

DC Load Bank (LB-CCD Series)

Communication Protocol

1、 Physical Interface

- 1.1 Serial Communications Interface uses RS232 or RS485
- 1.2 Information transmission type is asynchronous transmission; 1 start bit; 8 data bits; 1 parity bit; 1 stop bit. MARK check , address identification code check parity bit is 1; Data identification code check parity bit is 0.
- 1.3 Data transfer rate: 9600

2、 Type of Information and Basic Format of Protocol

2.1 Type of information

- (1) Command information
- (2) Response information

2.2 Basic Format of Protocol

Sequence No.	1	2	3	4	5	6
Description	Device address	Function code	Data length	Data	Accumulate and check-up	End code
Number of bytes	1	1	2	N	2	2

Sequence No.	Function Description	Remarks
1	Device address	(1-254) 0, 255 reserved
2	Control function code	
3	Data length	N depends on specific data
4	Data	
5	Accumulate and check-up	
6	End code	0x0D 0x0A

Control function code:

Set command 0x20---0x2F
Read status 0x30---0x 3F

1. Read Testing Data (Data in memory)

1.1 Read Working Parameter Table

Upper computer sends: (Command Length: 8 bytes)

Sequence No.	1	2	3	4	5	6
Description	Device address	Function code	Data length	Data	Accumulate and check-up	End code
Number of bytes	1	1	2	N	2	2

Sequence No.	Function Description	Remarks
1	Device address	(1-254) 0, 255 reserved
2	Control function code	0x31
3	Data length	0
4	Data	
5	Accumulate and check-up	
6	End code	0x0D 0x0A

Single chip microcomputer return:

Working parameter table

Data Description:

Sequence No.	1	2	2	3	4	5	6
Description	Start bit	Address	Function code	Data length	Data	Accumulate and check-up	End code
Number of bytes	1	1	1	2		2	2

Address	Name	Description	Number of bytes	Remarks
0	reserved	reserved	2	Common part
1	reserved	reserved	2	
2	reserved	reserved	2	
3	Rated capacity	Real value * 1	2	
4	Total voltage upper limit	real value * 100	2	
5	Total voltage lower limit	real value * 100	2	
6	Current upper limit	real value * 10	2	
7	Temperature upper limit	real value * 100	2	
8	reserved	reserved	2	
9	End voltage of cell	real value * 100	2	
10	Data save interval	6—600 (second)	2	
11	externally connect current transformer type	10—300 (Ampere)	2	
12	reserved	reserved	2	charging part
13	reserved	reserved	2	
14	reserved	reserved	2	
15	reserved	reserved	2	
16	reserved	reserved	2	
17	reserved	reserved	2	
18	reserved	reserved	2	
19	reserved	reserved	2	
20	reserved	reserved	2	
21	reserved	reserved	2	
22	reserved	reserved	2	
23	discharging current	real value * 10	2	discharging part
24	discharging duration	high byte is hour, low byte is minute.	2	
25	discharging capacity	real value * 1	2	

26	discharging hour rate	0x0: customize 0x1: 3 hour rate 0x2: 5 hour rate 0x3: 10 hour rate	2	
27	sweep current	real value * 10	2	
28		reserved	2	
29		reserved	2	
30	alarm sound toggle	0 close, 1open	2	
31---32	(extend)	reserved	6	
33	battery positive/ negative selection	reserved	2	
34---36	(extend)	reserved	6	

1.2 Read Real-time Data

Upper computer sends: (Command Length: 8 bytes)

Sequence No.	1	2	3	4	5	6
Description	Device address	Function code	Data length	Data	Accumulate and check-up	End code
Number of bytes	1	1	2	N	2	2

Sequence No.	Function Description	Remarks
1	Device address	(1-254) 0, 255 reserved
2	Control function code	0x30
3	Data length	0
4	Data	
5	Accumulate and check-up	
6	End code	0x0D 0x0A

Single chip return: (command length:)

Sequence No.	1	2	3	4	5	6	7
Description	Start bit	Address	Function code	Data length	Data	Accumulate and check-up	End code
Number of bytes	1	1	1	2	N	2	2

Data:

No.	Name	Description	Number of bytes
1 high byte	status	0x00: stop 0x20: discharge	1
1 low byte	reserved	reserved	1
2--3	Charging /discharging capacity	real value*1;	2
4	Unit current direction	0x55: + charging 0x00: - discharging	2
5	discharging current	real value*10;	2
6	Bus current direction	0x55: + charging 0x00: - discharging	2
7	Bus current	real value*10;	2
8	Temperature 1	real value*100;	2
9	Temperature 2	real value*100;	2
10	Bus voltage	real value*100;	2
11	Battery voltage	real value*100;	2
12 high byte	Real-time alarm sign	0x00: no 0x01: real-time alarm.	1
12 low byte	Reserved sign	Ditto	1
13 high byte	reserved sign	Ditto	1
13 low byte	reserved sign	Ditto	1
14 high byte	reserved sign	Ditto	1
14 low byte	reserved sign	Ditto	1
15	Run duration	high byte: hour; low byte: minute	2

2. Setting

2.1.1 Set Parameter

Upper computer sends: ()

Sequence No.	1	2	3	4	5	
Description	Device address	Function code	Data length	Data	Accumulate and check-up	End code
Number of bytes	1	1	2	N	2	2

Sequence No.	Function Description	Remarks
1	Device address	(1-254) 0, 255 reserved
2	Control function code	0x20
3	Data length	
4	Data	
5	Accumulate and check-up	
6	End code	0x0D 0x0A

Address	Name	Description	Number of bytes	Remarks
0	reserved	reserved	2	Common part
1	reserved	0---255	2	
2	reserved	reserved	2	
3	Rated capacity	real value * 1	2	
4	Total voltage upper limit	real value * 100	2	
5	Total voltage lower limit	real value * 100	2	
6	current upper limit	real value * 10	2	
7	temperature upper limit	real value * 100	2	

8	reserved	reserved	2	
9	End voltage of cell	real value * 100	2	
10	Data save interval	6—600 (second)	2	
11	externally connect current transformer type	10—300 (ampere)	2	
12	reserved	reserved	2	charging part
13	reserved	reserved	2	
14	reserved	reserved	2	
15	reserved	reserved	2	
16	reserved	reserved	2	
17	reserved	reserved	2	
18	reserved	reserved	2	
19	reserved	reserved	2	
20	reserved	reserved	2	
21---22	(extend)	reserved	4	
23	discharging current	real value * 10	2	discharging part
24	discharging duration	high byte is hour, low byte is minute.	2	
25	discharging capacity	real value * 1	2	
26	discharging hour rate	0x0: customize 0x1: 3 hour rate 0x2: 5 hour rate 0x3: 10 hour rate	2	
27	sweep current	real value * 10	2	
28		reserved	2	
29		reserved	2	
30	alarm sound toggle	0 close, 1 open	2	
31---32	(extend)	reserved	6	

Single chip computer returns to Data Form: (command length: 10 bytes)

ID code	Address	Function code	Data length	Data	Accumulate and check-up	End code
0X7E		0x00	0001H			0A0D

Data 01 means wrong reception; Data 00 means correct reception.

2.1.2 Start-stop Setting

Upper computer sends: ()

Sequence No.	1	2	3	4	5	
Description	Device address	Function code	Data length	Data	Accumulate and check-up	End code
Number of bytes	1	1	2	N	2	2

Sequence No.	Function Description	Remarks
1	Device address	(1-254) 0, 255 reserved
2	Control function code	0x21
3	Data length	2
4	Data	
5	Accumulate and check-up	
6	End code	0x0D 0x0A

Data:

Sequence No.	Name	Description	Number of bytes
0	Control command	0X00: stop (ignore parameter) 0X01: start (with parameter)	1
	parameter	0x21: discharging	1

Single chip computer returns to Data Form: (command length: 10 bytes)

ID code	Address	Function code	Data length	Data	Accumulate and check-up	End code
0X7E		0x00	0001H			0D0A

Data 01 means wrong reception; Data 00 means correct reception.

Communication command detail list:
Set (0x 20---0x2F)
Read status (0x 30---0x 3F)

Obtain real-time data of lower computer 0x30—0x3F				
Sequence No.	Information Description	Command Code	Information Description	Command Code
1	Read real-time data	0x30		
2	Read working parameter	0x31		
Set lower computer (0x 20---0x2F)				
Sequence No.	Information Description	Command Code	Information Description	Command Code
6	Set parameter	0x20		
7	Set run and stop	0x21		