

# Low-energy backup communication system for hydrogen racecar

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## Abstract

*The abstract is a brief (50–80 words) synopsis of the paper. Use up to 5 keywords.*

**Keywords**—component; formatting; style; styling; insert (key words)

## I. INTRODUCTION

## II. SYSTEM OVERVIEW

## III. FIRMWARE DESIGN AND IMPLEMENTATION

In this section, we present the design and implementation of the firmware for the STM32U5, which enables two-way raw LoRa communication, speech synthesis and voice command recognition.

### A. Firmware Design

[Describe the structure of the firmware. Mention FreeRTOS (if used), key modules/tasks, inter-process communication, power handling, interrupt strategies, etc.]

### B. Testing and Results

[Discuss how you verified the system. Include relevant metrics: timing, memory usage, communication robustness, etc. Optionally describe test setups.]

### C. Conclusion

[Summarize what you built, how well it works, and potential areas for improvement or future work.]

## IV. BACKEND AND GRAPHICAL USER INTERFACE DESIGN AND IMPLEMENTATION

## V. HARDWARE DESIGN AND IMPLEMENTATION

## REFERENCES

[1] Author Name, *Title of the Book or Article*, Publisher or Journal, Year.