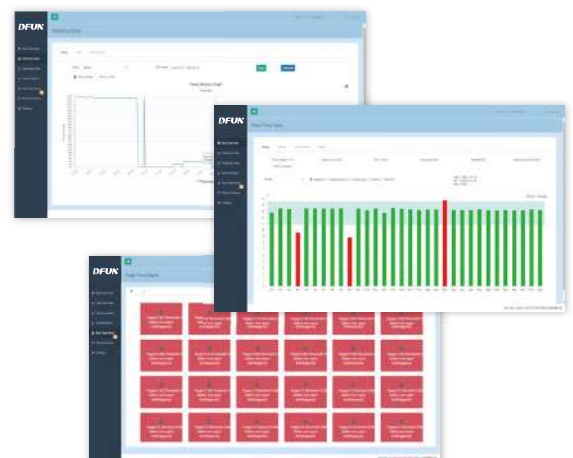


- 
-  **UL Certified**
 -  **4G Wireless Upload**
 -  **Build-in Webpage**
 -  **5 Years Storage**
 -  **Real-time Alarm**
 -  **Ripple Current / Ripple Voltage**

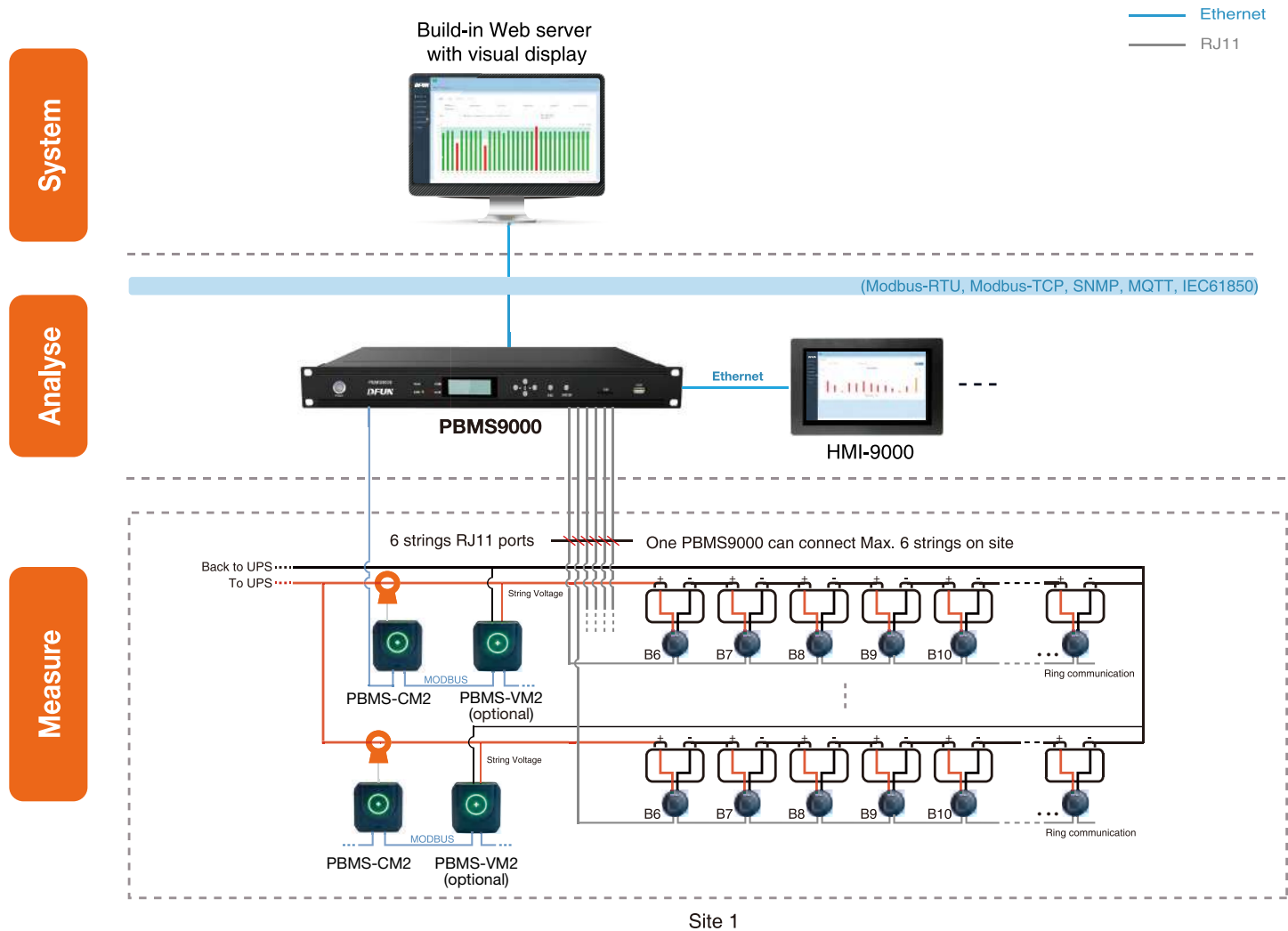
Feature

- Apply to UPS and data center application
- Measure lead-acid or multi-pole battery
- Ring communication, any communication failure will not affect other sensors communication
- Monitor battery voltage, current, impedance, insulation resistance, ripple current & voltage, SOC, SOH, etc.
- Support Modbus, SNMP, MQTT and IEC61850 protocols
- Auto-sensing for the battery sensor's ID address
- Dual-source to avoid power shutdown
- Anti-interference design, support to connect with high-frequency UPS
- Comply with IEEE 1188-2005
- Thermal runaway management(Optional temperature and humidity sensor)
- The product has obtained CE, FCC, Rohs, UL certification



PBMS9000 for Data Center

System Structure



Management Layer

PBMS9000 Battery Management Controller

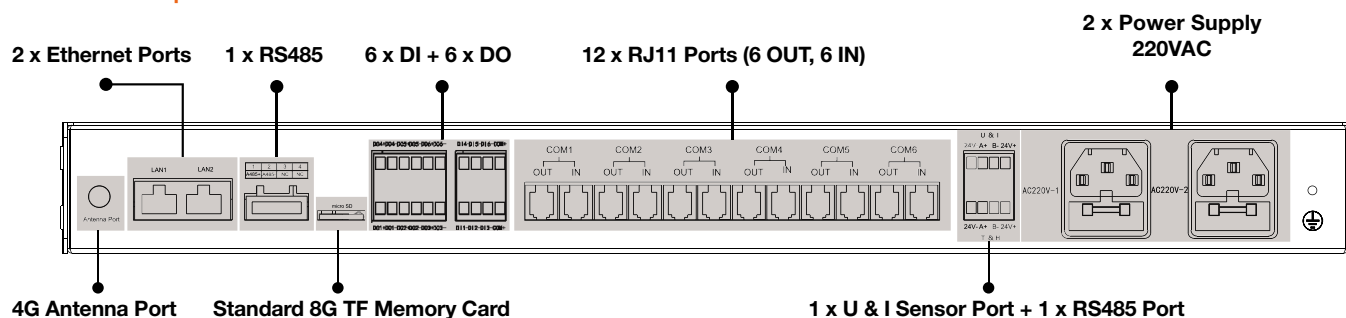
- Standard 1 U design for distribution cabinet
- Dual-source to avoid power shutdown
- Built-in web server with visual display
- Monitor Max. 6 strings battery, in a total of 480 batteries
- Measure battery string current & voltage, ripple voltage & current, charge & discharge current, internal temperature, impedance, insulation resistance, ambient temperature & humidity, SOC and SOH
- Alarm message by SMS or Email
- Support Modbus-TCP, Modbus-RTU, SNMP and IEC61850 protocols
- Support MQTT for JSON format to data upload
- 1 RS485 port, 2 Ethernet ports and 1 4G Antenna port to data upload
- 6 DI ports (digital Input connecting)
- 6 DO ports (sound and light alarm)



Pre-install & Pre-wiring for PBMS9000 and HMI-9000 (optional)



Interface Description



Technical Specification

CPU	ARM cortex-A7 528MHz	Up-link Communication	2 Ethernet ports (10/100M), MODBUS-TCP, SNMP, IEC61850 1 RS485 port, MODBUS-RTU, baudrate: 9600bps, 19200bps, 38400bps (optional)	
Memory	512MB flash, 4G EMMC + 8G TF memory card			
Display	2-inch LCD with backlight	Down-link Communication	6 Channels RJ11 ports, each port Max. connect ≤ 80pcs batteries, total Max. 480pcs	
MTBF	≥100,000 hours			
Power Supply	Rated: 220VAC Range: 85~264VAC / 120~370VDC	Measure Range	Voltage	1~6 strings, Range: 20~1000VDC (±0.5%), Resolution:0.01V
			Ripple Voltage	1~6 strings, Range: 2~100V (peak), Resolution: 0.01V
Dimension	Standard 19-inch 1 U device 483mm × 206mm × 44.5mm (W*D*H) Open hole: 440mm×46mm (L*H)		Current	1~6 strings, Range: -2000~2000ADC (±2.0%fs, 15°C~35°C), Resolution:0.01A
			Ripple Current	1~6 strings, determined by the Hall rated measuring current I, Range: 0~0.4*I (peak), Resolution:0.01A
Power Consumption	<15W (only main controller)			
Additional Port	6 x DI dry contact 6 x DO relay output, 250VAC/5A or 30VDC/5A	Operation Environment	Operating Temperature: -15~60°C Storage Temperature: -40~70°C Humidity: 10~95%RH, non-condensing	
		Extension Sensor (optional)	- RS485 for Max. 6 strings ambient temperature & humidity measuring - RS485 for 1~6 strings DC insulation resistance measuring	

String Measuring Sensor

PBMS-CM2 String Current Measuring Sensor & Hall Sensor

- 1 string needs 1 PBMS-CM2, each PBMS-CM2 with 2 hall sensor ports
- Measure battery string charge and discharge current, ripple current
- Hall sensor measuring range: -1000A~+1000A(single-pole) / -2000A~+2000A(dual-pole)
- Supports floating charge hall detection



Hall sensor



Item	Power Supply	Hall Interface	Environment
PBMS-CM2	24VDC (range: 9~32VDC) Power consumption: <0.5W	2 channels, DC ±4V	-10°C ~ +55°C , accuracy: ±1°C

PBMS9000 for Data Center

Battery Cell Sensor

PBAT61-02/PBAT61-06/PBAT61-12 Battery Cell Sensor

- PBAT61-02 for 2V battery, PBAT61-06 for 6V battery, PBAT61-12 for 12V battery
- Monitor individual battery voltage, internal temperature (negative pole), Impedance(ohmic value)
- Auto-balancing



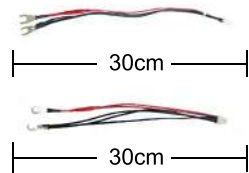
Running Status



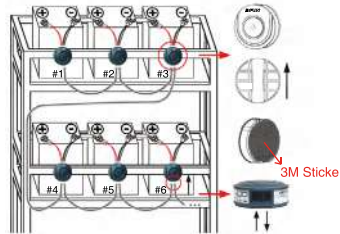
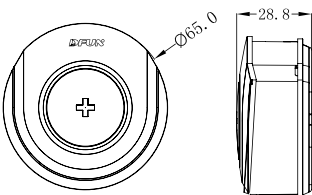
Abnormal Status

Item	Rated Input Voltage	Measuring Range			
		Voltage	Internal Temperature	Impedance	Power Consumption
PBAT61-02	02V	1.6~2.6V ($\pm 0.2\%$)	$-20^{\circ}\text{C} \sim 85^{\circ}\text{C}$ ($\pm 1.0^{\circ}\text{C}$)	Range: 0.1~50m Ω Repeatability accuracy: 1.0% $\pm 25\mu\Omega$ Consistency accuracy: 1.5% $\pm 25\mu\Omega$	Running: <70mW Sleeping: <8mW
PBAT61-06	06V	4.8~10V ($\pm 0.2\%$)			
PBAT61-12	12V	7.5~15.6V ($\pm 0.2\%$)			

Dimension and Installation



Item	Description
	Length
Terminal & Size	U type, hole diameter: 8mm
	O type, hole diameter: 8mm



Extension Sensor (Optional)



Ambient Temperature & Humidity Sensor

- Dual RJ45 interface, fast wiring, support cascade use
- Adsorption by magnet
- Temperature: $-20^{\circ}\text{C} \sim 60^{\circ}\text{C}$ ($\pm 0.4^{\circ}\text{C}$), resolution: 0.1 $^{\circ}\text{C}$. Humidity: 0 ~ 100%RH ($\pm 3\%$ RH), resolution: 0.1%RH
- Cable(9000-H-THD-RJ45-500): 5 meter RJ45 convert to 4P terminal wire



Hydrogen (H₂) Sensor

- Class of protection: IP65
- 10~30VDC, power consumption: 0.9W
- Communication: RS485, Modbus
- Measuring range: 0~1000ppm
- Accuracy: $\pm 5\%$ FS
- Resolution: 1ppm(100K Ω ~50K Ω)
- Cable: 2 meter Aviation port to 4P terminal wire



PBMS-VM2 String Voltage Measuring Sensor

- 1 PBMS-VM2 can measure 1 string's voltage
- Measure battery string voltage and ripple voltage
- Built-in ground fault detection & testing



DC Leakage Current Sensor

- Monitoring string leakage current to prevent fire caused
- Measurement accuracy: $\pm 1\%$ FS
- Cable: 2 meter hall sensor port to 4P terminal wire

Order Information

System Structure		Model	Description	Remark
Management Layer	BMS Main Controller	PBMS9000	Battery monitoring system main controller	One per UPS One PBMS9000 can monitor Max.6 battery strings (Max.480 batteries)
		PBMS9000-V1-1P	48VDC Operation Single Power Supply Input	
		PBMS9000-L	Battery monitoring system main controller with 4G antenna port	
		PBMS9000-V1-1P-L	48VDC Operation,Single Power Supply Input, with 4G antenna port	
	Protocol(optional)	PBMS9000-CP	DFUN standard IEC61850 model available. For customized needs, please contact our sales team.	
String Measuring Sensor		PBMS-CM2	String current measuring sensor	Each has 2 hall sensor ports,one or two PBMS-CM2 per string Hall sensor cable: 2m cable Communication cable: 5m with RJ45 port
		PBMS-VM2	String voltage measuring sensor	One per string (optional)
Battery Cell Sensor		PBAT 61-02	02V battery cell sensor	One per battery cell
		PBAT 61-06	06V battery cell sensor	One per battery cell
		PBAT 61-12	12V battery cell sensor	One per battery cell
Accessory	Cell Sensor Communication Cable	PBAT-COM-40	Cable terminal: RJ11 port, length: 40cm (standard)	
		PBAT-COM-70	Cable terminal: RJ11 port, length: 70cm	
	Battery Measuring Cable	PBAT-C1-U-M8-30	Cable terminal: U type  , hole diameter: 8mm, length: 30cm (standard)	
		PBAT-C1-O-M8-30	Cable terminal: O type  , hole diameter: 8mm, length: 30cm	
	Hall Sensor for PBMS-CM2	DXEEK03-50A-V4	Rated input: 50A	Measure Range: -50A~+50A, Φ20mm
		DXEEK03-100A-V4	Rated input: 100A	Measure Range: -100A~+100A, Φ20mm
		DXEEK05-25A-V4	Rated input: 25A	Measure Range: -25A~+25A, Φ40mm
		DXEEK05-200A-V4	Rated input: 200A	Measure Range: -200A~+200A, Φ40mm
		DXEEK05-300A-V4	Rated input:300A	Measure Range: -300A~+300A, Φ40mm
		DXEEK05-400A-V4	Rated input: 400A	Measure Range: -400A~+400A, Φ40mm
		DXEEK05-500A-V4	Rated input: 500A	Measure Range: -500A~+500A, Φ40mm
		DXEEK05-600A-V4	Rated input: 600A	Measure Range: -600A~+600A, Φ40mm
		DXEEK05-800A-V4	Rated input: 800A	Measure Range: -800A~+800A, Φ40mm
	DXEEK05-1000A-V4	Rated input: 1000A	Measure Range: -1000A~+1000A, Φ40mm	
Optional Module	HMI for Local Display & Operation	HMI-9000	10-inch touch-screen HMI for local display & operation	One per six (max) PBMS9000 Communication with PBMS9000 via Ethernet
		HDR-30-12	12VDC power coverter (220VAC to 12VDC)	If selected HMI-PBMS9000, then must select power supply converter
	DC Leakage Current Sensor	STL8S-MT2-300mA-DF	Rated input: ±300mA	Measure Range:-360mA~+360mA, Φ72mm
	Ambient Temperature & Humidity	H-THDRJ45	Temperature: -20°C ~ 60°C (±0.4°C) Humidity: 0 ~ 100%RH (±3%RH)	1 PBMS9000 can connctet Max. 6pcs
	Hydrogen (H2) Sensor	PBMS-H2	Measuring Range: 0~1000ppm	One per one PBMS9000
	Cabinet for Prewiring In Factory	PBMS-BOX-260	Dimension: 535*260*335mm (W*H*D)	Pre-install & pre-wiring for PBMS9000 and HMI-9000
		PBMS-BOX-730	Dimension: 535*730*335mm (W*H*D)	Pre-install & pre-wiring for Max.4 PBMS9000 and one HMI-9000
Ethernet Switch	IES318	1. Power supply 24VDC 12~48VDC 2. 8 x 10/100M Ethernet ports	If selected PBAT-BOX-730, then must select IES318	

Note: If battery terminal is M5, M6, M10, M12, M16, please contact our sales for customize requirements before placing the order.

Order Information

System Structure		Model	Description	Remark
Management Layer	BMS Main Controller	PBMS9000Pro-V1	Battery Management Controller, 48VDC power supply	One per UPS One PBMS9000Pro can monitor Max.6 battery strings (Max.100 batteries)
		PBMS9000Pro-V1-L	Battery Management Controller, 48VDC power supply with 4G	
		PBMS9000Pro-V2	Battery Management Controller, 220VAC power supply	One per UPS One PBMS9000Pro can monitor Max.6 battery strings (Max.420 batteries)
		PBMS9000Pro-V2-L	Battery Management Controller, 220VAC power supply with 4G	
		PBMS9000Pro-V3	Battery Management Controller, 110VDC power supply	One per UPS One PBMS9000Pro can monitor Max.6 battery strings (Max.216 batteries)
		PBMS9000Pro-V3-L	Battery Management Controller, 110VDC power supply with 4G	
	Protocol(optional)	PBMS9000Pro-CP	DFUN standard IEC61850 model available. For customized needs, please contact our sales team.	
String Measuring Sensor		PBMS-CM2	String current measuring sensor	Each has 2 hall sensor ports, one or two PBMS-CM2 per string Hall sensor cable: 2m cable Communication cable: 5m with RJ45 port
		PBMS-VM2	String voltage measuring sensor	One per each string (optional)
Battery Cell Sensor		PBAT 71-02	02V / 1.2V battery cell sensor	One per battery cell
		PBAT 71-12	12V battery cell sensor	One per battery cell
Accessory	Cell Sensor Communication Cable	PBAT-COM-RJ45-20	Cable terminal: RJ45 port, length: 20cm	
		PBAT-COM-RJ45-50	Cable terminal: RJ45 port, length: 50cm (standard)	
	Battery Measuring Cable	PBAT-C1-U-M8-30	Cable terminal: U type  , hole diameter: 8mm, length: 30cm (standard)	
		PBAT-C1-O-M8-30	Cable terminal: O type  , hole diameter: 8mm, length: 30cm	
	Hall Sensor for PBMS-CM2	DXEEK03-50A-V4	Rated input: 50A	Measure Range: -50A~+50A, Φ20mm
		DXEEK03-100A-V4	Rated input: 100A	Measure Range: -100A~+100A, Φ20mm
		DXEEK05-25A-V4	Rated input: 25A	Measure Range: -25A~+25A, Φ40mm
		DXEEK05-200A-V4	Rated input: 200A	Measure Range: -200A~+200A, Φ40mm
		DXEEK05-300A-V4	Rated input:300A	Measure Range: -300A~+300A, Φ40mm
		DXEEK05-400A-V4	Rated input: 400A	Measure Range: -400A~+400A, Φ40mm
		DXEEK05-500A-V4	Rated input: 500A	Measure Range: -500A~+500A, Φ40mm
		DXEEK05-600A-V4	Rated input: 600A	Measure Range: -600A~+600A, Φ40mm
		DXEEK05-800A-V4	Rated input: 800A	Measure Range: -800A~+800A, Φ40mm
		DXEEK05-1000A-V4	Rated input: 1000A	Measure Range: -1000A~+1000A, Φ40mm
Optional Module	HMI for Local Display & Operation	HMI-9000Pro	10-inch touch-screen HMI for local display & operation	Power Supply from Auxiliary power module
	Auxiliary Power Module (choose one out of three)	HDR-30-12	220V AC to 12V DC power supply	Provide power supply for the HMI-9000Pro
		DDR-15L-12	48V DC to 12V DC power supply	
		RSD-30H-12	110V DC to 12V DC power supply	
	DC Leakage Current Sensor	STL8S-MT2-300mA-DF	Rated input: ±300mA	Measure range: -360mA~+360mA, Φ72mm
	Ambient Temperature & Humidity	H-THDRJ45	Temperature: -20~60°C (±0.4°C) Humidity: 0 ~ 100%RH (±3%RH)	1 PBMS9000Pro can connctet Max. 6pcs
	Hydrogen (H2) Sensor	PBMS-H2	Measuring range: 0 ~ 1000ppm	One per one PBMS9000Pro
	Liquid Level Sensor	PBMS-ELS	Monitor liquid level, for transparent battery	One per battery, length: 30cm
		PBMS-Y29	Monitor liquid level, for non-transparent battery	One per battery, length: 50cm
	Leakage Sensor	PBMS-LS-O35	Monitor leakage with two ports (connect to the battery +/- port)	One/Two per each battery, length: 30cm Hole diameter: 35mm
		PBMS-LS-O41	Monitor leakage with two ports (connect to the battery +/- port)	One/Two per each battery, length: 30cm Hole diameter: 41mm
	Cabinet for Prewiring In Factory	PBMS-BOX-260	Dimension: 535*260*335mm (W*H*D)	Pre-install & pre-wiring for PBMS9000Pro and HMI-9000Pro
		PBMS-BOX-730	Dimension: 535*730*335mm (W*H*D)	Pre-install & pre-wiring for Max.4 PBMS9000Pro and one HMI-9000Pro
	Ethernet Switch	IES318	1. Power supply 24VDC 12~48VDC 2. 8 x 10/100M Ethernet ports	If selected PBAT-BOX-730, then must select IES318

Note: If battery terminal is M5, M6, M10, M12, M16, please contact our sales for customize requirements before placing the order.