Rancang bangun sistem panic button berbasis lora = Designing a panic button system based on lora

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Abstrak

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Pada lingkungan perumahan yang terdiri atas banyak penduduk, keadaan darurat mungkin saja terjadi. Keadaan darurat merupakan kondisi yang membutuhkan penanganan segera guna mengantisipasi terjadinya keadaan yang tidak diinginkan, khususnya berkaitan dengan keamanan, keselamatan, dan keselamatan. Oleh karena itu, dibutuhan suatu sistem yang dapat mengirim informasi secara efektif kepada pihak keamanan guna meminta pertolongan segera. Seiring dengan perkembangan Internet of Things, dapat dibuat suatu sistem panic button berbasis teknologi IoT, yakni teknologi LPWAN. LoRa merupakan salah satu teknologi LPWAN yang memiliki kemampuan jarak jangkau jauh, konsumsi energi rendah, dan biaya rendah sehingga cocok digunakan pada implementasi sistem. Pada penelitian ini digunakan LoRa 915 MHz dengan topologi jaringan Star. Sistem panic button dilengkapi dengan buzzer dan lampu strobo LED pada sisi pengirim sebagai pengkondisian keadaan darurat pada lingkungan sekitar lokasi. Selain itu, sistem dilengkapi dengan Web PC Server pada sisi penerima agar informasi dapat ditampilkan saat terjadi keadaan darurat. Kinerja sistem dapat diukur dengan menguji fungsionalitas sistem, yakni realibilitas waktu penekanan tombol, jeda waktu pengiriman data, jangkauan jarak LoRa. Berdasarkan uji coba penelitian didapatkan realibilitas waktu penekanan maksimum selama 20.12 menit, jeda waktu pengiriman data rata-rata sebesar 12.37 detik, rata-rata PDR 87.69, dan tingkat keberhasilan 82.18. Sedangkan, jarak jangkau maksimum LoRa sejauh 1200 meter urban area dengan nilai minimum (Received Signal Strength) RSSI sebesar-133 dBm dan sejauh 2000 meter pada rural area dengan nilai maksimum (Received Signal Strength) RSSI sebesar-137 dBm.
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ABSTRACT
In a residential environment consisting of many residents, emergencies may occur. An emergency is a condition that requires immediate handling to anticipate the occurrence of undesirable conditions, especially related to security, safety and safety. Therefore, a system is needed that can send information effectively to security forces to request immediate assistance. Along with the development of the Internet of Things, a panic button system based on IoT technology can be created, namely LPWAN technology. LoRa is one of the LPWAN technologies that has the capability of long range, low energy consumption, and low cost so it is suitable for use in system implementation. In this study used LoRa 915 MHz with Star network topology. The panic button system is equipped with a buzzer and LED strobe lights on the sending side as emergency conditioning in the surrounding environment. In addition, the system is equipped with a Web PC Server on the recipients side so that information can be displayed during an emergency. System performance can be measured by testing the systems functionality, namely the reliability of button press time, data transmission time lag, LoRa distance range. Based on the research trials, the maximum suppression time was obtained for 20.12 minutes, the average data transmission time lag was 12.37 seconds, the average PDR was 87.69, and the success rate was 82.18. Meanwhile, the maximum distance of LoRa is 1200 meters urban area with a

minimum value of Received Signal Strength of-133 dBm and as far as 2000 meters in the rural area with the Received Signal Strength RSSI of-137 dBm.