

# PBAT-Gate for Small-scale Data Center



Build-in Webpage monitoring software



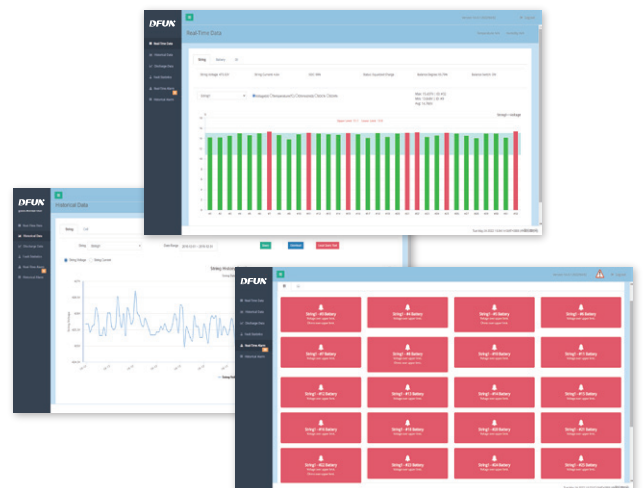
5 years history data storage



4G wireless upload to the third party

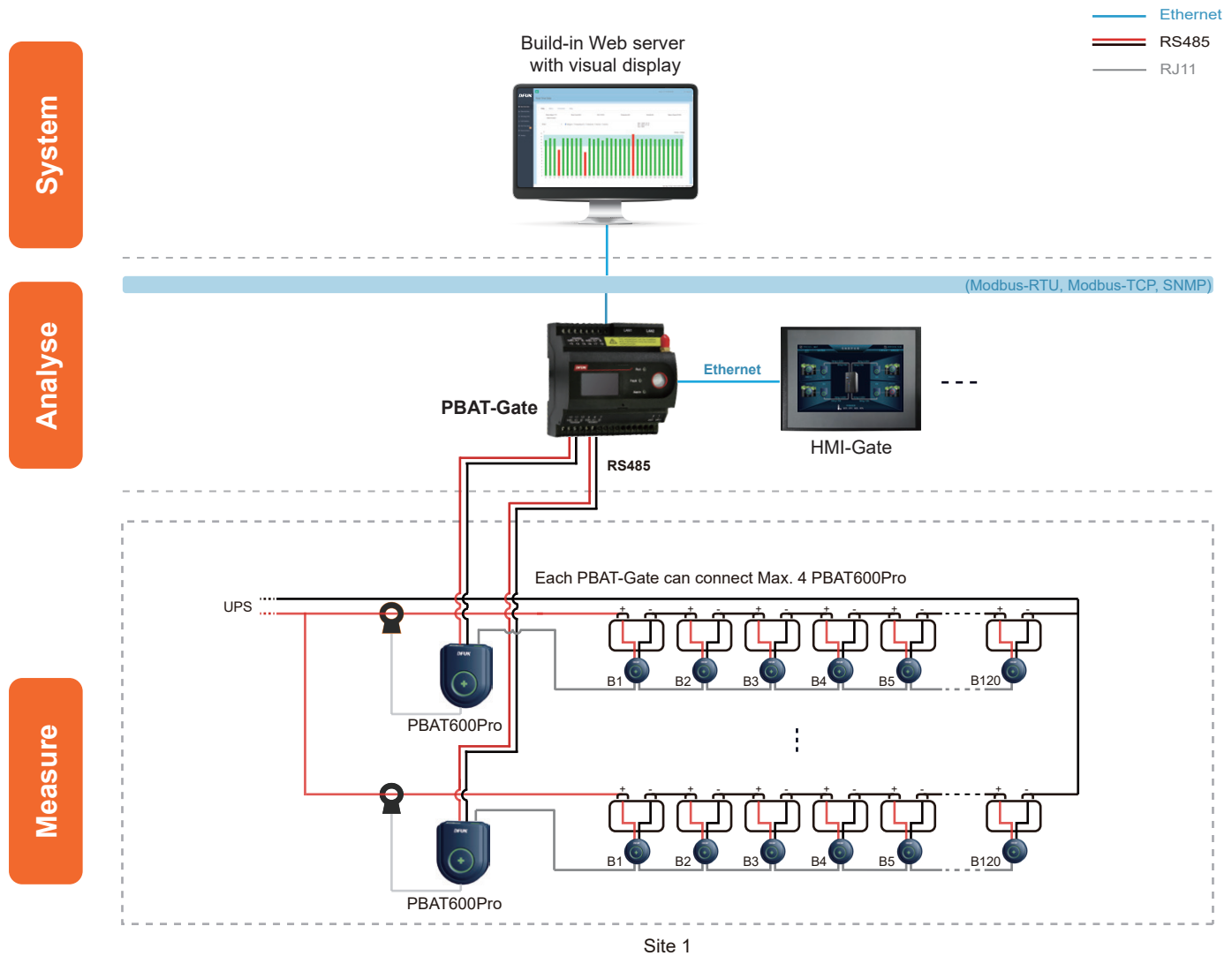
## Feature

- Apply to UPS and data center
- 24/7 hours on-line monitoring & remote alarms notification
- Monitor Max. 4 string, in total of 480 batteries
- Measure Lead-Acid battery
- Anti-interference design, support to connect with high-frequency UPS
- 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 for Small-scale Data Center

## System Structure



## Management Layer

### PBAT-Gate Battery Monitoring System Main Controller

- 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)
- Optional sensor for 2 AI ports for ambient temperature & humidity sensor, 1 DO port for sound and light alarm, 4DI ports for digital input connecting
- Support SNMP, Modbus TCP protocol
- Support HTTP protocol (RESTful API, JSON, XML format)
- Support SMS/Email alarm
- Support 4G data upload to the 3rd party



**PBAT-Gate**  
**All-in-one**



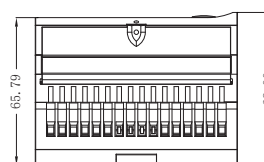
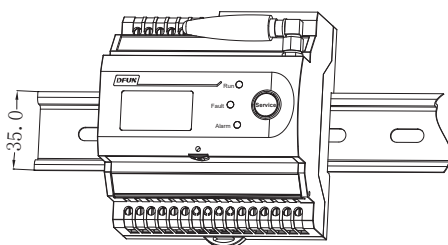
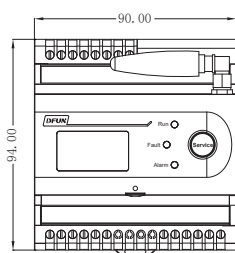
**Pre-install & pre-wiring for PBAT-Gate, PBAT600Pro and HMI-Gate (optional)**

# PBAT-Gate for Small-scale Data Center

## 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



Unit: mm

## Battery String Sensor

### PBAT600Pro Battery String Sensor

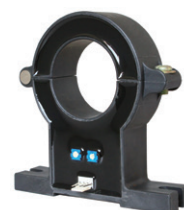
- Monitor battery string voltage, charge and discharge current
- Calculate battery status of charge (SOC)
- Auto-balancing
- Data acquisition
- Auto-sensing for whole battery string sensor's ID address
- Accessories:
  - 1) Hall sensor and cable: range from 0 ~ ±1000A with 2m cable
  - 2) Communication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



Running status



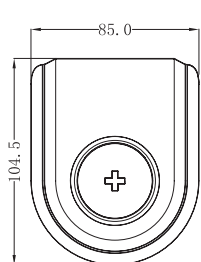
Alarm status



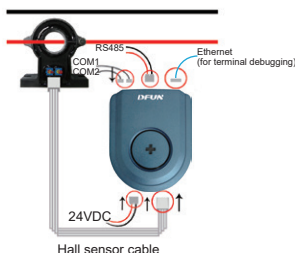
Hall sensor

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



Unit: mm



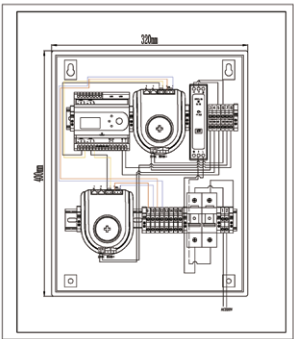
# PBAT-Gate for Small-scale Data Center

## Cabinet for Pre-wiring in Factory

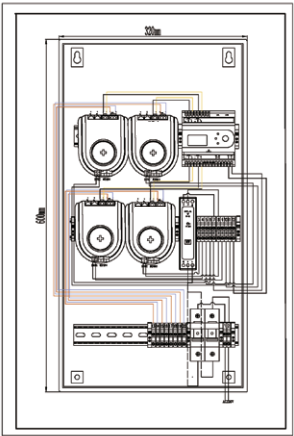
### PBAT-BOX

- 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	<b>PBAT-BOX-400:</b> 400*320*138.5mm (H*W*D)
	For 3 ~ 4 battery strings	<b>PBAT-BOX-600:</b> 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

## 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



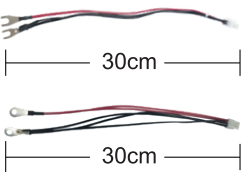
Running status



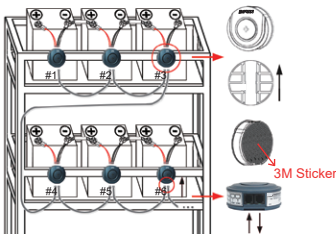
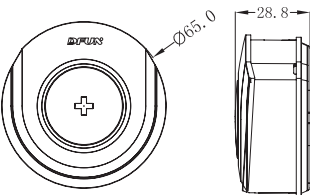
Abnormal status

Item	Rated input voltage	Measuring range			
		Voltage	Internal temperature	Impedance	Power consumption
PBAT61-02	02V	1.6 ~ 2.6V ( $\pm 0.2\%$ )	$-20^{\circ}\text{C} \sim 85^{\circ}\text{C} (\pm 0.5\%)$	Range: $0.1\text{m}\Omega \sim 50\text{m}\Omega$ Repeatability error: $1.0\% \pm 25\mu\Omega$ Conformity error: $1.5\% \pm 25\mu\Omega$	Running: $<110\text{mW}$ Sleeping: $<12\text{mW}$
PBAT61-06	06V	4.8 ~ 10V ( $\pm 0.2\%$ )			Running: $<90\text{mW}$ Sleeping: $<10\text{mW}$
PBAT61-12	12V	7.5 ~ 15.6V ( $\pm 0.2\%$ )			Running: $<90\text{mW}$ Sleeping: $<10\text{mW}$

### > Dimension and Installation



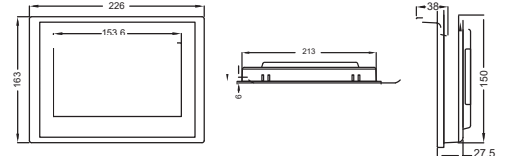
Battery measuring cable	Item	Description
	Length	30cm
	Terminal & Size	U type, hole diameter: 8mm O type, hole diameter: 8mm





# PBAT-Gate for Small-scale Data Center

## 7-inch Normal HMI (Optional)

- 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



## Order Information

System structure		Model	Description	Remark
Management layer		PBAT-GATE-4CL	Battery monitoring system main controller 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 system main controller 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	
		PBAT-C2-S	Small capacity battery measuring cable Includes connecting cables (11AWG, length: 20cm) and measuring cables (length: 10 + 20cm)	
	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
		CS300EK2T5	Rated input: 300A	Measure range: 0 ~ ± 600A, 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	HMI for local display & operation	HMI-Gate	7-inch touch-screen HMI for local display & operation	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)	