

Smart Time Stamp Recorder

Technical Specifications Proposal

ESP32 Integration:

- Configuring the ESP32 to interface with two push buttons and an additional button for Bluetooth activation.
- Developing firmware to detect button presses and trigger operations accordingly.
- Implementing timestamp storage in ESP32 flash memory upon button press, even in deep sleep mode.
- Sharing current timestamp from the mobile application to ESP32 during Bluetooth connection for accurate timekeeping.

Mobile Application Integration:

Flutter Application Development:

- Developing a Flutter application to establish a seamless Bluetooth connection with the ESP32 device.
- Designing an intuitive user interface (UI) for displaying timestamps retrieved from the ESP32.
- Implementing functionalities for initiating Bluetooth connection, sending timestamp requests, and receiving timestamp data from the ESP32.

Bluetooth Communication:

- Integrating Bluetooth communication protocols within the Flutter application to facilitate communication with the ESP32 device.
- Implementing data exchange protocols for sending timestamp requests and receiving timestamp data from the ESP32.
- Handling Bluetooth connection events, such as connection establishment and disconnection, to ensure robust communication.

Timestamp Display:

- Designing UI components to visually display the timestamps received from the ESP32 device.
- Formatting and presenting timestamp data in a user-friendly manner within the mobile application interface.
- Implementing features for real-time updating of timestamp data as new timestamps are received from the ESP32 device.

Security and Pairing:

- Implementing secure pairing process with a security code to establish a trusted connection between the mobile application and the ESP32 device.
- Ensuring data privacy and integrity during the Bluetooth communication process by implementing encryption and authentication mechanisms.

Power Management:

- Utilizing deep sleep mode of ESP32 to minimize power consumption when idle.
- Integrating lithium-iron rechargeable battery and charging circuitry for reliable power supply.
- Incorporating LED indicators for battery level indication (full or low) to enhance user experience and usability.

Enclosure Design:

- Designing a custom 3D-printed enclosure with dimensions of 6cmx6cmx4cm to house all components securely.
- Utilizing plastic material for 3D printing and applying a smooth finish through painting for aesthetics and durability.

Cost Breakdown:

- Development Cost: \$350
- Additional Costs:
 - PCB Printing: \$10
 - Electronic Components: \$30
 - 3D Printing: \$30
- Shipping Cost: Variable (depends on supplier and recipient locations)

Total Project Cost: \$420 (Development Cost + Additional Costs)

