

SPACE COMMUNICATIONS AND NAVIGATION SYMPOSIUM (B2)
Fixed and Broadcast Communications (7)

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A STUDY OF ZIGBEE M2M HYBRID ARCHITECTURE BASED ON KA BAND MULTIPLE SPOT
BEAM SATELLITE COMMUNICATION SYSTEM**Abstract**

The M2M based on Inmarsat BGAN is successfully applied in power grid, and Inmarsat BGAN system adopt L band frequency with the disadvantage of narrow band, low gain, low throughput capacity and expensive. The BGAN M2M system is simply used to data acquisition and without network architecture. The highlight of Ka band multiple spot beam satellite is flexible spot beam, high throughput capacity, high gain, low cost, independent infrastructure and it suit for the application in oil gas pipeline monitoring, bridge tunnel monitoring, emergency survey etc. The Ka band satellite communication terminal is compact, low power consumption, high throughput capacity, inexpensive is suit for large-scale deployment. The key challenge is how to satisfy the time delay, jitter and dynamic response requirement. We propose a cross-layer handshake protocol to accomplish a hybrid network with ZigBee protocol and DVB-S2/RCS protocol. The satellite terminal is based on DVB-S2/RCS architecture and adopt wakeup-burst transmission mechanism which is satisfy the requirement of the low power consumption. The satellite terminal is central node and other sensor is normal node and all these nodes is self- Self-organized network with mixed star or mesh network. The simulation results demonstrate the transmission range is up to 120 meters among these nodes and is strong robustness .The network adopt the solar power and rechargeable batteries to guarantee reliability ,high efficiency and durability in rugged surroundings.