Patent Search

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Abstract:

The present disclosure relates to systems and methods, and provides a portable emergency communication device (100) for enabling reliable voice and data commu disaster-affected and remote areas where conventional communication networks are unavailable. The portable emergency communication device (100) includes a ra server unit (102) acting as a central controller, a hybrid dual-radio communication architecture (110) integrating a LoRa SX1278 communication module (106) for long transmission and a NRF24L01 short-range communication module (108) for local data exchange, a self-healing wireless mesh network (112) that dynamically reroutes communication upon node failure, and a web-based monitoring interface (122) for real-time GPS tracking and system monitoring. The portable emergency communi (100) operates entirely without conventional communication infrastructure, thereby providing a cost-effective, reliable, and scalable communication solution that enh coordination, situational awareness, and response efficiency during emergencies.

Complete Specification

Description:TECHNICAL FIELD

[001] The present invention relates to the field of wireless communication systems and more particularly to a PORTABLE EMERGENCY COMMUNICATION DEVICE int long-range LoRa technology, short-range NRF24 wireless modules, embedded microcontrollers, GPS-based location tracking, and a self-healing mesh network archi for reliable off-grid emergency communication.

BACKGROUND

[002] The field of wireless communication systems has seen significant development in recent years, with increasing reliance on cellular networks, internet-based se and wired infrastructure for both routine and emergency communication needs. These conventional systems typically depend upon a centralised network of base s relay towers, and backbone connectivity to function. In disaster-affected environments such as those impacted by earthquakes, floods, or cyclones, such infrastruct suffer physical damage, power disruption, or severe congestion, rendering conventional communication services unreliable or entirely unavailable precisely when r communication is most critical for coordinating rescue operations and protecting human life.

[003] Conventional emergency communication approaches have typically relied upon satellite telephony, radio transceivers operating on fixed frequency bands, or dedicated cellular emergency networks. While such systems may provide some degree of coverage in certain scenarios, they generally require expensive dedicated hardware, licensed spectrum, or persistent connectivity to centralised infrastructure. These characteristics make deployment in rapidly evolving disaster environme logistically challenging, and the high cost and complexity of such systems may limit their availability to well-resourced agencies, leaving field-level responders and a individuals without adequate communication tools

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