Summary: The paper presents an integrated data logging and satellite telemetry in extreme high-altitude conditions, combining Campbell data loggers with the RockREMOTE modem. While the introduction effectively motivates the need for environmental data, and the manuscript provides detailed descriptions of system components, programming, and automated data workflows, the novelty and technical justification for design/instrument choices are often unclear. Key limitations include the lack of quantitative evaluation of telemetry performance, power consumption, data transmission reliability, and error handling. Also, minimal critical assessment of alternative loggers or satellite platforms. Overall, the manuscript demonstrates a functional and thoughtfully engineered deployment with promising automation and power management strategies for remote environmental monitoring.

Abstract

1. The title is generic and does not indicate what aspect of the system is novel.
2. The motivation in the abstract does not explain what exact limitations in existing data logging or telemetry systems necessitated this work.
3. It implies novelty using recent satellite IoT connectivity but does not explain why this integration represents an advance over previously available telemetry solutions. If this is the first time IoT has been used in this research domain, it would be helpful to highlight it.

Introduction

1. Lines 51-60: it does not clearly state a specific technical problem it addresses (e.g. data transmission reliability, power limits, data loss, or system lifetime), instead describing a general need for remote monitoring.
2. The literature focuses on field logistics and maintenance, with little discussion of existing satellite telemetry systems, making the novelty of the work unclear. It is not evident whether the system is an incremental improvement or a major advance over existing approaches.
3. Lines 63-64: the choice of Campbell Scientific loggers and Iridium Certus 100 telemetry is stated but not justified, and the limitations of alternative systems are not discussed.

Study site and data specification

1. Why were two different data loggers (CR1000 and CR1000X) used, and did their performance differ in any meaningful way?
2. Is 12 m depth driven by scientific needs, instrumentation constraints, or power/telemetry considerations?
3. The abstract and introduction emphasise power and data management strategies, but this section does not yet explain how the power system was sized or optimised for continuous operation.
4. The description of the RockREMOTE Mini integration is minimal; it is unclear whether any custom configuration or scripting was required, whether any default manufacturer settings were sufficient, or any communication issues arose during integration.

Data logging and telemetry system

1. Line 116: CR1000/CR1000X loggers- the implications are not discussed, did their performance differ, and was this a deliberate comparison or driven by equipment availability?
2. Line 179: the rationale for choosing IMT over IP-based communication is not discussed beyond general bandwidth efficiency.
3. Line 204: Power management via the modem sleep pin is central to the design, yet no quantitative estimate of power savings is provided.
4. Line 208-209: Retry logic is well described, but the manuscript does not report how often retries were required or how effective they were in practice.
5. Line 215: Buffering data for up to 4 days is a strong feature, but it is unclear how often buffering was used, whether truncation occurred, or whether the 4-day limit is a design choice or a hard constraint.

Power management

1. Line 244: Power management is framed as a 'critical design challenge', yet no quantitative energy budget is presented (e.g. daily generation vs. consumption), making it difficult to assess how close the system operated to power limits.
2. The use of lead-acid batteries is stated but not discussed critically. At this altitude and temperature range:
    a. Was reduced battery efficiency or cold-temperature degradation observed?
    b. Were battery temperatures monitored, and if so, how did they relate to voltage stability?

Interface: Cloudloop IoT platform

1. The section clearly explains how Cloudloop displays and forwards data, but remains largely descriptive. It would be helpful to have some quantitative performance metrics, such as message delivery success rates, transmission-to-receipt delays, or frequency of failed or delayed messages.
2. It is unclear whether Cloudloop provides automated handling of missing or corrupted messages, or whether continuous manual oversight is required.

Automated ETL pipeline for telemetry data processing

1. Excel file size limits are mentioned but not quantified. It is unclear how well this approach would work for higher data volumes, longer deployments, or more sensors.
2. The section does not explain how errors are handled, such as missing or corrupted emails, failed decoding, or partial data transfers.

Discussion

1. Section 1
    a. It highlights robustness under cloud cover and monsoon conditions, but no quantitative analysis of environmental factors affecting transmission quality (e.g., snow accumulation, ice movement, temperature fluctuations) is shown.

b. The comparison with alternative loggers and low-cost platforms is informative, but a more critical evaluation of why the CR1000/CR1000X was preferred (e.g., power efficiency, programming flexibility, telemetry integration) would strengthen the discussion.
c. Similarly, the discussion of alternative satellite platforms is thorough, but mostly descriptive; including comparative performance data or justification for selecting RockREMOTE Mini/Iridium beyond coverage and low power would enhance the argument.
d. The discussion notes that data remain stored in cloud and local systems, which is a strength, but there is no critical assessment of long-term data integrity, backup strategies, or potential cloud service limitations.

2. Section 2
   a. Claims that the system could support a broad range of alternative payloads are reasonable, but the manuscript does not critically evaluate limitations in power, bandwidth, or data handling that may arise with higher-volume sensors.
   b. The potential for contribution to early warning systems is intriguing, but the discussion is speculative; it would benefit from concrete examples or estimated performance requirements needed to make this feasible. Are there any anticipated limitations in scaling the system for real-time hazard monitoring networks?
   c. It emphasizes modularity and scalability, but does not discuss network management, cumulative power demand, or telemetry scheduling for multi-node future deployments.

Summary remarks

1. The summary effectively restates the main achievements of the system, emphasising reliability, power management, communication efficiency, and reproducibility.

2. Brief statements would be useful regarding future work related to:
   a. How transferable are the workflows to other telemetry platforms or non-Windows environments?
   b. Are there any plans to benchmark this system against alternative telemetry/logging platforms in terms of cost, reliability, or power efficiency?