BCM4CAN
CHARGER CONTROLLER
USER MANUAL

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SmartGen **Registered trademark**

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Table 1 Software Version

Date	Version	Content
2023-06-26	1.0	Original release.
2023-09-27	1.1	Delete "Rated 5A" in the description of terminal 14.

CONTENT

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1. OVERVIEW

BCM4CAN display part adopts graphic LCD, which not only can display parameters like input/output voltage, current and power, but also can record charging process and draw related charging curve to realize real-time monitoring of charging. Related parameters can be configured from front panel and language can be chosen between English and Chinese. It is simple to operate and reliable to run.

2. PERFORMANCE AND CHARACTERISTICS

Its characteristics are as below:
a) 132×64 LCD display with backlight, optional language (English, Chinese), easy operation.
b) Collect and display parameters like input/output voltage, current, power and etc.
c) Record and display current charging completion time.
d) Screen backlight duration can be set.
e) Monitor battery charging process, so as to track battery charging stage and display battery voltage which has been charged with icons.
f) Record charging voltage/current and draw charging curves accordingly.
g) With communication failure, charging failure and mains failure alarm display function.
h) Users can select automatic two-stage charging or automatic three-stage charging as needed. Both ways are designed according to charging characteristics to prevent overcharging and significantly prolong battery lifetime.
i) Output current can be adjusted through setting.
j) CAN port enables to send charging data and alarm status externally.
k) 485 port enables to monitor charging process in real time.

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3. OPERATION

3.1 KEY FUNCTION DESCRIPTION

Table 2 Key Description

Icon	Key	Description
Boost	Manual Boost	When in float charging stage, press it to enter boost charging mode, and exit automatically after reaching boost completion conditions.
$^A\text{[battery]}$	Current Adjustment	Press it to enter charging current adjustment interface so as to set charging current.
$^{12}/_{24}$	Battery Type Select	Press it to select battery type that to be charged, if select self-adaption, charger will automatically determine the connected battery types.
$^{A/V}$ [curve]	Curve View	Press it to enter voltage curve record interface, and re-press it to enter current curve record interface.
[home]	Homepage	Press it to return to homepage in main interface; Exit parameter setting and return to homepage in parameter setting interface. Hold and press for 3s to enter into lamp test function.
[up]	Up/Increase	Screen scroll in main interface; Up cursor or increase value in setting menu; Left shift cursor in curve view interface.
[set]	Set	Press it to enter menu interface; Shift cursor and confirm information in parameter setting; Change time coordinate and zoom the coordinate axis in curve view interface.
[down]	Down/Decrease	Screen scroll in main interface; Down cursor or decrease value in setting menu; Right shift cursor in curve view interface.

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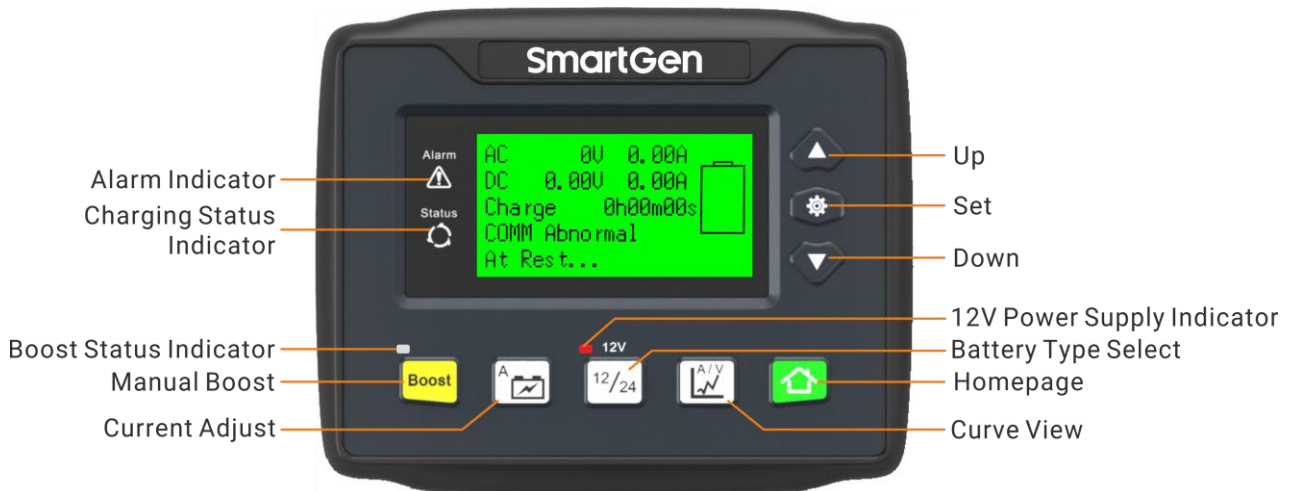### 3.2 CONTROLLER PANEL

Fig.1 Controller Panel

⚠**NOTE:** LED indicators description:

Alarm Indicator: It is flashing when there is alarm; extinguishing there is no alarm.

Charging Status Indicator: It is extinguished without charging, flashing during charging, illuminated fully charged.

Boost Status Indicator: It enters Boost status after pressing "Boost" key, indicator keeps on; indicator will extinguish when not in Boost status.

12V Power Supply Indicator: When battery type is selected as 12V or 12V battery is judged after choosing self-adaption function, the indicator is always on.

3.3 OUTPUT CURRENT SETTING OPERATION

Press $^A\text{🔋}$ to enter charging current adjustment interface (showing as right picture), then press ⚙ to select the number to be changed and increase/decrease it via pressing ▲ or ▼.
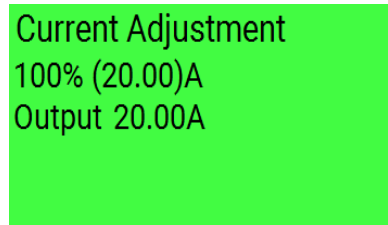
Re-press ⚙ to move to the next position to be changed. When reach to the last one, press ⚙ again to save the parameters, thus modifying the output current..

> **Current Adjustment**
> 100% (20.00)A
> Output 20.00A
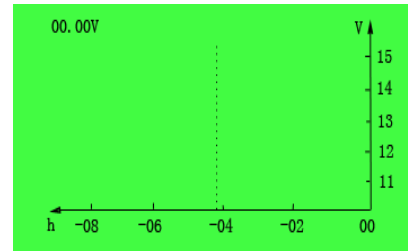
3.4 BATTERY TYPE SELECTION OPERATION

Press $^{12}/_{24}$ to enter battery selection interface (showing as right picture), then press ⚙, the second line turns black, showing 12V battery type is selected, change the type via pressing ▲ or ▼.
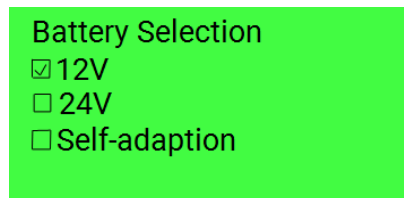
After battery type is selected, press ⚙ to save the option, and the symbol "☑" stands for the battery type following it has been selected.

> **Battery Selection**
> ☑12V
> ☐24V
> ☐Self-adaption

3.5 CURVE VIEW OPERATION

press ⎍ to enter voltage curve interface (showing as right picture), and re-press it to enter current curve interface. In curve interface, short press △ or ▽ will left/right shift vertical cursor one-step; hold and press △ or ▽ will continuously left/right shift vertical cursor. If cursor position is changed, the corresponding position's record value can be checked. When the cursor is moved to curve boundary, abscissa of the curve will left/right move one unit time automatically, thus users can check the earlier record. In curve interface, press ⚙ can change the length of unit time, such as 2h can be changed as 4h, 6h, 8h, and 12h, aiming to compress the curve to show a curve for a wider time period.
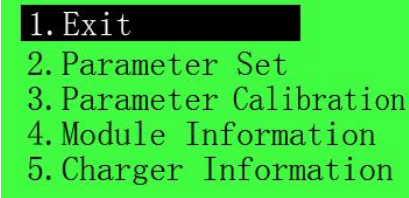
4.   WARNING
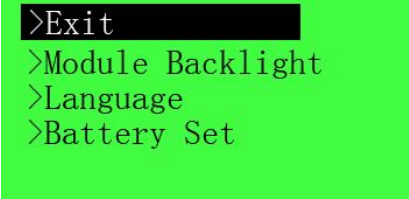
Table 3 Warning

No.	Type	Description
1	Comm. Failure	When display module cannot receive the charger data, alarm indicator will flash and "Communication Failure" will be displayed in LCD.
2	Mains Failure	When output terminal of charger does not connect with battery, mains will switch off and charger will stop working; When connecting with battery, charger detects mains switch off, it will continue to work if mains recover in 30s; otherwise, alarm indicator will flash and "Mains Failure" will be displayed in LCD.
3	Charging Failure	When charger is in boost charging stage or fast charging stage, simultaneously, output current is detected below 100mA for 30s, then charging fails and alarm indicator will flash, "Charging Failure" will be displayed in LCD.

5. PARAMETER SETTING

Press ⚙ to enter parameter settings menu after starting the charger.

Table 4 Parameter Setting Operation

No.	Interface	Operation
1	1.Exit 2.Parameter Set 3.Parameter Calibration 4.Module Information 5.Charger Information	Press △ or ▽ to up or down to select the content needs to be set, and then press ⚙ to enter setting. Select 1. Exit and press ⚙ to return to the previous page, and then press 🏠 to go back to the main interface.
2	>Exit >Module Backlight >Language >Battery Set	After selecting 2. Parameter Set of No.1 interface, press ⚙ to enter this interface; press △ or ▽ to select the content needs to be set, and then press ⚙ to enter setting.
3	Module Backlight 03min Module Backlight 03min	After selecting >Module Backlight of No.2 interface, press ⚙ to enter this interface. Cursor appears on the leftmost number after repressing ⚙. Press ⚙ again to right move cursor to select the content needs to be changed, and increase/decrease number value through pressing △ or ▽. After setting, press ⚙ to move cursor until the cursor moves to the last digit of the value group, and then repress ⚙ to finish the data setting. At last press ▽ to return to the previous page, and then press 🏠 to go back to the main interface.

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No.	Interface	Operation
4	Language 0. Simplified Chinese Language 1. English	After selecting >Language of No.2 interface, press ⚙ to enter this interface, and cursor appears after repressing ⚙. Select parameter needs to be changed, and press 🔺 or 🔻 to choose the target parameter. Then press ⚙ to finish the setting. At last press 🔻 to return to the previous page, and then press 🏠 to go back to the main interface.
5	Battery Set >Exit >Rated Output Current >Charge Current >Battery Select	After selecting >Battery Set of No.2 interface, press ⚙ to enter this interface. Setting method is same as No.2, No.3 and No.4, and operation details please to see No.2, No.3 and No.4 operation.
6	Module Information Module Type BCM4CAN SW Ver1.0 2023-06-25 HW Ver1.3 2017-01-21	After selecting 4. Module Information of No.1 interface, press ⚙ to enter this interface to check controller's model, software/hardware version and the release date.
7	Charger Information Type BACM2420 SW Ver1.0 2017-02-17 HW Ver1.5 2017-01-09	After selecting 5. Charger Information of No.1 interface, press ⚙ to enter this interface to check charger's model, software/hardware version and the release date.

⚠**NOTE:** Parameter setting please refer to the following *Parameter Setting Contents and Range Table*.

Table 5 Parameter Setting Contents and Range Table

| Item	Parameter Range		Default Value		Description
	24V	12V	24V	12V	
Module Backlight Set	(0-60)min		3min		Always on for 0min.
Language	(0~1)		0		0: Simplified Chinese; 1: English
Rated Output Current	Non-adjustable		/		Display according to the rated current of connected charger.
Charging Current	(0~100)%		100%		Max. rated charging current percentage.
Battery Selection	(1~3)		2		1: 12V; 2: 24V; 3: Self-adaption.
Charging Stage	(2~3)		3		2: Two-stage; 3: Three-stage.
Boost Voltage	(20~30)V	(10~15)V	28.2V	14.1V	Voltage value in constant voltage charging mode.
Float Voltage	(20~30)V	(10~15)V	27.0V	13.5V	Voltage value in float charging mode.
Boost Time Enable	(0~1)		1		0: Disable; 1: Enable
Boost Time Set	(0.1~100)h		1.0h		Constant voltage charging time.
Boost Completion Current Enable	(0~1)		1		0: Disable; 1: Enable
Boost Completion Current Set	(0.20~3.00)A		0.5A		Current value when boost charging turns to float charging.
Auto BOOST Volt Set	(20~30)V	(10~15)V	25.6V	12.8V	When charger in float charging mode, battery turns to fast charging mode automatically as soon as battery voltage drops to this value.
Auto BOOST Volt Delay Value	(0~3600)s		20s		Battery enters BOOST delay when battery voltage drops to BOOST voltage.
Low-voltage Trickle Charging Enable	(0~1)		1		0: Disable; 1: Enable
Low-voltage Trickle Charging Voltage	(20~30)V	(10~15)V	22.0V	11.0V	Voltage value of trickle charging.
Low-voltage Trickle Charging Current	(0~100)%		50%		Max rated charging current percentage.

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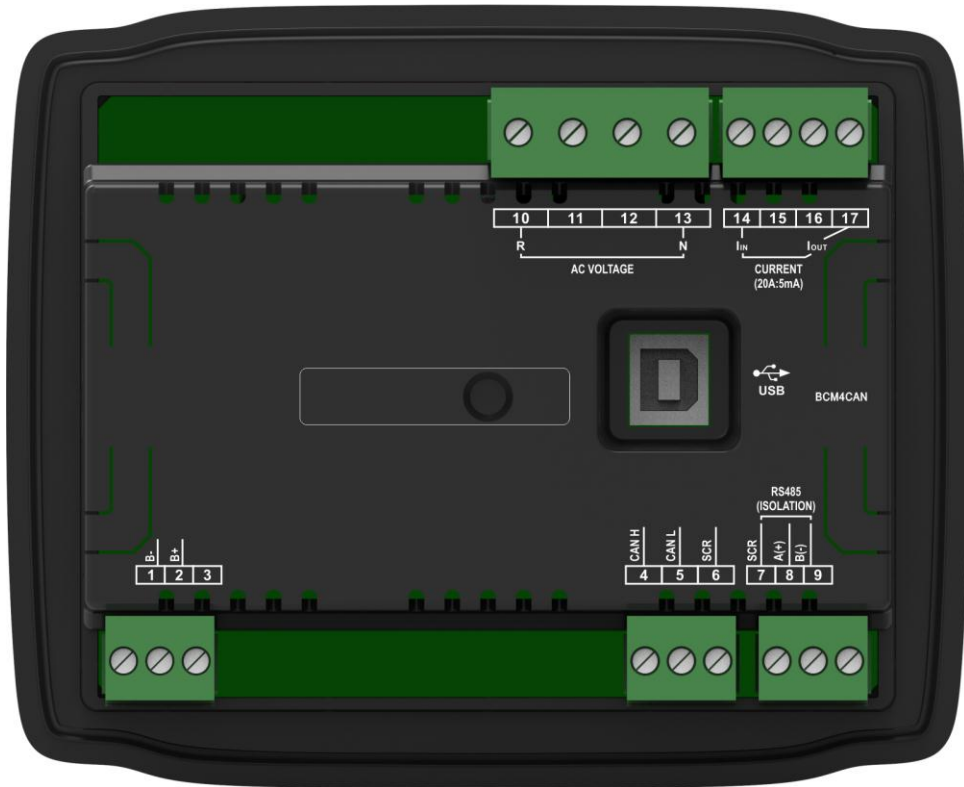
6. WIRING

Fig.2 Controller Rear Panel

Table 6 Wiring Terminal Connection Description

No.	Function	Cable Size	Remark
1	B-	2.5mm^2	Connect to negative of starting battery.
2	B+	2.5mm^2	Connect to positive of starting battery; If wire length is over 30m, better to double wires in parallel. Max. 20A fuse is recommended.
4	CAN H	0.5mm^2	Impedance-120Ω shielding wire is recommended with its single-end grounded. 120Ω match resistor has been internally connected.
5	CAN L	0.5mm^2	
6	CAN SCR	0.5mm^2	
7	RS485 SCR	/	Impedance-120Ω shielding wire is recommended with its single-end grounded.
8	RS485+	0.5mm^2	
9	RS485-	0.5mm^2	
10	Mains R Phase Volt Monitoring	1.0mm^2	Connect to Mains R phase (2A fuse is recommended).
13	Mains N1 Wire	1.0mm^2	Connect to mains N wire.
14	CT A Phase Monitoring	1.5mm^2	Connect to CT secondary coil externally.
17	CT COM	1.5mm^2	

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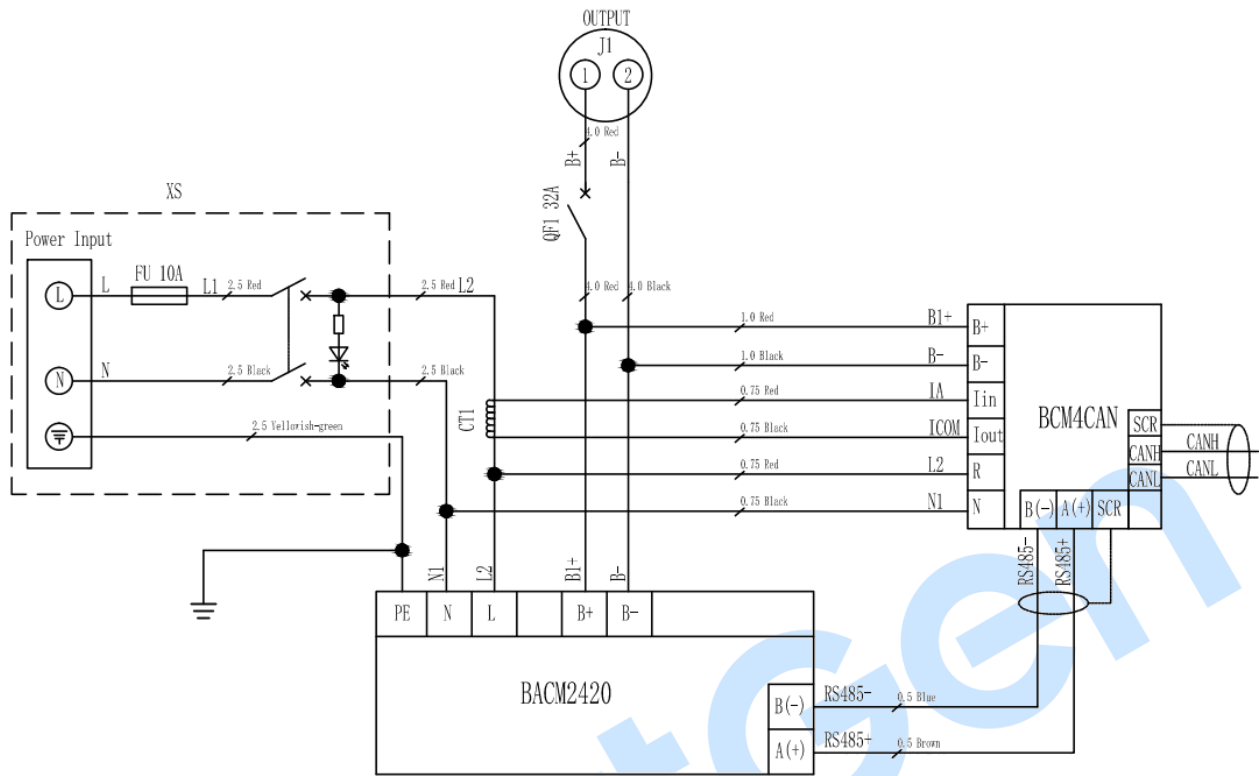## 7. TYPICAL APPLICATION DIAGRAM

Fig.3 Typical Application Diagram
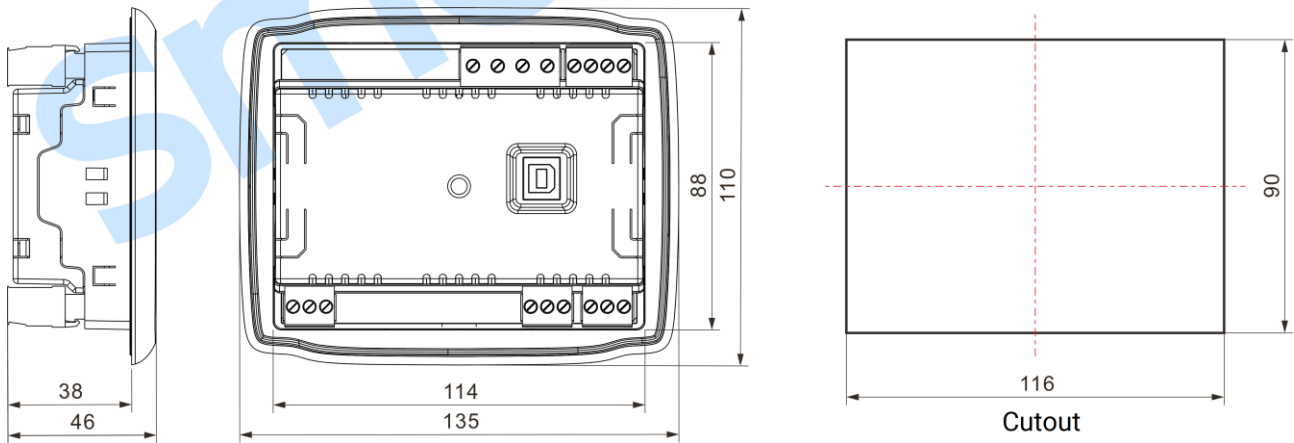
8. OVERALL DIMENSIONS

Fig.4 Overall Dimensions (Unit: mm)

BCM4CAN series controller can be suitable for (8~35)VDC battery voltage environment.

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