Model: BPA-CP1000

1000W Lithium-ion Battery Charger Module

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Highlight

- Cost effective
- Support variety of batteries
- 1000W Maximum charging power
- 90V-264Vac wide input range without power derating
- 8.49”x5”x1.69” Compact size
- -20℃-50℃ operation temperature range
- Support customized charging curve
- Optional constant voltage models available
- Build-in active PFC
- Intelligent fan speed control
- Remote ON/OFF control
- Battery connection detection. Auto-stop when fully charged
- Battery reversed connection protection
- 5000M Operation altitude
- Optional 2xMOPP isolation, support medical application
- Optional 12V/1A auxiliary power supply
- CAN Bus communication. Optional RS485 version



IEC62368-1
IEC60601-1

Typical Application

- Mobile medical equipment
- Commercial robot
- Fast charging for E-bike and E-motorcycle

Product Overview

The **BPA-CP1000** is a highly reliable, compact, 1000W, AC to DC, lithium-ion battery power module. With a full range input of 90-264VAC, this power supply module achieves the highest performance and efficiency by incorporating digital control technology. The BPA-CP1000 family also includes CANBus interface to monitor and control all essential functions of the power supply module.

Custom controls available.

Key Specification

Model	BPA-CP1000T24	BPA-CP1000T28	BPA-CP1000T36	BPA-CP1000T48	BPA-CP1000T60	BPA-CP1000T72	BPA-CP1000T100
Rated Voltage	24V	28V	36V	48V	60V	72V	100V
Charge Current	41.7A	35.7A	27.8A	20.8A	16.7A	13.9A	10A
Rated Power	1000W						
Outline	8.49"x5.01"x1.69" or 215.6mmx127.2mmx43mm						
EMC	Class B Emission						

Ordering Model Name

BPA-C	P	1000	☐	24	☐	☐☐
Series	**Package**	**Rated Power**	**Connection**	**Rated Output Voltage**	**Battery Type**	**Control Code**
C: Charger	P: Force air cooling enclosed	1000W	T: Terminal Block		F: LFP Battery T: NCM Battery C(*): Customized Charging Curve	A☐: Standard

(*): For customized charging curve and any other inquires, please contact BluTek Power, Inc..

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Input Specification

Function	Minimum	Typical	Maximum	Condition
Rated Input Voltage	100Vac		240Vac	
Input Voltage Range	90Vac		264Vac	Without de-rating
Input Frequency	47Hz	50 / 60Hz	63Hz	
Input Current			12A	With rated input voltage
Power Factor	0.95			With max rated output power
Peak Efficiency (exclude fan power)			92.5%	30V and below models，230VAC
			93%	36V and higher models，230VAC
Inrush Current			40A	240Vac
Input surge voltage			300Vac	last for 1second

Output Specification

Function	Minimum	Typical	Maximum	Condition
Output Power	0W		1000W	
End-of-Charge Voltage tolerance			±0.1V	
Total regulation			±0.1V	Include line and load regulation
Output Voltage Ripple			1%	Peak-Peak value, full load measure at board end with 0.1uF Ceramic and 47uF electrolytic capacitor, 20MHz BW
Output Current Ripple			10%	20~200Hz BW, Rated battery voltage, maximum current
Dynamic Response			5%	with 50% load step
Power up time			4s	Including battery detection and current ramp up time
Rise time			50ms	Without capacitive load or battery load
Hold up time	10ms			@115Vac/60Hz, 800W Output Power

Protection Specification

Function	Minimum	Typical	Maximum	Condition
Input under voltage		80Vac		Auto-restart after fault removed
Over current protection (OCP)				Constant current control, Auto-restart after fault removed
Short circuit protection (SCP)				Constant current control, Auto-restart after fault removed
Over voltage protection (OVP)			105%	Auto-restart after fault removed
Over temperature protection (OTP)				Auto-restart after fault removed
Battery reverse		Optional		Auto-restart after fault removed

**Protection mode latch or auto-restart can be customed, contact BluTek Power, Inc. for more details.*

Standby Output Specification

Function	Minimum	Typical	Maximum	Condition
Output voltage	11.5V	12V	12.5V	
Over current protection (OCP)	1.1A			Auto-restart after fault is removed
Short circuit protection (SCP)				Auto-restart after fault is removed

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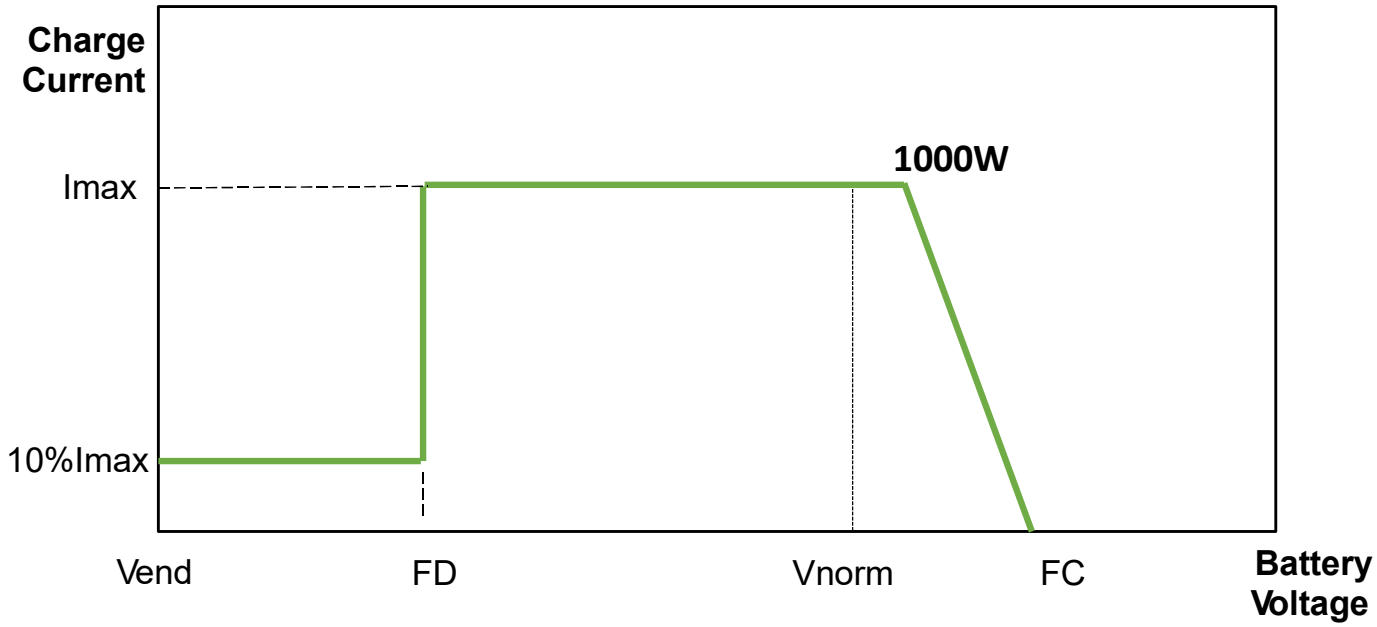
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Batteries Supported

Battery Type	Series	End-of-discharge voltage	Cut-off Voltage	Nominal Voltage	End-of-Charge Voltage	Maximum Charge Current	Models
		Vend	FD	Vnor	FC	Imax	
LFP Battery	7	14.0V	17.5V	22.4V	25.2V	41.7A	CP1000T24FA
	8	16.0V	20.0V	25.6V	29.2V	35.7A	CP1000T28FA
	11	22.0V	27.5V	35.2V	40.2V	27.8A	CP1000T36FA
	12	24.0V	30.0V	38.4V	43.8V	27.8A	CP1000T36FB
	15	30.0V	37.5V	48.0V	54.8V	20.8A	CP1000T48FA
	16	32.0V	40.0V	51.2V	58.4V	20.8A	CP1000T48FB
	20	40.0V	50.0V	64.0V	72.0V	16.7A	CP1000T60FA
	24	48.0V	60.0V	76.8V	87.6V	13.9A	CP1000T72FA
	32	64.0V	80.0V	102.4V	115.2V	10A	CP1000T100FA
NCM Battery	6	16.5V	18.0V	21.6V	25.2V	41.7A	CP1000T24TA
	7	19.25V	21.0V	25.2V	29.4V	35.7A	CP1000T28TA
	10	27.5V	30.0V	36.0V	42.0V	27.8A	CP1000T36TA
	11	30.25V	33.0V	39.6V	46.2V	27.8A	CP1000T36TB
	13	35.75V	39.0V	46.8V	54.6V	20.8A	CP1000T48TA
	14	38.5V	42.0V	50.4V	58.8V	20.8A	CP1000T48TB
	17	46.75V	51.0V	61.2V	71.4V	16.7A	CP1000T60TA
	20	55.0V	60.0V	72.0V	84.0V	13.9A	CP1000T72TA
	27	74.25V	81.0V	97.2V	113.4V	10A	CP1000T100TA

* Contact BluTek Power, Inc. for customized requirement

Charging Curve



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All parameters are set at 25℃ambient unless other specified. Version A05, June, 2025
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Reliability

Function	Minimum	Typical	Maximum	Condition
MTBF	500Khrs			According to Telecordia SR-332. 230Vac 25℃ ambient with rated load
Life	5 years			Rated conditions

EMC

Conducted Emissions	EN 55011 / EN 55032,Class B
Radiated Emissions	EN 55011 / EN 55032,Class B
Note: BPA-CP1000 is an enclosed type PSU as a component intended to be assembled and built inside the system cabinet, PSU normally is to mounted connecting to an earthed metal plate, all the EMC tests are performed with the PSU and resistive loads plated on a metal plate to simulate the system application. The final system must re-evaluate to confirm it can still meet the EMC directives.	
Harmonic Current Emissions	IEC 61003-2 Meet Class A limit
Voltage Flicker	IEC 61000-3-3
Electrostatic Discharge	IEC 61004-2 Level 4 (Air Discharge: 15 kV,Contact Discharge: 8 kV) Criteria A
Radiated Field	IEC 61000-4-3 Criteria A
Electrical Fast Transient / Burst	IEC 61000-4-4 Level 3 (2 kV),Criteria A
Surge	IEC 61004-5 Level 3 (Common Mode 2kV, Differential Mode 1kV), Criteria A
CS	IEC 61000-4-6 Level 2 (150 kHz-80 MHz, 3 Vrms, 6 Vrms at ISM bands and Amateur radio bands), Criteria A
Power Frequency Magnetic Fields	IEC 61004-8 Criteria A, Magnetic field strength 30 A/m
Voltage Dips	IEC 61000-4-11 30% 10 ms Criteria A 60% 100 ms Criteria B 100% 5000 ms Criteria B
Voltage Dips	IEC 60601-1-2 Criteria A @ 600 W or lower 0% UT, 0.5 cycle(10 ms) (0°,45°,90°,135°,180°,225°,270°,315°,360°) Criteria B 0% UT,1 cycle (20 ms), 0° Criteria B 70% UT,25 cycle (500 ms) , 0° Criteria B 0% UT,250 cycle (5000 ms) , 0°

Criteria A: Normal operation within spec limit
Criteria B: Out of regulation or restart to normal operation after test

Safety / Directives

Medical Safety *		IEC 60601-1 2nd and 3rd+A1 edition+A2 edition EN 60601-1:2006+A1+A2 ANSI/AAMI ES60601-1:2005+A1+A2/CSA 60601-1
ITE Safety *		IEC 62368-1:2018 UL 62368-1+CAN/CSA 62368-1 GB 4943.1-2011, GB 9254-2008, GB 17625.1-2012
CE*		EMC Directive 2014/30/EU and Low Voltage Directive 2014/35/EU EN 60601-1: 2006 + A1+A2 & EN 60601-1-2: 2015
UKCA*		Electrical Equipment (Safety) Regulations 2016, and Electromagnetic Compatibility Regulations 2016, Medical Devices Regulations 2002 (UK MDR 2002)
Dielectric Voltage	Input to/Output	4000Vac
	Input to/Ground	1800Vac
	Output to/Ground	1500Vac

**Compliance only, contact BluTek Power, Inc. for detailed safety certifications*

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Environmental

Function	Min	Typical	Max	Condition
Operation Temperature	-20℃		50℃	
Operation Humidity	10%		90%	Non-condensing
Storage Temperature	-40℃		70℃	
Storage Humidity	10%RH		90%RH	Non-condensing
Operation Altitude			5000m或16,405英尺	
Fan Acoustic Noise			45dB	80% Load, 1m distance
Shock			196m/s2	With Package
Vibration			19.6m/s2	155Hz (1 min sweep). 1 Hour for each axis. With package

Leakage Current

Function	Min	Typical	Max	Condition
Input-PE Leakage			300uA	264Vac/50Hz Normal Condition
			1mA	264Vac/50Hz Single Fault Condition
Output-PE Leakage			100uA	264Vac/50Hz Normal Condition
			500uA	264Vac/50Hz Single Fault Condition

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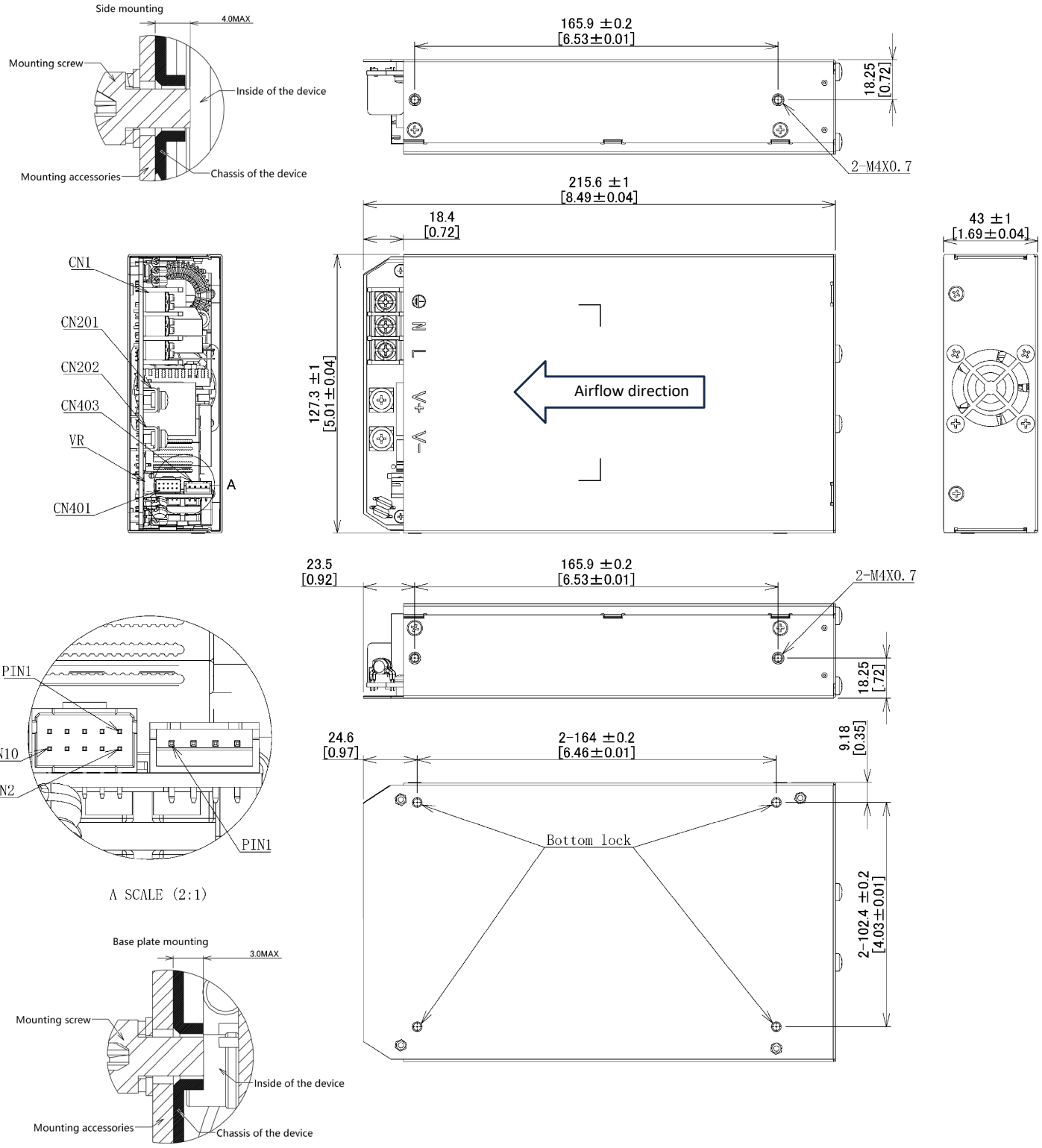
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Mechanical Drawing



Notes:

1.Base plate mounting, M4 thread holes, maximum penetration 3.0 mm (0.12 inch) from outside face of chassis, 10 kgf.cm (8.8 inch.lbs)Max torque.

2. Side mounting, M4 thread holes, maximum penetration 4.0 mm (0.16 inch) from outside face of chassis, 10kgf.cm (8.8 inch.lbs) Max torque.

3.CN1 is AC input terminal block and with M4 screw in three positions, wire gauge is 10~18 AWG, 10 kgf.cm (8.8 inch.lbs) Max torque.

4. CN201&CN202 is DC output terminal block and with M4 screw in two positions, 10kgf.cm(8.8inch.lbs) Max torque.

5. CN401/CN403 is control or signal connection.

6. VR: clockwise is to increase the output voltage, anti-clockwise is to reduce the output voltage.

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Connector and Pin Assignment

Position	Connector / Connection	
Input Connector CN1	SCED TB1100-01V-3P or Equivalent	
	Enclosure Mark	**Designation**
	L	Line
	N	Neutral
	⏚	Earth Ground

Position	Connector / Connection	
Main Output Connector CN201 and CN202	Output terminal blocks, with M4x8 screw and plastic spacer	
	Enclosure Mark	**Designation**
	Vo+	Output positive
	Vo-	Output return

Position	Connector / Connection	
Control Connector CN403	CJT A2501WR-4P or Equivalent Mating with CJT A2501H-4P or Equivalent	
	Pin#	**Description**
	1	CANL
	2	CANH
	3	CAN_GND
	4	CAN_5V

Position	Connector / Connection	
Control Connector CN401	CJT A2008WR-2X5P-46-BK or Equivalent Mating with CJT A2008H-2X5P or Equivalent	
	Pin#	**Description**
	1	C_GND
	2	C_GND
	3	12V
	4	12V
	5	Remote ON/OFF-
	6	Remote ON/OFF+
	7	Remote sense+
	8	Remote sense-
	9	N.C
	10	N.C

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Remote Sense

Remote sense feature can be used to compensate for the extra voltage drop on output wires that are connected from the main output terminals, to the load. With wires connected from the remote sense pins, at the same locations as the wires from the main output, the remote sense function can compensate up to 500mV voltage drop.

Voltage Trimming

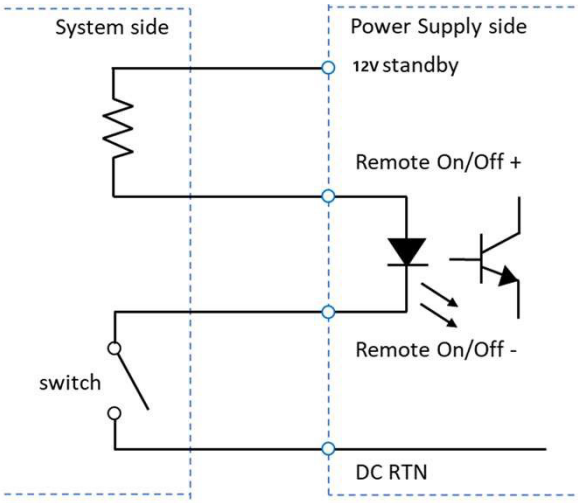
The power supply provides a potentiometer for user to adjust the output voltage. Switch the potentiometer clockwise to increase the output voltage, switch the potentiometer counterclockwise to decrease the output voltage.
Please reference to Output Specification for the output voltage range which user shall trim the voltage within.
When the output is adjusted below nominal value, the maximum output current is the same as the nominal output, when the output is adjusted above nominal value, the output power cannot exceed the nominal maximum power (the maximum output current used should be reduced accordingly).
The function is only valid for constant voltage models.

Battery detection

The power supply will detect if the battery is connected. When a battery connection is detected, the power supply will start the output to charge the battery. At the moment battery is fully charged, the power supply will stop operation.
For customized requirement or different operation sequence, please contact BluTek Power, Inc.

Remote ON/OFF

Remote ON/OFF input can be used to turn off or turn on the power supply main output
The output ON/OFF can be controlled by conducting an isolated diode located within the power supply. When the main output is disabled, the +12 V Standby output will continue to operate. System can use a switch to conduct through this diode (suggested pull up resistor to 12 V standby with 2 Kohm resistor) to disable the main out. The signal can be floated (no connection to the signal), in order to enable the main output.



CAN Communication

The power supply comes with CAN Bus communication function. Please contact BluTek Power, Inc. for communication protocols or other communication requirement.

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