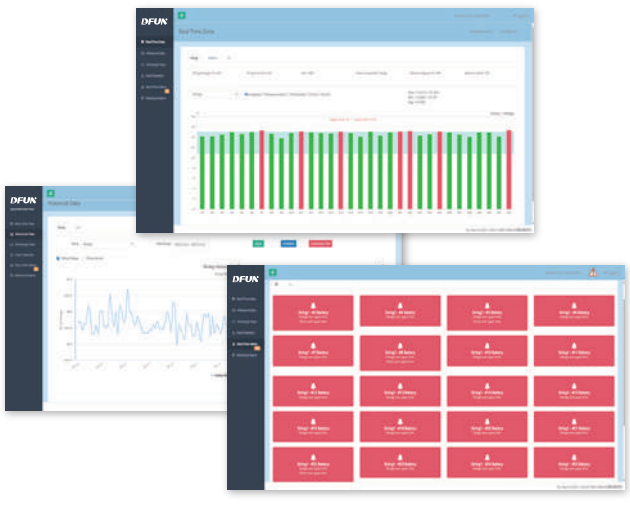
PBAT-Gate

Battery Monitoring Solution



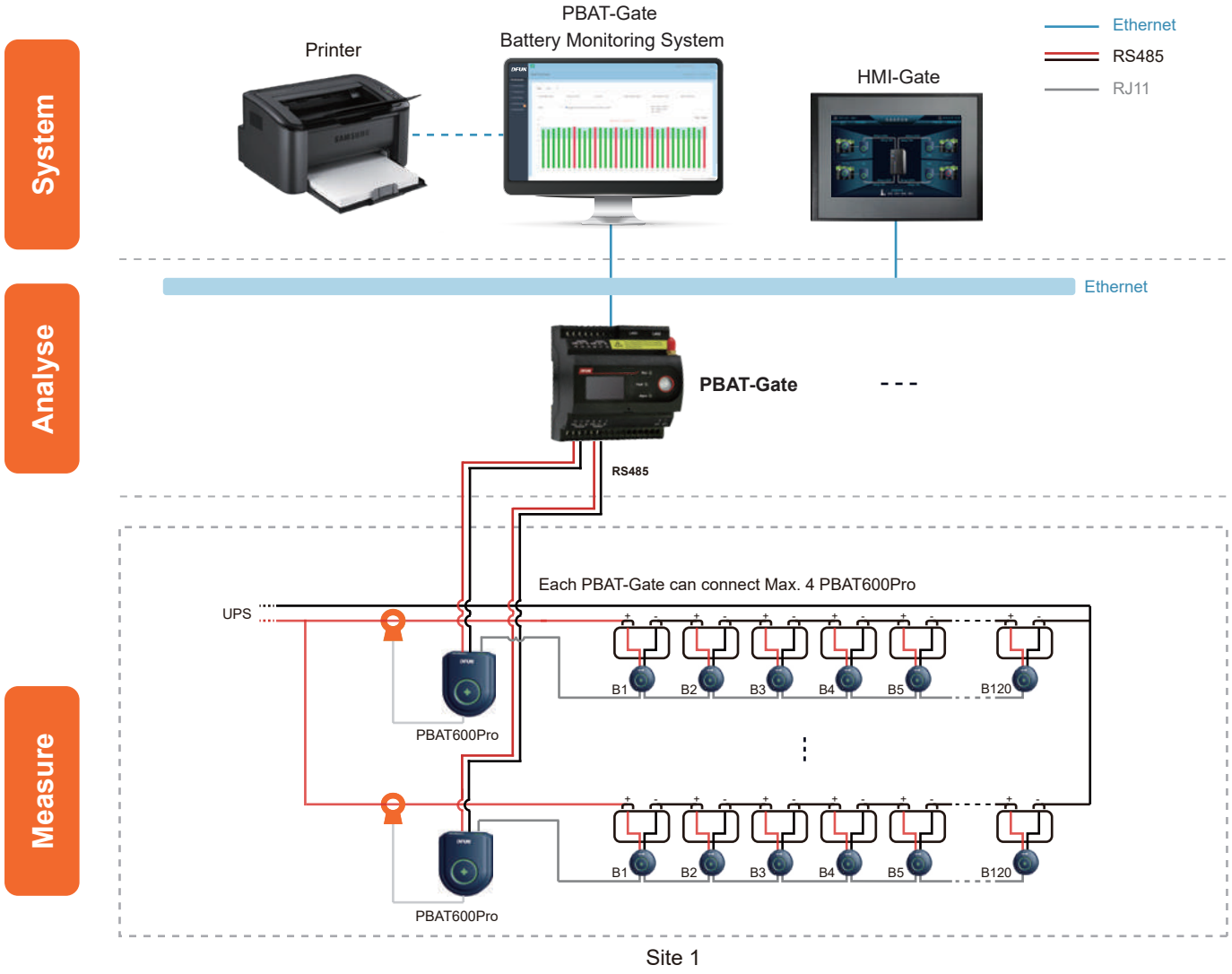
Feature

- 24/7 hours on-line monitoring & remote alarms notification
- Suitable for UPS and data center application
- Anti-interference design, support to connect with high-frequency UPS
- Build-in web server with visual display
- Auto-sensing for the battery sensor's ID address
- Multi-communication protocol (MODBUS-TCP, SNMP)
- Support 4G sending SMS alarm or wireless upload to cloud
- Comply with IEEE 1188-2005



PBAT-Gate Battery Monitoring Solution

System Structure



Site 1

Management Layer

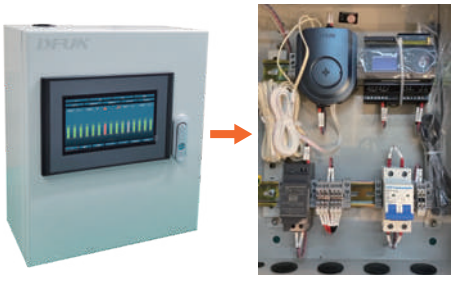
PBAT-Gate Battery Monitoring Gateway

- Real-time monitoring 1 set UPS with Max. 480 batteries
- Data logging for all measuring data for 12 months
- Build-in web server with bar chart and trend curve analysis for voltage, charge and discharge current, internal temperature, impedance
- Report for battery string voltage & current, individual battery voltage, temperature, impedance, support export PDF, CSV etc. document
- Setpoint alarm for cell voltage, internal temperature, impedance, SOC, SOH (upper limit / lower limit) and string voltage, current, SOC (upper limit / lower limit)
- 2 AI ports for ambient temperature & humidity sensor (optional), 1 DO port for sound and light alarm (optional), 4DI ports for digital input connecting (optional)
- Support SNMP, Modbus TCP protocol
- Support RESTful API, JSON, XML format
- Support SMS/Email alarm
- Support 4G data upload to the 3rd party



PBAT-Gate

All-in-one



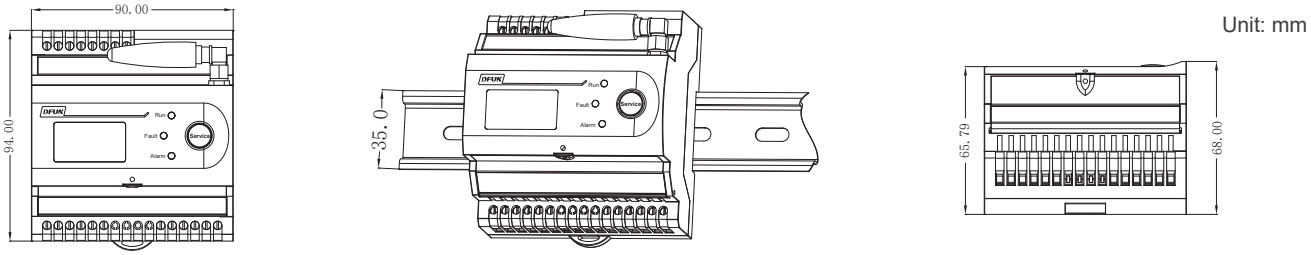
Pre-install & pre-wiring for PBAT-Gate, PBAT600Pro and HMI-Gate (optional)

PBAT-Gate Battery Monitoring Solution

Technical Specification

CPU	ARM cortex-A8 800MHz	Dimension	90mm x 94mm x 68mm	
Memory	512MB flash, 8G TF memory card	Operating system	Embedded linux	
Flash	Nand flash 512MB	Communication	4CL	4 RS485 serial ports, 2 Ethernet ports
MTBF	≥ 50,000 hours		2ZL	2 RS485 serial ports, 2 Ethernet ports
Display	OLED	Power consumption	< 5W	
Weight	650g	Optional function	4 DI, 2 AI, 1 DO (only for PBAT-GATE-2ZL)	
Baudrate	1200 ~ 115200bps	Operation temperature	-15°C ~ 55°C	
Power supply	18 ~ 36VDC	Operation humidity	10% ~ 95% Non-condensing	

Dimension and Installation



Battery String Sensor

PBAT600Pro Battery String Sensor

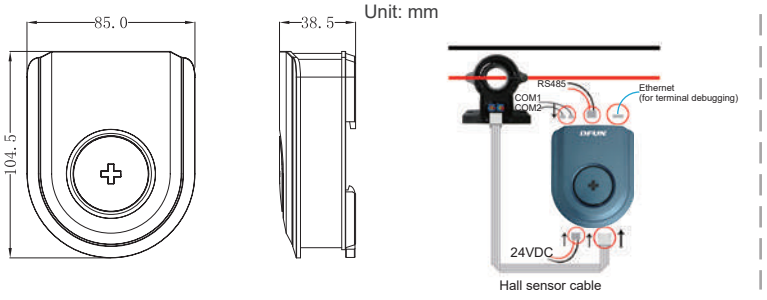
- Monitor battery string voltage, charge and discharge current
- Calculate battery status of charge (SOC)
- Auto-balancing
- Data acquisition
- Auto-sensing for whole battery string sensor's ID address
- Accessories:
  1) Hall sensor and cable: range from 0 ~ ±1000A with 2m cable
  2) Communication cable : 5m with RJ11 port



Running status | Alarm status | Hall sensor

Item	Measuring range		External power supply	Power consumption
	Voltage	String current		
PBAT600Pro	0 ~ 800VDC (±0.5%)	-1000 ~ 1000A by hall sensor (±2.0%)	12 ~ 36VDC	1W

➢ Dimension and Installation





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



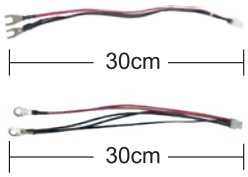
Running status



Abnormal status

Item	Rated input voltage	Measuring range			
		Voltage	Internal temperature	Impedance	Power consumption
PBAT61-02	02V	1.6 ~ 2.6V (±0.2%)	-20°C ~ 85°C (±0.5%)	Range: 0.1mΩ~50mΩ Repeatability error: 1.0%±25μΩ Conformity error: 1.5%±25μΩ	Running: <110mW Sleeping: <12mW
PBAT61-06	06V	4.8 ~ 10V (±0.2%)			Running: <90mW Sleeping: <10mW
PBAT61-12	12V	7.5 ~ 15.6V (±0.2%)			Running: <90mW Sleeping: <10mW

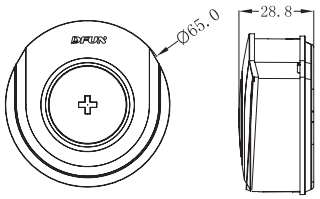
➢ Dimension and Installation

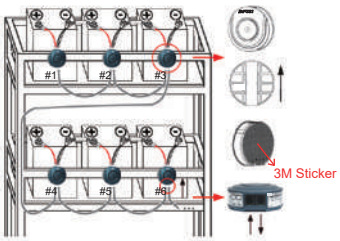


Battery measuring cable	Item	Description
	Length	30cm
	Terminal & Size	U type, hole diameter: 8mm
		O type, hole diameter: 8mm











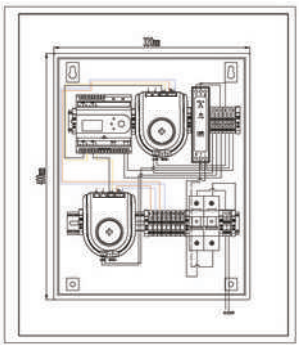


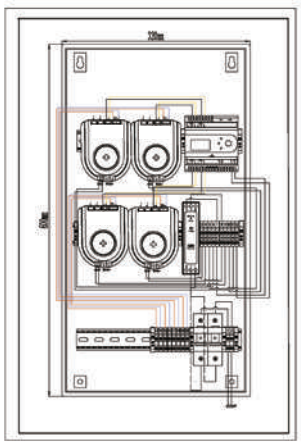
Cabinet for Pre-wiring in Factory

PBAT-BOX

- Pre-install & pre-wiring for PBAT-Gate, PBAT600Pro and power supply converter inside
- Pre-mount HMI-Gate if selected
- Provide wiring drawing

Hardware		
Dimension	For 1 ~ 2 battery strings	**PBAT-BOX-400:** 400*320*138.5mm (H*W*D)
	For 3 ~ 4 battery strings	**PBAT-BOX-600:** 600*320*138.5mm (H*W*D)
Installation	Wall-mount, hang on the battery rack	
Material	Steel plate, with rock	


PBAT-BOX-400


PBAT-BOX-600

Local Display & Operation (Optional)

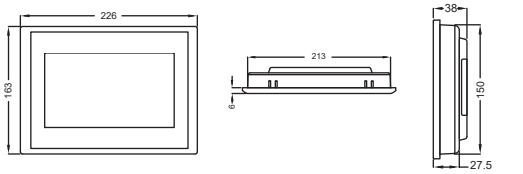
HMI-Gate

- 7-inch touch-screen HMI for display and operation
- **Real-time data inquiry:**
  1) Individual battery voltage, impedance, inner temperature, SOC, SOH
  2) String voltage, charge and discharge current, SOC, balance degree
- **Alarm data inquiry:**
  1) Real-time alarm status and related alarm information (faulty battery ID, date/time, alarm reason, communication status, etc.)
  2) 3000 alarm records for each string battery



HMI-Gate

Unit : mm



Order Information

System structure		Model	Description	Remark
Management layer		PBAT-GATE-4CL	Battery monitoring gateway with 4 RS485 ports, SMS/Email alarm, 4G data upload	One per UPS Max. 4 strings × 120 batteries = 480 batteries
		PBAT-GATE-2ZL	Battery monitoring gateway with 2 RS485 ports, 4DI, 2AI, 1DO, SMS/Email alarm, 4G data upload	One per UPS Max. 2 strings × 120 batteries = 240 batteries
Battery string sensor		PBAT600Pro	Battery string sensor	One per string 1 RS485 port, one PBAT600Pro can connect Max. 120pcs PBAT61 series battery sensor, Max. 2 Hall sensor and cable: range from 0 ~ ±1000A with 2m cable. Communication cable: 5m with RJ11 port
Battery cell sensor		PBAT61-02	02V battery cell sensor	One per battery cell
		PBAT61-06	06V battery cell sensor	One per battery cell
		PBAT61-12	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 PBAT600Pro	CS050EK1T5	Rated input: 50A	Measure range: 0 ~ ± 100A, Φ20mm
		CS100EK2T5	Rated input: 100A	Measure range: 0 ~ ± 200A, Φ40mm
		CS200EK2T5	Rated input: 200A	Measure range: 0 ~ ± 400A, Φ40mm
		CS400EK2T5	Rated input: 400A	Measure range: 0 ~ ± 800A, Φ40mm
		CS500EK2T5	Rated input: 500A	Measure range: 0 ~ ± 1000A, Φ40mm
	Power supply	HDR-30-24	24VDC power source, 220VAC to 24VDC	
Optional module	Local display & operation	HMI-Gate	7-inch HMI for local display	One per PBAT-Gate communication with PBAT-Gate via Ethernet
	Cabinet for pre-wiring in factory	PBAT-BOX-400	Dimension: 400*320*138.5mm (H*W*D)	Pre-install & pre-wiring for PBAT-Gate, PBAT600Pro and power supply converter, pre-mount HMI-Gate if customer selected
		PBAT-BOX-600	Dimension: 600*320*138.5mm (H*W*D)	

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Your Representative