



# 供用电

Distribution & Utilization

2019年 第36卷 第6期 总第223期

泛在电力物联网专刊

## 信息技术支撑 泛在电力物联网建设

泛在电力物联网，就是围绕电力系统各环节，充分应用移动互联、人工智能等现代信息技术、先进通信技术，实现电力系统各个环节万物互联、人机交互，具有状态全面感知、信息高效处理、应用便捷灵活特征的智慧服务系统。



# 供用电

GONG-YONGDIAN

第 36 卷第 6 期 (总第 223 期) 2019 年 6 月 5 日出版

## 目次

### 主编寄语

信息通信技术支撑泛在电力物联网建设 ..... 专刊特约主编 孙德栋 (01)

### 泛在感知

基于海燕 610 微处理器的 FTU 设计与实现 ..... 赵海波, 甄岩, 王立城 (02)

泛在电力物联网智联单元设计与实现 ..... 王洪勉, 孙慧, 郑利斌, 李新军 (05)

居民侧智能用电泛在感知技术与多元精准服务研究 ..... 李琳, 魏鑫, 孙胜宇 (10)

### 通信网络

电力无线专网深度覆盖技术研究与应用 ..... 刘卉, 欧清海, 宋继高, 刘军雨, 王艳茹, 马文洁 (16)

基于改进蝙蝠算法的电力无线专网室内覆盖优化策略研究 ..... 郭丹丹, 宋继高, 王炫中, 王昕, 王艳茹 (23)

基于北斗电力应用的新能源电厂调度数据安全采集研究 ..... 马军, 庞辉, 聂海涛, 张丽丽, 吴小鸥, 廖宝全 (29)

### 智慧平台

区域智慧能源综合服务平台建设与应用 ..... 刘晓静, 王汝英, 魏伟, 闫松, 张立, 张海涛, 刘万龙 (34)

电力物联网多渠道客户服务中台战略研究与设计 ..... 林鸿, 方学民, 袁葆, 欧阳红 (39)

面向电力行业的物联网平台设计及应用 ..... 郭文静, 刘迪, 丁学英 (46)

### 业务应用

基于智能配变终端的低压配电网智能运检体系构建研究 ..... 肖新华, 黄明烨, 宋志强 (55)

多站融合的商业模式与发展路径研究 ..... 张越, 王伯伊, 李冉, 弭希瑞 (62)

基于业务中台的全渠道运营支撑平台架构设计研究 ..... 赵冠东, 张才俊, 欧阳红, 洪杨 (67)

基于营配贯通的电网故障智能抢修作业 ..... 马晶, 胡杨 (72)

电力营销多渠道微服务架构设计 ..... 刘俊玲, 杨维, 朱平飞, 欧阳红, 洪杨 (78)

### 安全保障

基于泛在电力物联网的全场景网络安全防护体系研究  
..... 殷树刚, 许勇刚, 李祉岐, 李宁, 孙磊, 刘圣龙, 王利斌, 冯磊 (83)

### 本期广告索引

封二 《供用电》新设“泛在电力物联网”栏目  
后插一 《供用电》“中国科技核心期刊”收录证书

前插一、后插二、后插三、封三、封底 国网信通产业集团

Distribution & Utilization  
Vol. 36 No. 06 (Ser. 223) June 5, 2019  
MAIN CONTENTS

**Ubiquitous Sensing**

- FTU Design and Realization Based on Haiyan610 MCU  
..... ZHAO Haibo, ZHEN Yan, WANG Licheng ( 15 )
- Design and Implementation of Wisdom Unit in the Ubiquitous Internet of Things in Electricity  
..... WANG Hongmian, SUN Hui, ZHENG Libin, LI Xinjun ( 28 )
- Resident-side Intelligent Power Ubiquitous Sensing Technology and Multi-precision Service Research  
..... LI Lin, WEI Xin, SUN Shengyu ( 15 )

**Communication Network**

- Research and Application of Deep Coverage Technology for Electric Wireless Private Network  
.....LIU Hui, OU Qinghai, SONG Jigao, LIU Junyu, WANG Yanru, MA Wenjie ( 22 )
- Research on Indoor Coverage Optimization Strategy of Electric Wireless Private Network Based on Improved Bat Algorithm  
..... GUO Dandan, SONG Jigao, WANG Xuanzhong, WANG Xin, WANG Yanru ( 28 )
- Research on Secure Power Dispatching Data Acquisition in New Energy Power Plant Based on Application of Beidou Technology  
..... MA Jun, PANG Hui, NIE Haitao, ZHANG Lili, WU Xiaou, LIAO Baoquan ( 33 )

**Intelligent Platform**

- Construction and Application of the Regional Smart Energy Integrated Service Platform  
.....LIU Xiaojing, WANG Ruying, WEI Wei, YAN Song, ZHANG Li, ZHANG Haitao, LIU Wanlong ( 38 )
- Research and Design of Business Platform Strategy for Multi-channel Customer Services in Internet of Things in Electricity  
..... LIN Hong, FANG Xuemin, YUAN Bao, OUYANG Hong ( 66 )
- Design and Application of Internet of Things Platform for Power Industry  
..... GUO Wenjing, LIU Di, DING Xueying ( 54 )

**Business Application**

- Research on Construction of Intelligent Transportation Inspection System for Low-voltage Distribution Network Based on Intelligent Distribution Terminal  
..... XIAO Xinhua, HUANG Mingye, SONG Zhiqiang ( 61 )
- Research on Business Mode and Development Path of Multi-station Integration  
..... ZHANG Yue, WANG Boyi, LI Ran, MI Xirui ( 66 )
- Research on Architecture Design of Multi-channel Operation Support Platform Based on Business Middle-platform  
..... ZHAO Guandong, ZHANG Caijun, OUYANG Hong, HONG Yang ( 61 )
- Intelligent Repair Operation for Power Grid Fault Based on the Connection between Marketing and Power Distribution  
..... MA Jing, HU Yang ( 77 )
- Design of Multi-channel Micro-service Architecture for Electric Power Marketing  
..... LIU Junling, YANG Wei, ZHU Pingfei, OUYANG Hong, HONG Yang ( 82 )

**Security Assurance**

- Research on Full-scenario Network Security Protection System Adapted to the Ubiquitous Internet of Things in Electricity  
..... YIN Shugang, XU Yonggang, LI Zhiqi, LI Ning, SUN Lei, LIU Shenglong, WANG Libin, FENG Lei ( 89 )

---

**Competent Authorities** State Grid Corporation of China  
**Sponsor** Yingda Media ( Shanghai ) Co., Ltd. and State Grid Shanghai Municipal Electric Power Company  
**Editor and Publisher** Editorial Department of Distribution & Utilization  
**Editor in Chief** Yu Yixin ( Academician )  
**Publication Number** ISSN 1006-6357 CN 31-1467/TM

**Pirce** RMB 30 HKD 60  
**Website** www. gydi. cbpt. cnki. net  
**Tel** 86-10-63412343, 63412464  
**Add** No. 19, West Street of Beijing Railway Station, Dongcheng District, Beijing ( 100005 )  
Published in monthly and on the 5th day of each month