US 20240214115A1

(19) United States

(12) Patent Application Publication (10) Pub. No.: US 2024/0214115 A1

JUNG et al. (43) Pub. Date: Jun. 27, 2024

(54) METHOD AND APPARATUS FOR TRANSMITTING SIGNALS USING FREQUENCY HOPPING

(71) Applicant: **ELECTRONICS AND TELECOMMUNICATIONS RESEARCH INSTITUTE**, Daejeon (KR)

(72) Inventors: **Soo Yeob JUNG**, Daejeon (KR); **Mi Kyung OH**, Daejeon (KR); **Joon Gyu RYU**, Daejeon (KR); **Sang Jae LEE**, Daejeon (KR)

(73) Assignee: **ELECTRONICS AND TELECOMMUNICATIONS RESEARCH INSTITUTE**, Daejeon (KR)

(21) Appl. No.: **18/396,528**

(22) Filed: **Dec. 26, 2023**

(30) **Foreign Application Priority Data**

Dec. 27, 2022 (KR) 10-2022-0186199

Publication Classification

(51) **Int. Cl.**

H04L 1/00 (2006.01)
H04L 5/00 (2006.01)
H04L 27/26 (2006.01)

(52) **U.S. Cl.**

CPC ***H04L 1/0061*** (2013.01); ***H04L 1/0071*** (2013.01); ***H04L 5/0012*** (2013.01); ***H04L 27/2605*** (2013.01)

(57) **ABSTRACT**

A transmission device in a satellite IoT system may comprise: a CRC value generator that receives first data and generates and outputs a payload CRC value; a forward error correction encoder that receives second data consisting of the first data and the payload CRC value from the CRC value generator, and performs forward error correction coding on the second data; an interleaver that receives third data consisting of the forward error correction coded first data and the payload CRC value from the forward error correction encoder, and outputs interleaved payload blocks by performing cyclic shifts on the forward error correction coded first data based on offsets; and a frequency hopping unit that receives the interleaved payload blocks from the interleaver, and generates and transmits payload blocks frequency-hopped according to a hopping sequence.