

Lunar Exploration (3)
Lunar Technologies (2B)

Author: Mr. Yin Long

Institute of Manned Space System Engineering, China Academy of Space Technology (CAST), China,
ly24381@163.com

Mr. Song Chen

Institute of Manned Space System Engineering, China Academy of Space Technology (CAST), China,
chens86@163.com

Dr. Yang Wang

Institute of Manned Space System Engineering, China Academy of Space Technology (CAST), China,
happyangw@yahoo.com

Mrs. Yalin Zhang

Institute of Spcae Mechanics and Electricity, China, antzyl@163.com

RESEARCH OF WIRELESS SENSOR NETWORK FOR EXPLORATION OF LUNAR ENVIRONMENT

Abstract

The current Wireless Sensor Network(WSN) is investigated and analyzed, and the influence of the lunar on the WSN is discussed. To meet the special demands of the lunar, an exploration method for lunar based on WSN is proposed. The nodes, the network and the protocol are designed respectively, and the applicability for the lunar circumstance is also analyzed. Firstly, the node of WSN adopt module design, the intelligent solar cells is designed to support the node's long-term work. A kind of outline package is designed for the node to prevent it from burying by the lunar dust, and improves its radiation protection. Thermal control is also designed to get an excellent high and low temperature performance for the node. Secondly, An energy balancing routing method based on multi-hop and cluster routing is proposed to enhance the lifetime and the robustness of the network. Finally, the protocol for the lunar, relay satellite and earth station integrated network is proposed, and the protocol conversion of the WSN and the relay satellite is designed in detail.