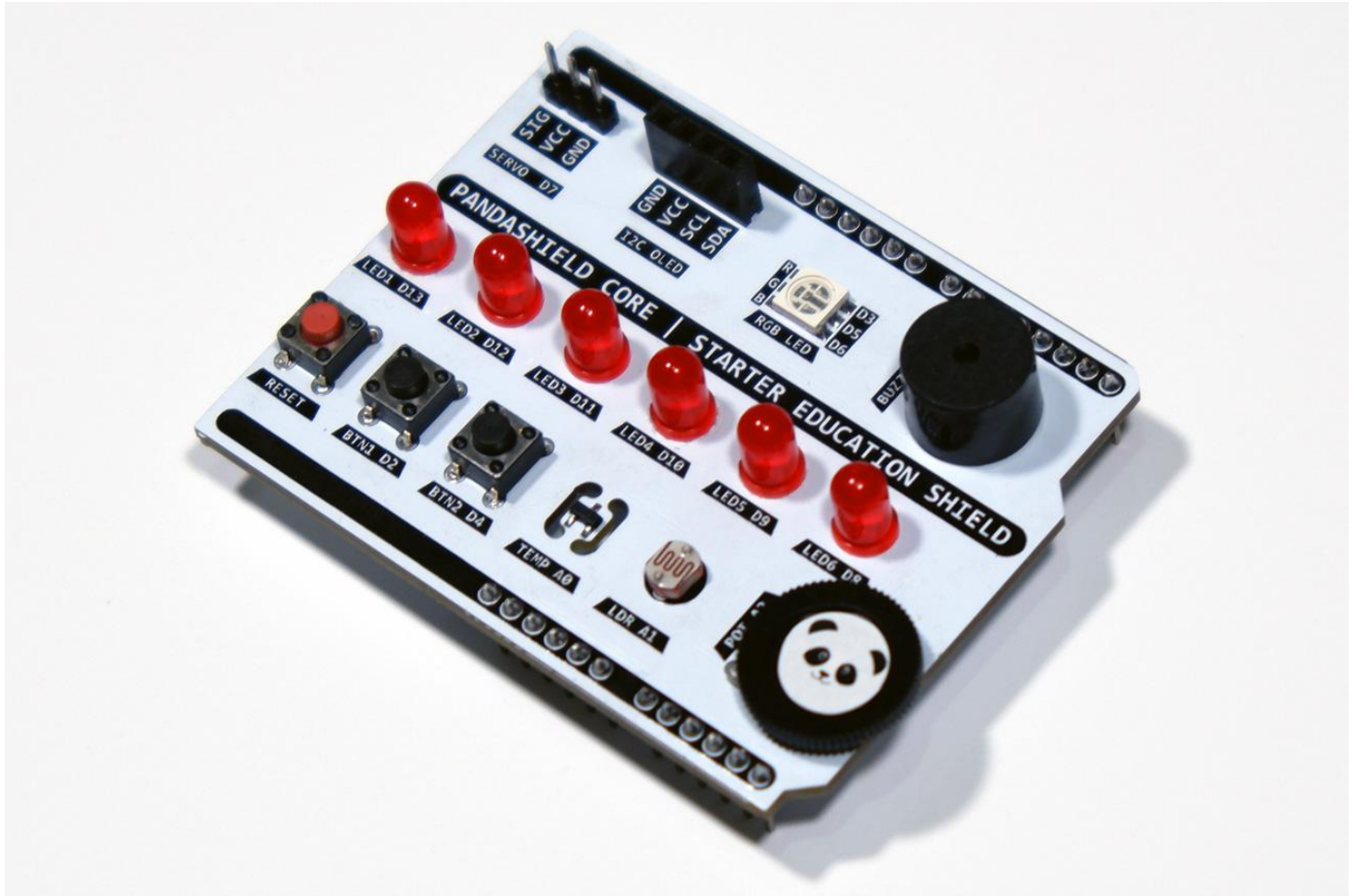
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May 2023, Mete K. Atay

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METE HOCA PANDASHIELD CORE | EDUCATION ARDUINO SHIELD

Learn the basics of electronics and Arduino programming with ease with this simple but well-crafted Arduino Uno shield.



The ultimate all-in-one Arduino education suite has arrived! Designed by an electronic engineer and teacher, this Arduino Uno shield is perfect for introducing students to the world of electronics and Arduino programming.

Featuring starter-type electronic components such as LEDs, buttons, buzzer, potentiometer, LDR light sensor, RGB LED and an analog temperature sensor called MCP9700, as well as mini servo and I2C OLED display connections, this well-crafted shield is the perfect all-in-one Arduino education tool.

PandaShield Core is easy to use and provides a comprehensive learning experience. It is designed to help students learn the basics of electronics and Arduino programming by allowing them to experiment and build their own sketches. The LED lights, buttons, buzzer, and sensors make it easy for students to create programs that respond to the environment.

This well-crafted shield is designed to make learning electronics and programming easy and fun. Whether you're a student, teacher, or hobbyist, our shield provides a hands-on learning experience that will unlock your creativity and teach you the fundamentals of Arduino.

The six 5mm LED lights on our shield can be used to create a variety of visual effects, and the three buttons allow for user input in your projects.

The potentiometer and LDR light sensor provide an excellent opportunity for students to learn about analog input. They can create projects that adjust the brightness of the LEDs based on the amount of light in the environment or control the volume of the buzzer based on the position of the potentiometer.

The RGB LED adds a touch of color to the projects and allows students to experiment with different colors and color combinations. They can create projects that change color based on the temperature or that react to sound or movement.

The MCP9700 analog temperature sensor is an excellent tool for teaching students about temperature sensing and control. They can create projects that adjust the temperature based on the readings from the sensor or that respond to changes in temperature in the environment.



In addition to these components, our shield also includes connections for a mini servo and I2C OLED display that provide even more opportunities for experimenting. The mini servo can be used to control small motors and create moving parts in your projects, while the I2C OLED display allows you to display text and graphics for a more interactive experience.

In addition to its educational focus, our shield is also built to last. We use only high-quality components and materials in its construction, ensuring that it will withstand repeated use and abuse in a classroom setting.

Overall, this well-crafted all-in-one Arduino education suite is the perfect tool for teaching students the basics of electronics and programming. It is easy to use, provides a comprehensive learning experience, and allows students to experiment and build their own projects. Whether used in a classroom setting or for individual learning, this shield is sure to inspire creativity and spark a love for electronics and programming.

PandaShield Core is easy to use and compatible with the Arduino Uno board. Simply plug the shield into the board, and you're ready to start experimenting and creating. Our shield is also compatible with the Arduino IDE, allowing you to write and upload your own programs.

READ BEFORE USING: PANDASHIELD CORE INSTRUCTIONS

To ensure a safe and successful experience with your shield, please carefully read and follow the instructions below:

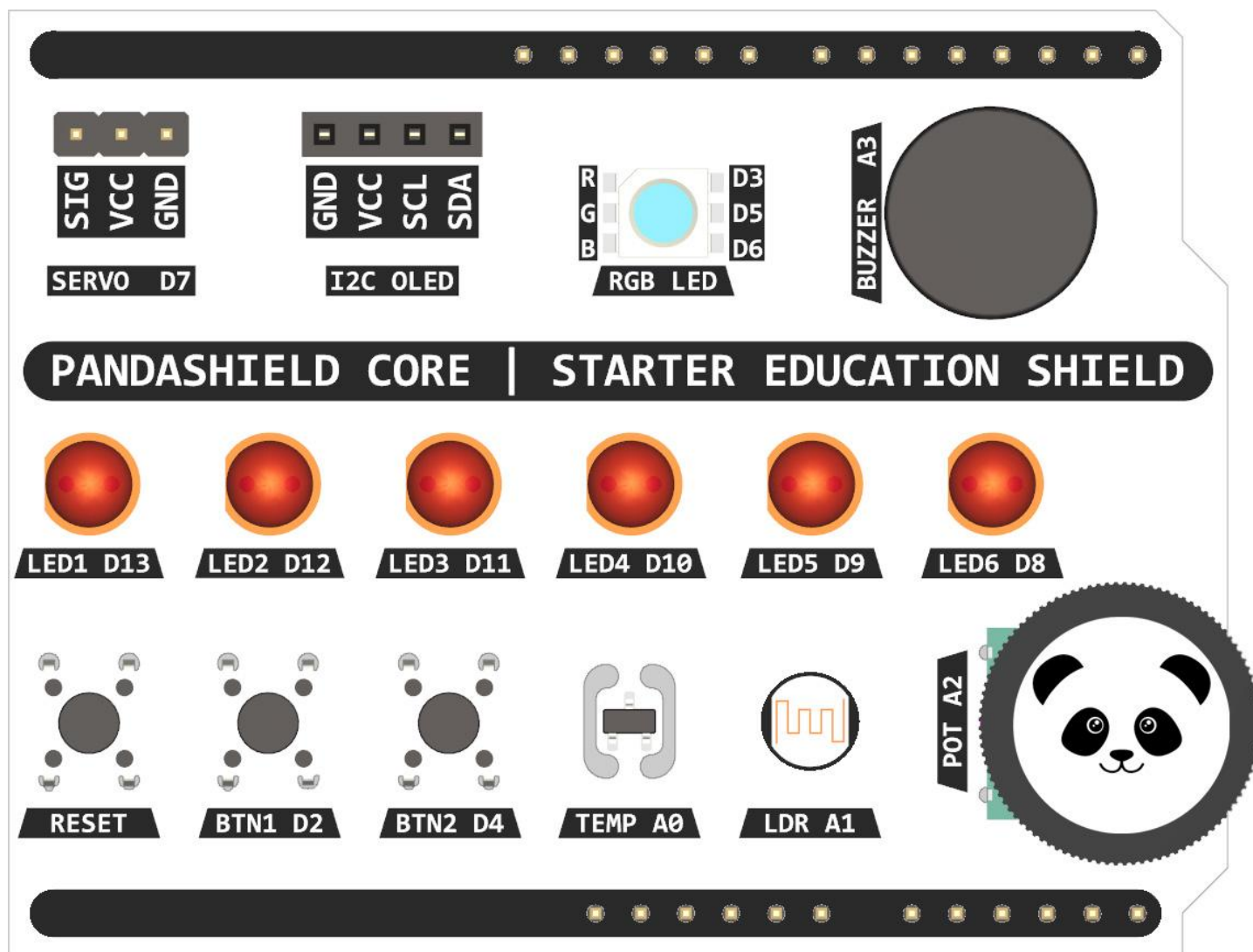
1. Shield Placement:
 - Before connecting the shield, make sure your Arduino Uno is powered off.
 - Align the shield's pins with the corresponding headers on the Arduino Uno.
 - Gently press the shield onto the headers, ensuring a secure connection.
 - Double-check the alignment to avoid bending any pins.
2. Environmental Precautions:
 - Keep the shield away from liquids, including water, beverages, or any other moisture source.
 - Do not operate the shield in humid or wet environments to prevent damage.
 - Store the shield in a dry and clean place when not in use.
 - Avoid exposure to extreme temperatures or direct sunlight.
3. Handling and Transport:
 - Always handle the shield with care and avoid excessive force or pressure.
 - Do not drop or strike the shield, as it may result in damage to the components.
 - When transporting the shield, use an anti-static bag or container to prevent electrostatic discharge (ESD).
 - Avoid storing or placing the shield on metal surfaces or objects to prevent short circuits.
4. Additional Safety Measures:
 - Do not attempt to modify or tamper with the shield's internal components.
 - Unplug the Arduino Uno from the power source when not in use or during maintenance.
5. Shield Maintenance:
 - Periodically check the shield for any loose connections, damaged pins, or signs of wear.
 - Clean the shield using a soft, dry cloth. Do not use water or any cleaning agents.
 - If you need to clean the shield's pins, use a small brush or compressed air to remove dust or debris gently.

By following these instructions, you will maximize the lifespan of your PandaShield Core and ensure safe and reliable operation. Remember, if you have any questions or concerns, refer to the user manual or contact me for assistance.



LET'S TAKE A CLOSER LOOK AT THE PANDASHIELD CORE

Hi, I'm PandaShield Core, your Arduino starter education shield!



PandaShield Core combines lots of different components in a small package. It has six LEDs, three buttons, a potentiometer, an RGB LED, a passive buzzer, an LDR light sensor and an analog temperature sensor (Microchip MCP9700).

It uses nearly all digital and analog pins of Arduino Uno. Shield does not use D0 and D1 digital pins. It's not recommended to use these pins because they are used for **UART** communication with USB interface.

PandaShield Core also has two external module connectors. One of them is a micro servo connector for SG90 type tiny servos, other one is an I2C connector that can be used for 128x64 pixel OLED displays. This connector uses Arduino Uno's **A4 (SDA)** and **A5 (SCL)** pins for I2C connection.

All the components on the shield has it's own label that shows it's name and Arduino pin number. For example **LED1 D13** means this LED is connected to 13th digital pin of the Arduino. **TEMP A0** means analog temperature sensor uses A0 analog pin of the Uno.

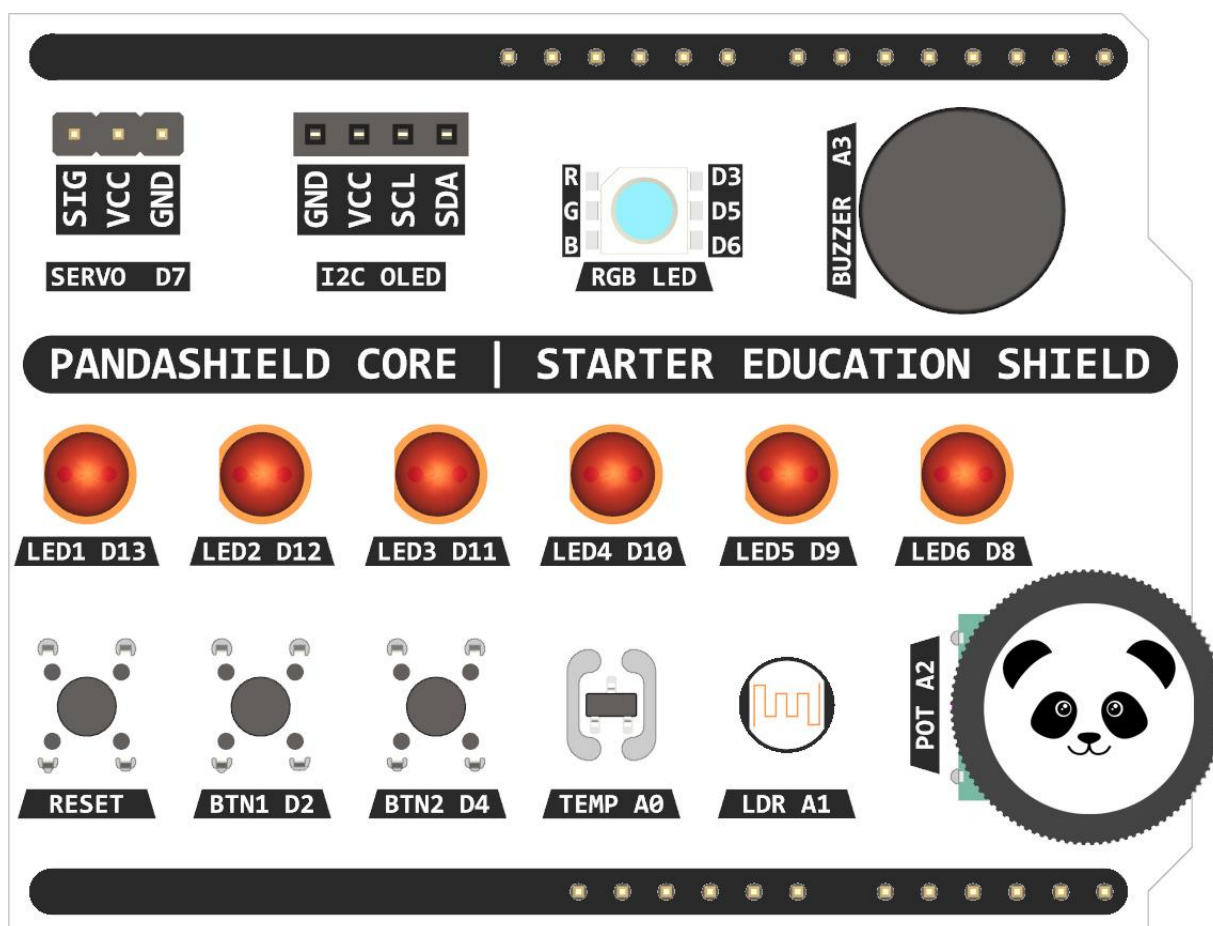
BTN1 and BTN2 have their own pull-down resistors connected, so there is **no need to use** internal pull-up resistors of the Arduino microcontroller. Set them as input and they will generate HIGH signal when pressed. RESET buton is connected to RESET pin of the Arduino.

Six 5 mm red LEDs and RGB LED has their own current limiter resistors. Resistor values set **visely**, so LEDs do not light way too bright.

COMPONENT CONNECTION PINS TABLE

All the components on the shield has it's own label that shows it's name and Arduino pin number. Here's the full list of the connections;

NAME	TYPE	ARDUINO PIN	DESCRIPTION
LED1	Output	D13	Red LED
LED2	Output	D12	Red LED
LED3	Output	D11 (PWM)	Red LED (Brightness can be change via PWM)
LED4	Output	D10 (PWM)	Red LED (Brightness can be change via PWM)
LED5	Output	D9 (PWM)	Red LED (Brightness can be change via PWM)
LED6	Output	D8	Red LED
RGB LED	Output	R=D3 / G=D5 / B=D6	RGB LED
RESET	Output	RESET	Resets Arduino
BTN1	Input	D2	Button with dedicated pull-down resistor.
BTN2	Input	D4	Button with dedicated pull-down resistor.
BUZZER	Output	A3	Passive buzzer
POT	Analog Input	A2	Feeds the analog pin with 0-5 Volt.
LDR	Analog Input	A1	Has its own voltage divider circuit for easy use.
TEMP	Analog Input	A0	Microchip MCP9700 analog temperature sensor
I2C OLED	I2C	I2C (A4 and A5)	0.96" 128x64 I2C OLED display connector
SERVO	Output	D7	Micro servo motor connection. It's recommended to use an external power supply when using servo with Arduino.





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