



BMS of H3G-TA Lead-acid & Ni-cd Battery Energy Storage

H3G-TA **Battery Monitoring System**

BMS Technology Serves Global Customers



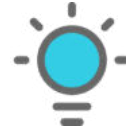
Founded in 2005



Industry NO.1



3+ Drafting Industry Standards



30+ Patents



High-tech Enterprise



40+ International Business



Partners



I. Industry

More than 60% of power system problems are caused by battery failure



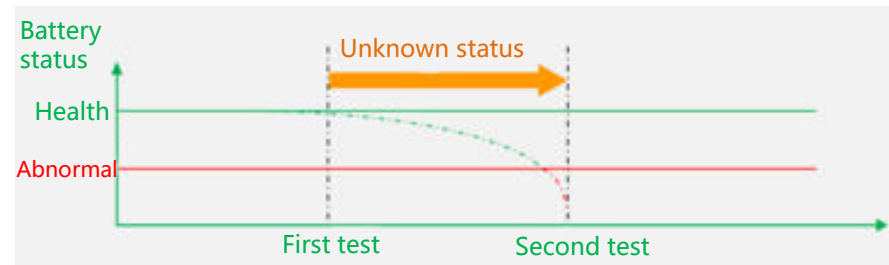
- Battery problems
- UPS problems
- Human factors

Problem	Situation	Result
Open circuit, short circuit	Abnormal voltage, abnormal capacity, slow charging, fast temperature rise	Power down
Battery loses water	Increased internal resistance, abnormal capacity, rapid temperature rise	Fire
Battery swollen	Increased internal resistance and obvious temperature rise	Power down, fire
Loose terminal	Internal resistance increases, temperature increases	Fire



Disadvantages of manual inspection/ traditional inspection equipment

- The cost of manual inspection is high, wasting time and energy
- High manual operation risk and long cycle
- The traditional inspection instrument has complicated layout and high cost
- Both accuracy is easy to be affected, the data is distorted
- Lack of data analysis and key indicators monitoring to identify backward batteries



**Power system down/fire, traditional inspection will
bring losses to the computer room, and even
lead to serious accidents**



Battery Maintenance

IEEE 1188-2005 IEEE Recommended Practice for Maintenance, Testing, and Replacement of Valve-Regulated Lead- Acid (VRLA) Batteries for Stationary Applications

Monthly inspection	Quarterly inspection	Annual inspection
String voltage	Cell internal resistance	Connection resistance
Charger output current and voltage	Battery negative temperature	Ripple voltage and current
Ambient temperature	Cell voltage	
Whether the appearance of the battery is rusted, cracked, deformed, or leaking		
Floating current		

International Standards

1. ANSI/TIA-942: Telecommunications Infrastructure Standard for Data Centers
2. IEEE – 1491 – 2005 IEEE Guide for Selection and Use of Battery Monitoring Equipment in Stationary Applications

 II. Advantages

H3G-TA system can perfectly solve the problem of battery monitoring in the computer room and improve safety

H3G-TA Core Tech.

1. Real-time monitoring and alarm
2. Advanced anti-interference and low power consumption design
3. High accuracy data
4. High accuracy SOC/ SOH

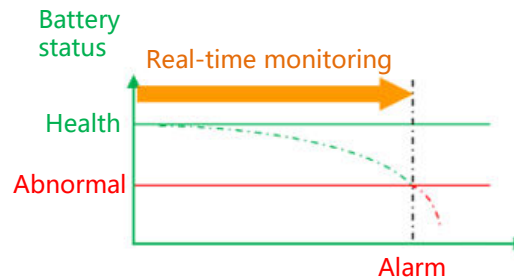
1. Real-time monitoring and alarm

- For monitoring cell voltage, cell internal resistance, negative pole temperature
- When the parameters are abnormal, the devices will promptly alarm, which can eliminate the hidden safety problems caused by the detection of the gap period of the traditional inspection
- Work with Huasu BMDM-ND03 software to perform AI analysis on battery data (optional)
- Work with MM-07 monitoring module to comprehensively improve the safety of the computer room (optional)



MM-07 monitoring module (optional)

BMDM software (optional)



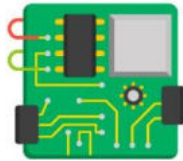
2. Advanced anti-interference and low power consumption design

- Excellent product design, can block the ripple interference of high-power high-frequency UPS
- Working current as low as 3 mA without affecting the cells being monitored

Marstech

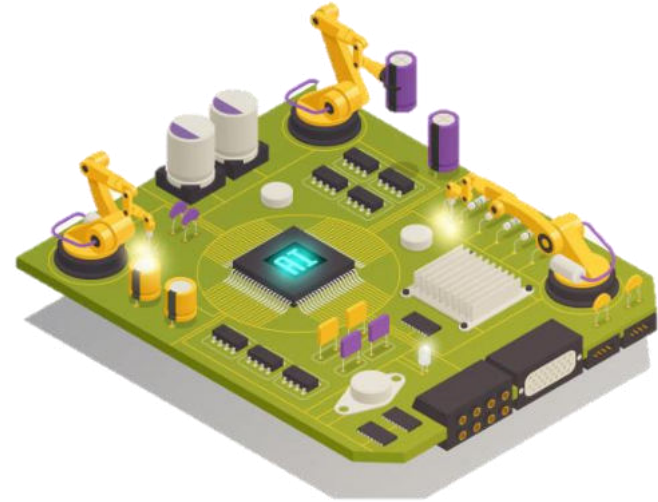
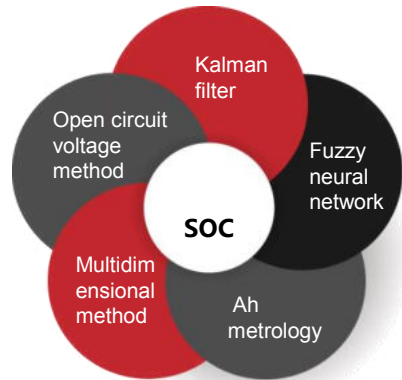
3. High accuracy data

- Adopt Huasu's collection and testing technology patent to achieve accurate measurement of internal resistance, voltage and temperature



4. High accuracy SOC/ SOH

- Online parameter identification, self-correcting charging, no jump, full operating conditions, SOC error $\leq 5\%$, improving battery efficiency and operating safety;
- Kalman filtering, multi-dimensional algorithms are used. Provides high-accuracy SOC, improving traditional BMS accuracy from $\pm 10\%$ to $\pm 5\%$



H3G-TA comparison

Category	Item	H3G-TA	Regular BMS	Solution
Security	Anti-ripple interference	High	Low	Block ripple interference of high-power high-frequency UPS
	Data update speed	Fast	Regular	Improve data timeliness and maintain accuracy
Tech.	Power consumption	3mA(Low)	10~200mA	Only 30% of the lowest power consumption of traditional solutions
	SOC/ SOH accuracy	High	Low	SOC/ SOH data is more accurate
	Cell internal resistance	50 ~ 65535 $\mu\Omega$	50 ~ 65535 $\mu\Omega$	Accurate measurement of battery internal resistance
Function	String voltage	20~800V	20~800V	Suitable for most systems on the market
	Cell voltage	1.2V, 2V, 6V, 12V batteries	1.2V, 2V, 6V, 12V batteries	Suitable for most systems on the market
	Cell negative pole	-5 ~ +99.9 $^{\circ}\text{C}$	-5 ~ +99.9 $^{\circ}\text{C}$	Accurate measurement of battery negative temperature

Application cases

BMS of China Bank



BMS of China Baidu Data Center



BMS of China Baidu Data Center



III. Product

Application

Huasu H3G-TA system is widely used in data center, telecom, enterprise, finance, petroleum and petrochemical, power, aviation and other industries



BMS of Data Center



BMS of Telecom

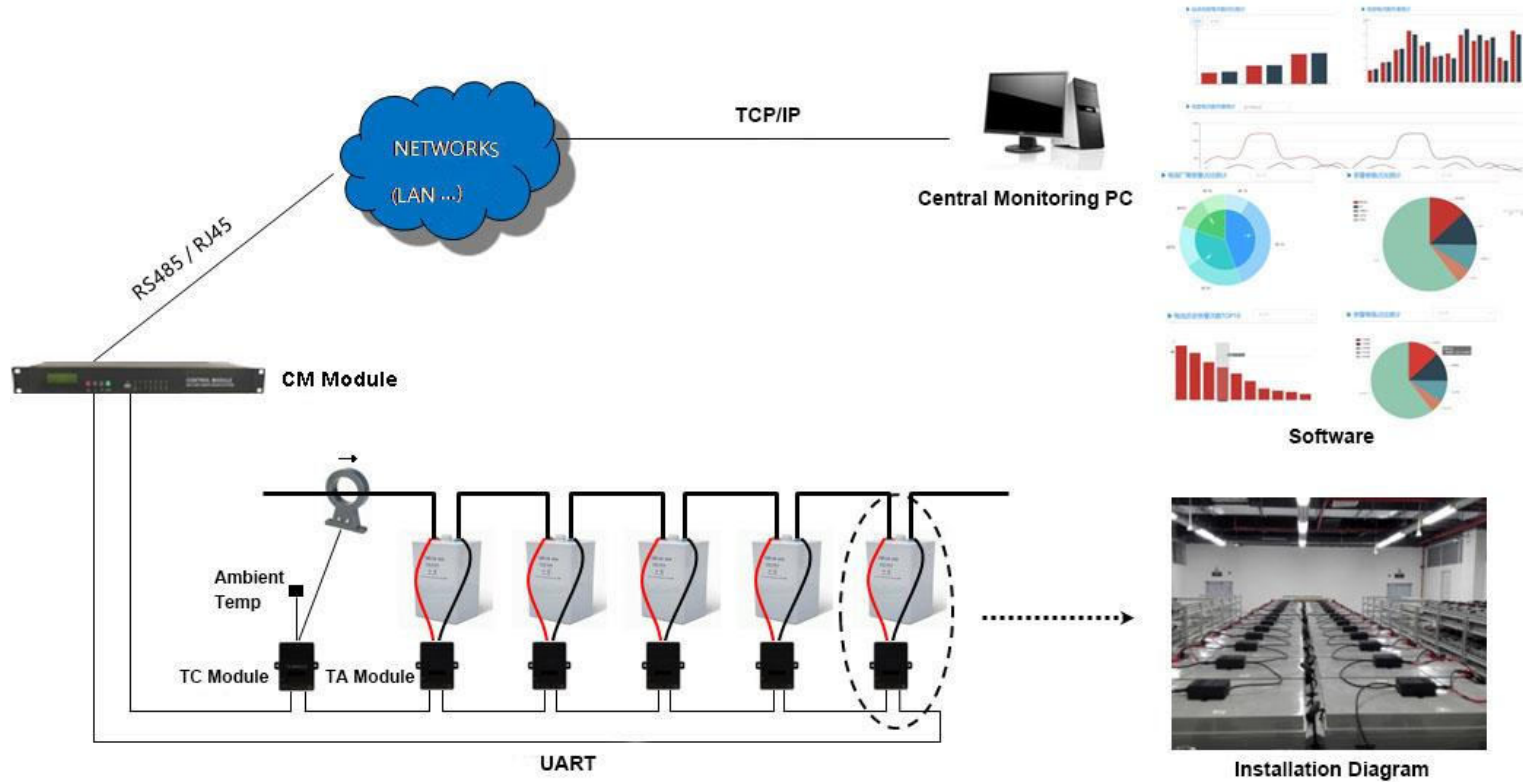


BMS of Company



BMS of Financial System

Topology



System components

CM-02N control module



- Max. manage 6 strings or 600 cells
- Data collection, analysis, storage, upload, display
- Support serial/LAN port communication, MODBUS/SNMP protocol
- Built-in HMI
- Built-in SOC/SOH algorithm
- Linkage dry contact output

H3G-TA module



- Distributed architecture, each battery needs 1 unit
- For monitoring cell voltage/ internal resistance/ temperature
- Power consumption current as low as 3mA, far below industry level
- Suitable for 1.2V/ 2V/ 6V/ 12V batteries
- Dual UART communication, MODBUS protocol
- Strong expandability and stable reliability

TC module



- Distributed architecture, each string needs 1 unit
- For monitoring battery string charge/discharge current/ambient temperature
- Support 1.2V/ 2V/ 6V/ 12V batteries
- Strong expandability and stable reliability



Charge/discharge current transformer

- Open Hall sensor
- Work with TC module to monitor battery string charge/discharge current



MM-07 Monitoring module (optional)

- Industrial 7-inch capacitive touch screen with built-in APP
- Support local display control extension



BMDM software (optional)

- Real-time data display, data AI analysis
- Cloud management
- Based on Linux system MySQL database

Main function

Item	Description
Monitoring content	SOC, SOH, cell internal resistance, cell temperature, cell voltage, string voltage, ambient temperature, charge/discharge current; the system has built-in self-developed advanced algorithm model
Charge/discharge process record	Intelligently identify the state of the battery string and automatically record the charge/discharge curves of the whole string and each battery
Over-limit alarm	Automatic limit alarm, buzzer start, alarm indicator closed, alarm status set, alarm dry contact closed or open, alarm threshold can be set
Dry contact	Two alarm dry contact output, divided into battery type alarm and device's own fault alarm, one dry contact input, dry contact can be defined
LCD display/keys	With two lines English display and operation buttons, can extend 7 -inch touch screen
Upload port	RS485, LAN
Communication protocol	MODBUS /RTU, MODBUS /TCP,SNMP

Technical specification

Monitoring content	Range	Accuracy	Resolution
String voltage	20 ~ 800V	±0.5%	0.1V
Cell voltage	1.2V, 2V, 6V, 12V batteries	±0.1%	0.001V
Cell internal resistance	50 ~ 65535μΩ	±2%	1μΩ
Cell temperature	-5 ~ +99.9°C	±1°C	0.1°C
Charge/discharge current	0 ~ 1000A (standard)	±1%	0.1A
Ambient temperature	-5 ~ +99.9°C	±1°C	0.1°C
SOC, SOH	—	±5%	—

IV. Features

All cables and non-metallic enclosures of the system are flame-retardant materials, and the flame-retardant meet the requirements specified in the American UL VW-1, UL94-V0 or GB / T 18380.1 standards.



TA test cable



Communication cable



TC test cable



Power cable

Installation



Terminal installation



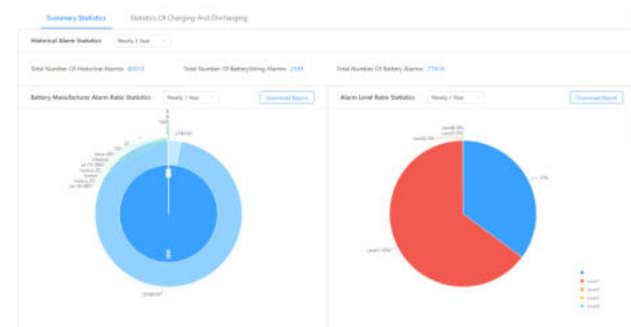
Control module installation



Sensor installation

BMDM-ND03 Software

- Visual user terminal, can display all battery data and change trend
- Visually reflect alarm conditions, including start and end times



UL, CE, ROHS, Tell Certifications

CERTIFICATE OF COMPLIANCE

Certificate Number: 2017 01-18 E188717
 Report Reference: E188717 0100-040001A
 Issue Date: 2017-01-18

Issued to: Hangzhou Huike Jada Technology Co., Ltd.
Appliment Company: No. 16, 16th Xiyuan Road, West Lake Technology Park Hangzhou, CN Zhejiang, CN 310000 Hangzhou, China

Listed Company: Same as Applicant

This is to certify that representative samples of Safety Monitor System
 KMG TA

Have been investigated by UL in accordance with the Standards indicated on this Certificate.

Standard(s) for Safety: UL 81810-1, 3rd Edition, May 11, 2013, Revised July 10, 2015, CAN/CSA-C22.2 No. 81810-1-13, 3rd Edition, Revision dated July 2015

Additional Standards: CAN/CSA-C22.2 No. 81810-1, 3rd Edition, 2012-05, ELECTRICAL EQUIPMENT FOR MEASUREMENT, CONTROL, AND LABORATORY USE, Part 1 General Requirements

Additional Information: UL 81810-1 ELECTRICAL EQUIPMENT FOR MEASUREMENT, CONTROL, AND LABORATORY USE, Part 1, General Requirements - 3rd Edition - Revision Date 2012-05-11
 See the UL Catalog Certification Directory at www.ul.com/certification for additional information.

Only those products bearing the UL Certification Mark should be considered as being covered by UL's Certification and Form(s) Service.

Look for the UL Certification Mark on the product.

This is to certify that representative samples of the product as specified on this Certificate were tested according to the current UL requirements.

UL

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SGS

VERIFICATION OF EMC COMPLIANCE

No.: 018M11482102611001
Applicant: Hangzhou Huike Jada Technology Co., Ltd.
 No. 16, 16th Xiyuan Road, West Lake Technology Park, Hangzhou, Zhejiang, China
Manufacturer: Hangzhou Huike Jada Technology Co., Ltd.
 No. 16, 16th Xiyuan Road, West Lake Technology Park, Hangzhou, Zhejiang, China
Product Description: Safety Monitoring System
Model No.: KMG
Technical Data: Not included by client
 Sufficient samples of the product have been tested and found to be in conformity with:
Test Standard: EN 61326-1:2008
Test Report Number(s): 018M11482102611001

This attestation of EMC Compliance has been prepared in the greatest degree of the accuracy of the tests, performed by independent SGS SPS Testing Services, based on the information provided. Use of the samples or the assessment of the product in such a way with the intention of misrepresenting compliance with the CE Marking is prohibited. The validity of this attestation is restricted to the conditions in annex 1 of this Certificate as listed.

CE

018M11482102611001
 Hangzhou Huike Jada Technology Co., Ltd.
 No. 16, 16th Xiyuan Road, West Lake Technology Park, Hangzhou, Zhejiang, China
 August 21, 2017

Member of SGS Group (Societe Generale de Constatation)

SGS PAPER 1144292

SGS

Verification Report

No.: 018M11482102611001 Date: 20 Aug 2017 Page: 1 of 20
 Hangzhou Huike Jada Technology Co., Ltd.
 No. 16, 16th Xiyuan Road, West Lake Technology Park, Hangzhou, Zhejiang, China

Sample Name: Safety Monitoring System
SGS Job No.: 018M11482102611001
Model No.: KMG
Date of Sample Received: 20 Aug 2017
Inspector Name: 018M11482102611001
Verifiable Regulation: EMC Directive 2014/53/EU (EMC) - marking 2014/53/EU
Verifiable Method: 1. Visual inspection of the samples identified from the submitted address and the related test reports submitted by the Applicant
 2. Tests were performed for the samples indicated by the phobos in the report with test methods referred to in IEC 61326-1:2008. Procedures for the determination of Levels of the Regulated Substances in Electrochemical Products
 (1) Sampling by XRF Spectrometry
 (2) Wet Chemistry Test Method
 3. Determination of Lead, A, Cadmium, Cr, or Ni
 4. Determination of Mercury by ICP
 5. Determination of Hexavalent Chromium by Spot test or Colorimetric Method
 6. Determination of PBBs and PBDEs by GC/MS
 Please refer to test report.

Verification Result: Based on the results of previous reports and certification details of the submitted samples, the results of visual inspection, qualitative, independent chemical, Polymerization Inhibition (PBI), Programmable Read Only Memory (PROM) checks and the British Standard BS EN 61326-1:2008 (EMC) test results.

Notes: The test results are related only to the tested items. The report shall not be interpreted as proof of full approval of the testing laboratory.

SGS

SGS 1144292

杭州华鼎加达网络科技有限公司


CNAS 中国合格评定国家认可委员会
MA 检验检测机构资质认定
 证书编号: B17018RS-EMC

检验报告

检验类别: 委托检验
 产品名称: 雷电监测系统
 产品型号: KMG
 受检单位: 杭州华鼎加达网络科技有限公司
 检验日期: 2017年12月04日-2017年12月06日

中国赛尔实验室

Thank you!

 Customer First