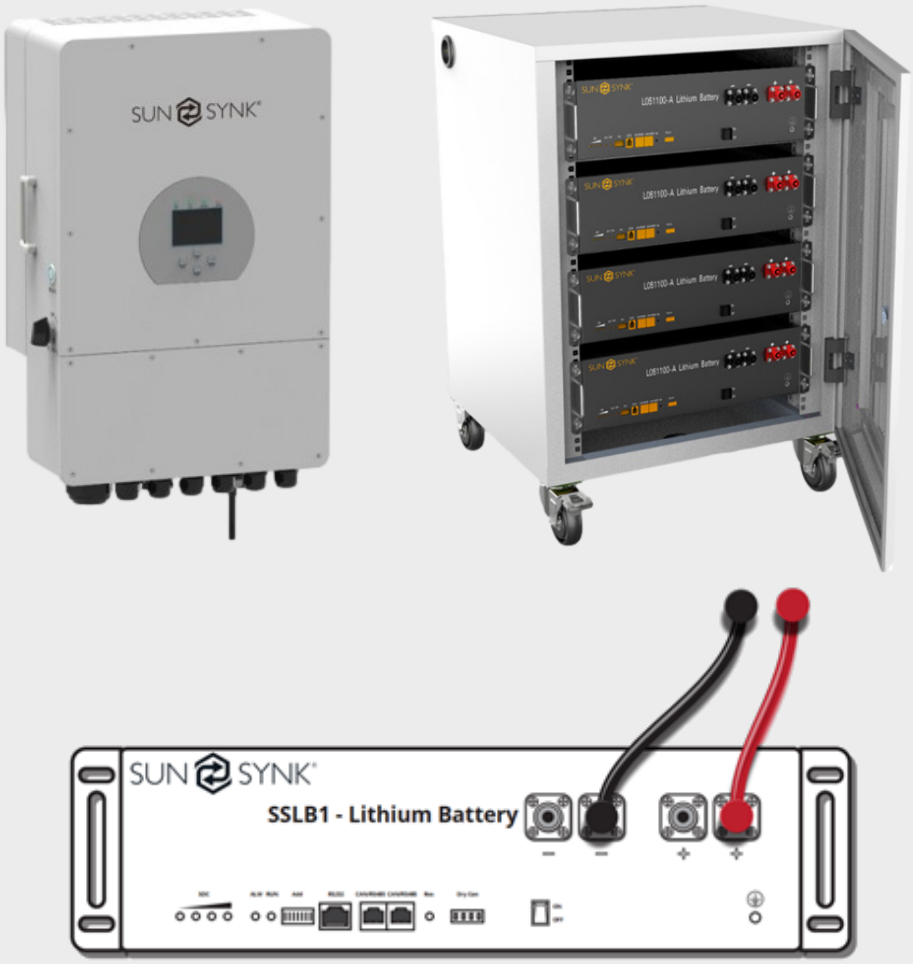
BATTERY COMPATIBILITY



USER MANUAL

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v.19 (30/05/24)

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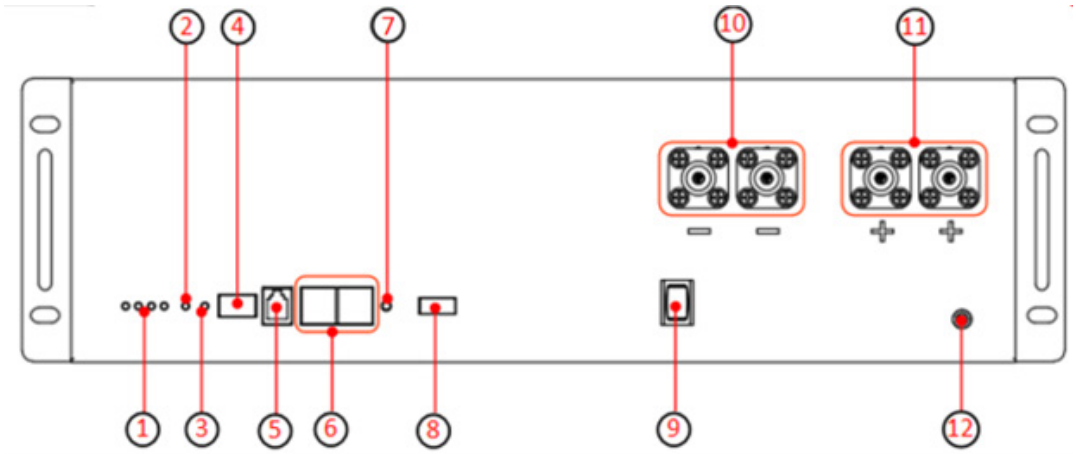
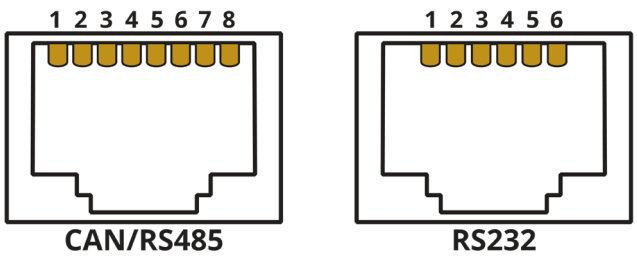
1. INTRODUCTION

This Battery Compatibility document is applied to all Sunsynk Hybrid Inverters, including three-phase, standard single-phase, rack-mounted single-phase, and the Lifelynk.
Sunsynk Hybrid Inverters can work with both lithium and AGM batteries. The type of battery you choose would often depend upon your budget. In the case of using lithium-ion batteries, these operate according to the Battery Management System (BMS). Without the use of a BMS, it is very difficult for the inverter to know the State of Charge (SOC). Therefore, the BMS will provide the inverter with the SOC and the maximum charge and discharge parameters that are allowed for that particular battery.
When connecting a lithium battery, you must hook up a communication cable between the inverter and the battery. Every battery has different settings, so you need to refer to the manufacturer user manual and also check on our user manual to see if that particular battery can be used. The battery may look like this:



Item	Name	Model	Remarks
1	SOC LED x4		
2	Alarm LED		
3	RUN LED		
4	Dialer		
5	Communication port	RJ11	RS232 To upper machine
6	Communication port *2	RJ45	CAN To PCS RS485 Internal Connection
7	Reset		Waken system from malfunction status
8	Dry Contact		
9	Power On/Off Switch		
10	Port Negative x2	PSR6XAB	Black 5.7, 25mm2
11	Port Positive x2	PSR6XBB	Orange 5.7, 25mm2
12	GND	M6	Yellow-Green, 10AWG

Depending on the type of battery you are using, it may require either CAN/RS485 or RS232 communication. Sunsynk Hybrid Inverters support both methods of communication.



CAN/RS485 and RS232 pins description.

The following table is the connection on **battery side:**

	Description
CAN	Pin 1: CAN-H Pin 5: CAN-L Pin 2, 3, 4, 6, 7, 8: NC
RS485	Pin 1: RS485B Pin 2: RS485A Pin 3: GND Pin 6: GND Pin 7: RS485B Pin 8: RS485A Pin 4, 5: NC
RS232	Pin 3: BMS transmit; Computer receiver Pin 4: BMS receiver; Computer transmit Pin 5: GND Pin 1, 2, 6: NC

The following table is the connection on **inverter side:**

	Description
CAN	Pin 4: CAN-H Pin 5: CAN-L Pin 1, 2, 3, 6, 7, 8: NC
RS485	Pin 1: RS485B Pin 2: RS485A Pin 3: GND Pin 6: GND Pin 7: RS485B Pin 8: RS485A Pin 4, 5: NC
RS232	Pin 3: BMS transmit; Computer receiver Pin 4: BMS receiver; Computer transmit Pin 5: GND Pin 1, 2, 6: NC

In the following sections, some specifications of these protocols and the batteries that are compatible with the Sunsynk Hybrid Inverters will be presented.

2. CAN BUS PROTOCOL

Utilize standard frame, a communication rate of 500kbps, and a data transmission cycle equals 1s. The inverter replies every second: 0x305: 00-00-00-00-00-00-00-00.

CAN ID: 0x359			
Byte 0	Protection	Table 1	
Byte 1	Protection	Table 2	
Byte 2	Alarm	Table 3	
Byte 3	Alarm	Table 4	
Byte 4	Module numbers		8 bits unsigned char
Byte 5	"P"	0x50	
Byte 6	"N"	0x4E	
Byte 7	-		

- **Table 1**

Bit 7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
Discharge overcurrent			Cell under temperature	Cell over temperature	Cell or module under voltage	Cell or module over voltage	

- **Table 2**

Bit 7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
				System error			Charge over current

- **Table 3**

Bit 7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
Discharge high current			Cell low temperature	Cell high temperature	Cell or module low voltage	Cell or module high voltage	

- **Table 4**

Bit 7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
				Internal communication fail			Charge high current

CAN ID: 0x351			
Byte 0	Battery charge voltage	Unit: 0.1V	16 bits unsigned int
Byte 1			
Byte 2	Charge current limit	Unit: 0.1A	16 bits signed int, 2`s complement
Byte 3			
Byte 4	Discharge current limit	Unit: 0.1A	16 bits signed int, 2`s complement
Byte 5			
Byte 6			
Byte 7			

CAN ID: 0x355			
Byte 0	SOC of single module or average value of system	Unit: 1%	16bit unsigned int
Byte 1			
Byte 2	SOH of single module or average value of system	Unit: 1%	16bit unsigned int
Byte 3			
Byte 4			
Byte 5			
Byte 6			
Byte 7			

CAN ID: 0x356			
Byte 0	Voltage of single module or average module voltage of system	Unit: 0.1V	16 bits signed int, 2`s complement
Byte 1			
Byte 2	Module or system total current	Unit: 0.1A	16 bits signed int, 2`s complement
Byte 3			
Byte 4	Average cell temperature	Unit: 0.1ºC	16 bits signed int, 2`s complement
Byte 5			
Byte 6			
Byte 7			

CAN ID: 0x35C			
Byte 0	Request flag	Table 5	
Byte 1			

- **Table 5**

Bit 7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
Charge enable	Discharge enable	Request force charge I*	Request force charge II*	Request full charge**			

***For US2000B: Please use bit 5, the SOC range is: 15~19%. Bit 4 is NULL.**
***For US2000B-Plus: Bit 5 the SOC range is 5~10%.**

Bit 5 is designed for inverter to allow the battery to shut down and be able to wake the battery up to charge it. Bit 4 is designed if the inverter does not want the battery to shut down and be able to charge the battery before shut down to avoid low energy. We suggest inverter to use this bit.
In this case, the inverter itself should set a threshold of SOC. After force charge, only when battery SOC is higher than this threshold, then the inverter will allow discharge to avoid force charge and discharge status change frequently.

****Request full charge:**

Reason: when the battery is not fully charged for a long time, the accumulative error of SOC calculation will be too high and may not able to be charged or discharged as expected capacity.
Logic: if SOC never higher than 97% in 30 days, will set this flag to 1. And when the SOC is ≥ 97%, the flag will be 0.
How to: we suggest inverter to charge the battery by the grid when this flag is 1.

CAN ID: 0x35C			
Byte 0	Manufacturer Name	PYLON	ASCII
Byte 1			

3. RS485 PROTOCOL

3.1. Port Settings

Transmission Rate: 115.2 kb/s (recommended), 9.6 kb/s.
Format:

- Start bit 1 bit.
- Data bit 8 bit.
- Stop it 1 bit.
- Without Parity.

3.2. Basic Format

3.2.1. Basic Format of Frame

No	1	2	3	4	5	6	7	8	9
Byte number	1	1	1	1	1	2	LENID/2	2	1
Format	SOI	VER	ADR	CID1	CID2	LENGTH	INFO	CHKSUM	EOI

3.2.2. Introduction of Frame

No	Mark	Meaning	
1	SOI	Start bit mark	
2	VER	Version of protocol	
3	ADR	(0, 255) / Address	Single group: start from 2
4	CID1	Control identify code	
5	CID2	Command information: control mark code (show the data or control command type) Response information: return code	
6	LENGTH	INFO length, including LENID and LCHKSUM	
7	INFO	Command information: command INFO Response information: data INFO	
8	CHKSUM	CHECKSUM	
9	EOI	End code	CR(0DH)

- Command INFO

Command group	1 byte	Group number of same type of device
Command type	1 byte	Different remote control command or different control command in history data transmission
Command id	1 byte	Different monitoring point of same type device group
Command time	7 bytes	Time field. See table data time format

- Data INFO

DATAI	Fixed point number response information (not included in this protocol)
DATAF	Floating point number response information
DATA FLAG	Data flag information
RUN STATE	Status of battery
WARN STATE	Alarm information
DATA TIME	Event time record (not included in this protocol)

- Data INFO Flag Format

	Bit 7	**Bit 6**	**Bit 5**	**Bit 4**		**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**	
Value	0	0	0	0	1	0	0	0	0	1
Statement				No unread switch-ing	Exist unread switch-ing value change				No unread alarm value change	Exist unread alarm value change

3.3. Data Format

3.3.1. Basic Data Format

SOI and EOI are explained and transferred in HEX. Other items are explained in HEX, transferred in HEX-ASCII, each byte contains 2 ASCII. E.g. CID2 = 4BH, transfer in 2 byte, 34H (“4” in ASCII), and 42H (“B” in ASCII).

3.3.2. Length Data Format

HIGH								LOW							
LCHKSUM				LENID											
D15	D14	D13	D12	D11	D10	D9	D8	D7	D6	D5	D4	D3	D2	D1	D0

LENID represents the number of ASCII code bytes of the INFO item. When LENID=0, INFO is empty, that is, there is no item. It means the number of byte of ASCII in INFO, when LENID = 0, means INFO is empty.
LENID has 12 bits, data package should smaller than 4095 bytes.
In LENGTH transmission, the high byte is transmitted first, and then the low byte is transmitted in four ASCII codes.
To calculate LCHKSUM: D11D10D9D8+D7D6D5D4+D3D2D1D0, add the sum, modulus 16 take remainder, then do a bitwise invert and then plus 1.

Example:
The number of bytes of ASCII code in INFO is 18, that is, LENID=000000010010B.
In INFO the number of ASCII is 18, then LENID = 000000010010B D11D10D9D8+D7D6D5D4+D3D2D1D0=00 00B+0001B+0010B=0011B.

The remainder of modulus 16 is / modulus 16 the remainder = 0011B.

Invert and add 1 to /do a bitwise invert and plus 1 = 1101B.
LCHKSUM = 1101B.
LENGTH = 1101000000010010B, trans: D012.

3.3.3. CHKSUM Data Format

The calculation of CHKSUM is that except SOI, EOI and CHKSUM, other characters are accumulated and summed according to the ASCII code value, and the result is modulo 65536Invert the remainder and add 1.

Except for SOI, EOI and CHKSUM, add sum number of other characters in ASCII, the result modulus 65536 take remainder, then do a bitwise invert and then plus 1.

Example:
If we have a character: "~1203400456ABCEFEFC71\R " ("~" is SOI, "CR" is EOI).
The last 5 character "FC71\R", the FC71 is the CHKSUM.

Calculate:
1'+ '2'+ '0'+ ...+'F'+ 'E'+31H+32H+30H+...+46H+45H+038FH
038FH modulus 65535 remainder = 038FH, do a bitwise invert and plus 1 = FC71H.

3.3.4. DATA INFO Data Format

Analog quantity is transmitted in form of fixed-point or floating-point.

- Fixed-point (integer, 2 bytes).
- This protocol uses fixed-point.
- Signed integer: 32768 ~ +32767.
- Unsigned integer: 0 ~ +65535.

3.3.5. DATA TIME and COMMAND TIME Format

Year	1-9999	Integer	2 bytes, HEX
Month	1-12	Char	1 byte, HEX
Day	1-31	Char	1 byte, HEX
Hour	0-23	Char	1 byte, HEX
Minute	0-59	Char	1 byte, HEX
Second	0-59	Char	1 byte, HEX
Note	Year is transferred as integer, actual value = transfer value		

3.4. Module Introduction

Use RS485 bus with default communication rate 9600 BPS.

3.5. Encoding Table

3.5.1. CID1

No	Content	CID1	Note
1	Battery data	46H	

3.5.2. CID2

- Command Information

No	Content	CID2	Note
1	Get analog value, fixed point	42H	
2	Get alarm info	44H	
3	Get system parameter, fixed point	47H	
4	Get protocol version	4FH	
5	Get manufacturer info	51H	

No	Content	CID2	Note
6	Get charge, discharge management info	92H	
7	Get SN number of battery	93H	
8	Set value of charge, discharge management info	94H	
9	Turnoff	95H	
10	Get firmware info	96H	
11	Obtain the basic information of the battery pack system	60H	This group of commands is only for the host address
12	Get System analog data	61H	
13	Get system alarm info	62H	
14	Get system charge discharge management info	63H	
15	System shutdown	64H	

- Response Information

No	Content	CID2	Note
1	Normal	00H	
2	VER error	01H	
3	CHKSUM error	02H	
4	LCHKSUM error	03H	
5	CID2 invalid	04H	
6	Command format error	05H	
7	Invalid data	06H	INFO data invalid
8	ADR error	90H	
9	Communication error	91H	Internal communication error

- Fixed Point Type

No	Telemetering content	Data type
1	Cell voltage	Signed integer
2	Temperature	Signed integer
3	Module voltage	Unsinged integer

No	Telemetering content	Data type
4	Module current	Signed integer, charge is +
5	System parameter	Signed integer
6	capacity	Unsigned integer

3.5.3. ADR Settings

Refer to the product specification for the definition of product dialing code. Each group can be cascaded at most n units (refer to the battery product manual), and the battery address is:

(n)	Position
2	Master battery
3	Slave 1
4	Slave 2
5	Slave 3
6	Slave 4
7	Slave 5
8	Slave 6
9	Slave 7
10	Slave 8
A	Slave 9
B	Slave 10
C	Slave 11
D	Slave 11
E	Slave 12
F	Slave 13

Dip switch 2-4 of master battery has the function of change the group address. 1 is up, 0 is down.

Dip 1	Dip 2	Dip 3	Dip 4	group address (m)
1: RS485 baud rate=9600 0: RS485 baud rate=115200 *Restart to take effect/ After setting restart take effect*	0	0	0	0: When using a single battery, please make sure that the master is X000 and the slave. No restriction/single group only. Master battery must follow this setting.
	1	0	0	1: When using multiple groups, the first group needs to start from X100 to ensure the ground. Multi-group condition should use this for the first group
	0	1	0	2
	1	1	0	3
	0	0	1	4
	1	0	1	5
	0	1	1	6
	1	1	1	7

How to get the information of a single battery:
ADR = battery address + group address = 0x0n + 0x10*m

E.g.:
1) Single group slave 4:
n = 5; m = 0
ADR = 0x05 + 0x10*0 = 0x05; INFO of COMMAND = ADR = 0x05

2) multi group, group 3, slave 6;
n = 7; m = 3
ADR = 0x07 + 0x10*3 = 0x37; INFO of COMMAND = ADR = 0x37

3.6. Communication protocol for system

Obtain system information by asking the host of each group.
The query command is fixed, and the address is related to the dialing code of the host.
The following commands only support host address response, that is, only addresses 12, 22, 32, 42, 52, 62, 72 are valid, and other addresses are invalid.
For the analog quantity information that does not exist in some models, upload the FF placeholder.

3.6.1. Obtain the Basic Information of the Battery Pack System

- Command

No	1	2	3	4	5	6	7	8	9
Bytes	1	1	1	1	1	2	LENID/2	2	1
format	SOI	VER	ADR	46H	60H	LENGTH	INFO	CHKSUM	EOI

- Response

No	1	2	3	4	5	6	7	8	9
Bytes	1	1	1	1	1	2	LENID/2	2	1
format	SOI	VER	ADR	46H	RTN	LENGTH	INFO	CHKSUM	EOI

No	Content	Data
1	Host device name/battery name	10, integer, ASCII
2	Host manufacturer name/manufacturer name	20, integer, ASCII
3	Host software version/software version	2
4	Number of batteries	1
5	Bar code of battery 1	16 ASCII
6	Barcode for battery 2	16 ASCII
4+N	Bar code of battery N	16 ASCII

E.g. :
Send command/send command:
7E 32 30 31 32 34 36 36 30 30 30 30 30 30 46 44 41 42 0D

Response data/receive data:
7E 32 30 31 32 34 36 30 30 36 30 38 32 34 36 36 46 37 32 36 33 36 35 35 46 34 43 30 30 30 3030 30 35 30 37 39 36 43 36 46 36 45 30 30 30 30 30 30 30 30 30 30 30 30 30 30 30 30 30 30 3030 30 30 30 30 30 30 30 30 30 30 30 30 30 39 30 32 33 30 33 31 33 32 33 33 33 34 33 35 33 36 33 3733 38 33 39 36 31 36 32 36 33 36 34 36 35 36 36 33 31 33 31 33 32 33 33 33 34 33 35 33 36 33 3733 38 33 39 36 31 36 32 36 33 36 34 36 35 36 36 45 33 35 33 0D

Meaning of response data:

No	Content	Data	
1	Host device name/battery name	34 36 36 46 37 32 36 33 36 35 35 46 34 43 30 30 30 30 30 30	“Force_L”
2	Host manufacturer name/ manufacturer name	35 30 37 39 36 43 36 46 36 45 30 30 30 30 30 30 30 30 30 30 30 30 30 30 30 30 30 30 30 30 30 30 30 30 30 30 30 30 30 30 30 30 30 30	“Pylon”
3	Host software version/soft-ware version	30 30 30 39	0x0009
4	Number of batteries	30 32	0x02
5	Bar code of battery 1	33 30 33 31 33 32 33 33 33 34 33 35 33 36 33 37 33 38 33 39 36 31 36 32 36 33 36 34 36 35 36 36	“0123456789abcdef”
6	Barcode for battery 2	33 31 33 31 33 32 33 33 33 34 33 35 33 36 33 37 33 38 33 39 36 31 36 32 36 33 36 34 36 35 36 36	“1123456789abcdef”

3.6.2. Obtaining Battery System Operating Analog Information

- Command

No	1	2	3	4	5	6	7	8	9
Bytes	1	1	1	1	1	2	LENID/2	2	1
format	SOI	VER	ADR	46H	61H	LENGTH	INFO	CHKSUM	EOI

- Response

No	1	2	3	4	5	6	7	8	9
Bytes	1	1	1	1	1	2	LENID/2	2	1
format	SOI	VER	ADR	46H	RTN	LENGTH	INFO	CHKSUM	EOI

INFO Content:

No	Content	Data byte	Unit and calculation description	Accuracy
1	The total average voltage of the battery pack system	2	V	3
2	Total current of battery pack system	2	A	2
3	Battery pack system SOC	1	%	0
4	Average number of cycles	2	Times	0

No	Content	Data byte	Unit and calculation description	Accuracy
5	Maximum number of cycles	2	Times	0
6	Average SOH	1	%	0
7	Minimum SOH	1	%	0
8	Single core maximum voltage	2	V	3
9	The module where the highest voltage of the single core is located	2	eg: 34H represents the battery pack with address dial code 3 Battery module in address 4	
10	Single core minimum voltage	2	V	3
11	The module where the lowest voltage of the single core is located	2	eg: 34H represents the battery pack with address dial code 3 Battery module in address 4	
12	Average temperature of single core	2	Kelvin temperature: K Temperature blow 0 the value is negative e.g.: 25.5ºC = 25.5*10+2731=2986 -12.4ºC = -12.4*10+2731=2607	1
13	Maximum temperature of single core	2	Kelvin temperature: K	1
14	The module where the highest single core temperature is located	2	eg: 34H represents the battery pack with address dial code 3 Battery module in address 4	
15	Single core minimum temperature	2	Kelvin temperature: K	1
16	The module where the lowest temperature of the single core is located	2	eg: 34H represents the battery pack with address dial code 3 Battery module in address 4	
17	MOSFET average temperature	2	Kelvin temperature: K	1
18	MOSFET Maximum temperature	2	Kelvin temperature: K	1
19	MOSFET Module where the highest temperature is located	2	eg: 34H represents the battery pack with address dial code 3 Battery module in address 4	
20	MOSFET lowest temperature	2	Kelvin temperature: K	1
21	MOSFET Module where the lowest temperature is located	2	eg: 34H represents the battery pack with address dial code 3 Battery module in address 4	
22	BMS average temperature	2	Kelvin temperature: K	1
23	BMS Maximum temperature	2	Kelvin temperature: K	1

No	Content	Data byte	Unit and calculation description	Accuracy
24	BMS Module where the highest temperature is located	2	eg: 34H represents the battery pack with address dial code 3 Battery module in address 4	
25	BMS lowest temperature	2	Kelvin temperature: K	1
26	BMS Module where the lowest temperature is located	2	eg: 34H represents the battery pack with address dial code 3 Battery module in address 4	

E.g. :
Send command/send command:
7E 32 30 31 32 34 36 36 31 30 30 30 30 46 44 41 41 0D

Response data/receive data:
7E 32 30 31 32 34 36 30 30 38 30 36 32 32 45 35 33 36 31 41 38 36 32 30 39 44 34 30 42 37 34 36 32 36 31 30 44 42 38 30 30 33 34 30 43 42 42 30 30 31 34 30 42 41 41 30 42 42 37 30 30 33 35 30 42 39 44 30 30 31 35 30 42 41 41 30 42 42 38 30 30 33 36 30 42 39 43 30 30 31 36 30 42 41 4130 42 42 36 30 30 33 37 30 42 39 45 30 30 31 37 45 38 36 32 0D

Meaning of response data:

No	Content	Data	
1	The total average voltage of the battery pack system	32 45 35 33	0x2E53, 11.859V
2	Total current of battery pack system	36 31 41 38	0x61A8, 25.00A
3	Battery pack system SOC	36 32	0x62, 98%
4	Average number of cycles	30 39 44 34	0x09D4, 2516 Times
5	Maximum number of cycles	30 42 37 34	0x0B74, 2932 Times
6	Average SOH	36 32	0x62, 98%
7	Minimum SOH	36 31	0x61, 97%
8	Single core maximum voltage	30 44 42 38	0x0DB8, 3.512V
9	The module where the highest voltage of the single core is located	30 33 30 34	0x0304, address dial code 3 The battery module at address 4 in the battery pack
10	Single core minimum voltage	30 43 42 42	0x0CBB, 3.259V
11	The module where the lowest voltage of the single core is located	30 31 30 34	0x0104,
12	Average temperature of single core	30 42 41 41	0x0BAA, 25.5°C
13	Maximum temperature of single core	30 42 42 37	0x0BB7, 26.8°C
14	The module where the highest single core temperature is located	30 33 30 35	0x0305,

No	Content	Data	
15	Single core minimum temperature	30 42 39 44	0x0B9D, 24.2°C
16	The module where the lowest temperature of the single core is located	30 31 30 35	0x0105,
17	MOSFET average temperature	30 42 41 41	0x0BAA, 25.5°C
18	MOSFET Maximum temperature	30 42 42 38	0x0BB8, 26.9°C
19	MOSFET highest temperature module	30 33 30 36	0x0306,
20	MOSFET lowest temperature	30 42 39 43	0x0B9C, 24.1°C
21	MOSFET lowest temperature modue	30 31 30 36	0x0106,
22	BMS average temperature	30 42 41 41	0x0BAA, 25.5°C
23	BMS maximum temperature	30 42 42 36	0x0BB6, 26.7°C
24	The module where the highest temperature of the BMS is located	30 33 30 37	0x0307,
25	BMS minimum temperature	30 42 39 45	0x0B9E, 24.3°C
26	BMS lowest temperature module	30 31 30 37	0x0107,

3.6.3. Obtaining the Alarm Information Status of the Battery Pack System

- Command

No	1	2	3	4	5	6	7	8	9
Bytes	1	1	1	1	1	2	LENID/2	2	1
format	SOI	VER	ADR	46H	62H	LENGTH	INFO	CHKSUM	EOI

- Response

No	1	2	3	4	5	6	7	8	9
Bytes	1	1	1	1	1	2	LENID/2	2	1
format	SOI	VER	ADR	46H	RTN	LENGTH	INFO	CHKSUM	EOI

No	Content	Byte	Note
1	System alarm status 1	1	
2	System alarm status 2	1	
3	System protection status 1	1	
4	System protection status 2	1	

System alarm status 1:

Bit	Content	Note
7	Module total pressure high pressure	0: normal; 1: trigger
6	Module total pressure low pressure	0: normal; 1: trigger
5	Module total voltage single core voltage high voltage low voltage	0: normal; 1: trigger
4	Single core voltage low voltage	0: normal; 1: trigger
3	Single core temperature high temperature	0: normal; 1: trigger
2	Single core temperature low temperature	0: normal; 1: trigger
1	MOSFET high temperature	0: normal; 1: trigger
0	Single-core voltage consistency alarm	0: normal; 1: trigger

System alarm status 2:

Bit	Content	Note
7	Single core temperature consistency alarm	0: normal; 1: trigger
6	Charging overcurrent warning	0: normal; 1: trigger
5	Discharge overcurrent warning	0: normal; 1: trigger
4	Internal communication error	0: normal; 1: trigger
3		
2		
1		
0		

System protection status 1:

Bit	Content	Note
7	Module total voltage overvoltage	0: normal; 1: trigger
6	Module total voltage undervoltage	0: normal; 1: trigger
5	Single core voltage overvoltage	0: normal; 1: trigger
4	Single core voltage undervoltage	0: normal; 1: trigger
3	Single core temperature over temperature	0: normal; 1: trigger
2	Single core temperature under temperature	0: normal; 1: trigger
1	MOSFET Over temperature	0: normal; 1: trigger
0		

System protection status 2:

Bit	Content	Note
7		
6	Charging overcurrent warning	0: normal; 1: trigger
5	Discharge overcurrent warning	0: normal; 1: trigger
4		
3	System failure protection	0: normal; 1: trigger
2		
1		
0		

E.g. :
Send command/send command:
7E 32 30 31 32 34 36 36 32 30 30 30 30 46 44 41 39 0D

Response data/receive data:
7E 32 30 31 32 34 36 30 30 38 30 30 38 30 30 30 30 30 30 30 30 46 43 32 31 0D

3.6.4. Obtaining Interactive Information of Battery Pack System Charge and Discharge Management

- Command

No	1	2	3	4	5	6	7	8	9
Bytes	1	1	1	1	1	2	LENID/2	2	1
format	SOI	VER	ADR	46H	63A	LENGTH	INFO	CHKSUM	EOI

- Response

No	1	2	3	4	5	6	7	8	9
Bytes	1	1	1	1	1	2	LENID/2	2	1
format	SOI	VER	ADR	46H	RTN	LENGTH	INFO	CHKSUM	EOI

INFO: Charge and discharge management value

No	Content	Byte	Note	Accuracy
1	Recommended upper limit of charging voltage/charge voltage limit	2	V	3
2	Recommended lower limit of discharge voltage/discharge voltage limit	2	V	3
3	Charge current limit	2	A	1
4	Maximum discharge current/discharge current limit	2	A	1
5	Charge, discharge status	1	-	-

Charge, discharge status

Bit	Content	Note
7	Charge enable	1: yes; 0: request stop charge
6	Discharge enable	1: yes; 0: request stop discharge
5	Strong charge, charge immediately/charge immediately	1: yes; 0: normal
4	Full charge request	1: yes; 0: normal
3		
2		
1		
0		

E.g. :
Send command/send command:
7E 32 30 31 32 34 36 36 33 30 30 30 30 46 44 41 38 0D

Response data/receive data:
7E 32 30 31 32 34 36 30 30 38 30 30 38 44 43 44 33 35 44 43 30 30 39 43 34 30 37 45 34 42 30 46 39 38 35 0D

Meaning of response data:

No	Content	Data	
1	Recommended upper limit of charging voltage	44 43 44 33	0xDCD3, 56.531V
2	Recommended lower limit of discharge voltage	35 44 43 30	0x5DC0, 24.00V
3	Maximum charging current	30 39 43 34	0x09C4, 25.0A
4	Maximum discharge current	30 37 45 34	0x07E4, 20.2A
5	Charge and discharge state	42 30	0xB0, 1 0 1 1 0 0 0 0

3.6.5. Control the Shutdown Command of the Battery Pack System

Only for the specific needs of the power management system. It will cause to shut down a single battery pack.

- Command

No	1	2	3	4	5	6	7	8	9
Bytes	1	1	1	1	1	2	LENID/2	2	1
format	SOI	VER	ADR	46H	9B	LENGTH	INFO	CHKSUM	EOI

- Response

No	1	2	3	4	5	6	7	8	9
Bytes	1	1	1	1	1	2	LENID/2	2	1
format	SOI	VER	ADR	46H	RTN	LENGTH	INFO	CHKSUM	EOI

E.g. :
Send command/send command:
7E 32 30 31 32 34 36 36 34 30 30 30 30 30 46 44 41 37 0D

Response data/receive data:
7E 32 30 31 32 34 36 30 30 30 30 30 30 46 44 42 31 0D

4. BATTERIES COMPATIBLE WITH THE SUNSYNK HYBRID INVERTERS

The following batteries are compatible with all Sunsynk Hybrid Inverters (three-phase, standard single-phase, rack-mounted, and Lifelynk).

Brand	Model	48V Storage Inverter	RS485 or CAN	Inverter Setup	Notes
DYNESS	B4850	✓	CAN	0	
	POWERBOXF			0	
	A48100			0	
SunketESS	LFP5000	✓	CAN	0	
Osily	LFP5KWH/LV	✓	CAN	0	
HUBBLE	AM-2 5.5KW	✓	CAN	0	
	AM-5		CAN	0	CANH = Pin 4 CANL = Pin 5
	AM-10		CAN	0	
SACRED SUN	SSIF2P15S48100C	✓	RS485	1	Cut Line 3, 6, 8
	FCIFP48100A		RS485	1	
	SSIFP48100A		RS485	1	
SHOTO	SDC-Box5(5.12KWH)	✓	CAN	0	
Photon	PTN-BAT-05K-WM-LFP (5KWh / 100Ah)	✓	CAN	0	CANH = Pin 4 CANL = Pin 5

Brand	Model	48V Storage Inverter	RS485 or CAN	Inverter Setup	Notes
SolarMD	SS4074	✓	CAN	0	To be used with V2 Logger http://solarmd.co.za/inverter-compatibility-solarmd/sunsynk-and-solar-md/
	SS4037			0	
	SS202			0	
	SS4143			0	
	SS4083			0	
	SS214			0	
PYLON	US2000B	✓	CAN	0	
			RS485	12	
	US3000		CAN	0	
			RS485	12	
	US2000C		CAN	0	
			RS485	12	
	US3000C		CAN	0	
			RS485	12	
	UP5000		CAN	0	
			RS485	12	
	US5000		CAN	0	
			RS485	12	
	Force L1		CAN	0	
			RS485	12	
	Force L2		CAN	0	
			RS485	12	
UZ ENERGY	L051100-A	✓	CAN	0	
	L051100-A1		CAN	0	
	L051100-B		CAN	0	
	L051100-D		CAN	0	
GenixGreen	ESS-5120	✓	RS485	6	
	ESS-10240		RS485	6	
	ESS-BOX2		RS485	6	
	ESS-BOX3		RS485	6	
	ESS-BOX4		RS485	6	
	ES-BOX2		RS485	6	
	ES-BOX5		RS485	6	
	ES-BOX12		RS485	6	
Sunwoda	H4850M	✓	CAN	0	
	SunESS		CAN	0	
	Atrix		CAN	0	
APIUM	AP-5	✓	CAN	0	
	APR-5		CAN	0	
VISION Group	V-LFP51.2V100Ah-5KW	✓	CAN	13	
	VLFP51.2V200Ah-5KW		CAN	13	

Brand	Model	48V Storage Inverter	RS485 or CAN	Inverter Setup	Notes
Alpha Ess	M4856-P	✓	CAN	0	
	SMILE BAT		CAN	0	
BYD	BYD Battery-Box LV Flex Lite	✓	CAN	0	
Greenrich	AU5500(UP3686)	✓	CAN	0	
	AU7500(UP5000)			0	
	AU9000(UP6100)			0	
	AW7500(WM5000)			0	
	SSRE-EU10K			0	
TOPBAND	TB51100F-T110	✓	CAN	0	
	TB51120-T110		CAN	0	
Weco	4K4 LV	✓	CAN	0	
	5K3 LV		CAN	0	
GSL ENERGY	GSL051100A-B-GBP2	✓	CAN	0	
	GSL051200A-B-GBP2		CAN	0	
	GSL051280A-B-GBP2		CAN	0	
	ZnP48100ESA1		CAN	0	
	GSL-51-100		CAN	0	
	GSL-51-200		CAN	0	
DOWELL	IPACK C3.3	✓	CAN	0	
	IPACK C6.5		CAN	0	
	IPACK C10		CAN	0	
Giter	G2500-48V	✓	CAN	0	
	G5040-48V		CAN	0	
CF Energy	CFE2400	✓	CAN	0	
	CFE5100		CAN	0	
	CFE5100S		CAN	0	
Deye	SUNB-5.0-G01-48-PC SE-G5.1 PRO/AI-W5.1/ RW-M6.1	✓	CAN	0	
AOBOET	Uhome-LFP 5000	✓	CAN	0	
	Uhome-LFP 2400		CAN	0	
Wattsonic	Li-LV battery series	✓	RS485	14	
KODAK	FL5.2	✓	CAN	0	
Fox ess	LD-48100P	✓	RS485	1	
PYTES Energy	E-BOX 48100R	✓	CAN	0	
BST	MD48-100	✓	CAN	0	
	MD48-50		CAN	0	
Rosen Solar Energy	LFP48V200AH	✓	CAN	0	
	LFP51.2V200AH		CAN	0	
Highstart	HSD4870	✓	CAN	0	

Brand	Model	48V Storage Inverter	RS485 or CAN	Inverter Setup	Notes
BALANCELL	P26	✓	CAN	0	
	P27		CAN	0	
ZRGP	ZR-FC48100-1630J1	✓	CAN	0	
	ZR-FS4850-16OSJ1		CAN	0	
	ZR-FS48100-16OSJ1		CAN	0	
	ZR-PBX1		CAN	0	
UFO	U-P48200-7	✓	CAN	0	
	U-P48100-7		CAN	0	
	U-P48150-1		CAN	0	
DMEGC	L01-48100	✓	CAN	0	
	L02-48200		CAN	0	
Robuste	LR48100	✓	CAN	0	
	LR48200		CAN	0	
Soluna	4K Pack	✓	CAN	0	
	5K Pack		CAN	0	
	EOS-5K Pack		CAN	0	
REVOV	R100	✓	CAN	0	
PAND	Powerfree Rack	✓	CAN	0	
	Powerfree Cube	✓	CAN	0	
CLiS (Zhongneng Lithium Battery Technology Taizhou Co., Ltd.)	Enerhi-M Series	✓	CAN	0	
LBSA	LBSA 51.2V/100Ah	✓	CAN	0	
Freedomwon	Freedomwon Lite Commercial 52V and LV Models	✓	CAN	0	
GSO	GBP48	✓	CAN	0	
Sunketess	LFP5000	✓	CAN	0	
Vestwoods	VT Series	✓	CAN	0	
	VE Series		CAN	0	
Green Solutions Inc.	HOME E10	✓	CAN	0	
nRuiT Energy	PowerPorter 5.0/9.0/10.0/12.0/15.0	✓	CAN	0	
Far East Battery	FEB LV Series	✓	CAN	0	
GEN2	Gen2 P48200-7	✓	CAN	0	
	Gen2 P48100-7		CAN	0	
	Gen2 P48150-1		CAN	0	
LEMAX	LM-JW-51.2V100Ah	✓	CAN	0	
	LM-JW-51.2V200Ah		CAN	0	

Brand	Model	48V Storage Inverter	RS485 or CAN	Inverter Setup	Notes
COOLI	CLR5KWH	✓	CAN	0	
	CLW5KWH		CAN	0	
	CLR10KWH		CAN	0	
	CLW10KWH		CAN	0	
	CLH10KWH		CAN	0	
	ESS10240		CAN	0	
VOLTA	VOLTA STAGE1	✓	CAN	0	
	VOLTA STAGE2		CAN	0	
	VOLTA STAGE3		CAN	0	
	VOLTA STAGE4		CAN	0	
EVO	EVO 5.7KWH 48V-120Ah	✓	CAN	0	
Yoshopo	BB-LFP-100Ah-P	✓	CAN	0	
BNP	51.2V 100Ah	✓	CAN	0	
Shanghai Green Tech Co.,Ltd.	GTEM-48V2500	✓	RS485	12	
Unipower	UPI.FP4845	✓	RS485	15	
LD	LD-100P210J	✓	RS485	17	
Felicity	LPBF Series	✓	RS485	12	
	LPBA-OL Series		RS485	12	
	LPBA-IL Series		RS485	12	
BSL	B-LFP51.2V 100Ah	✓	CAN	0	Float voltage 54.5V Absorption V 55.00V Disable equalisation 0 Days Shutdown 20% Low Batt 35% Restart 50%
	B-FLP51.2V 125Ah				
	B-LFP48-130E 51.2V 130Ah				
	B-LFP48-160E 51.2V 160Ah				
	B-LFP51.2V 200Ah Powerwall				
Enersol Lithium	48-100	✓	CAN	0	BMS cable – straight RJ45 cable (no need to change pin outs on cable) Dip Switch settings is 1000 (for single battery)
	51-100		CAN	0	CANH = Pin 4 CANL = Pin 5
	51-200		CAN	0	
	51-100WM		CAN	0	
	51-200WM		CAN	0	
Blue Nova Rackpower	RacPower BN52-100-5.2K BP	✓	CAN	0	
	RacPower BN52-100-5.2K DU		CAN	0	

Brand	Model	48V Storage Inverter	RS485 or CAN	Inverter Setup	Notes
Blue Nova HC	BN52V-280-14.5K HC	✓	CAN	0	Can be used with or without BMAC
	BN52V-560-29K HC		CAN	0	https://www.bluenova.co.za/wp-content/uploads/2015/11/BN-User-Manual-HC_v102.pdf
	BN52V-840-43.6K HC		CAN	0	
	BN52V-1120-58.2K HC		CAN	0	CANH = Pin 7
	BN52V-1400-72.8K HC		CAN	0	CANL = Pin 8
Blue Nova Rack Series	BN52V-840-43.6K BR	✓	CAN	0	BlueNova-BMAC-Manual-v4.pdf
	BN52V-1120-58.2K BR		CAN	0	

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