

## DC Load Bank (LB-CCS 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 (MARK); 1 stop bit.
- 1.3 Data transfer rate: 9600

#### 2、 Type of Information and Basic Format of Protocol

##### 2.1 Basic Format of Protocol

###### 2.1.1 Basic format of PC sending data

Sequence No.	1	2	3	4	5	6
Description	Device address	Function code	Data length	Data	Checksum	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 Checksum	
6	End code	0x0D 0x0A

###### 2.1.2 Basic Format of Host Return Data

Sequence No.	1	2	3	4	5	6	7
Description	Marking code	Device address	Function code	Data length	Data	Checksum	End code
Number of bytes	1	1	1	2	N	2	2

Sequence No.	Function Description	Remarks
1	Marking code	0x7E
2	Device address	(1-254) 0, 255 reserved
3	Control function code	
4	Data length	N depends on specific data
5	Data	
6	Accumulate and Checksum	
7	End code	0x0D 0x0A

## 1 Main Command

### 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	Checksum	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 checksum	
6	End code	0x0D 0x0A

Single chip microcomputer return:

Sequence No.	1	2	2	3	4	5	6
Description	Marking code	Device Address	Function code	Data length	Data	Checksum	End code
Number of bytes	1	1	1	2	N	2	2

**Working parameter table data description:**

Address	Name	Description	Number of bytes	Remarks
0	Battery type	0x0: 2V 0x1:6V 0x2: 12v 0x3: user-defined	2	
1	Battery number	0-255	2	
2	reserved		2	
3	Rated capacity	Real value * 1	2	
4	Total voltage upper limit	real value * 10	2	
5	Total voltage lower limit	real value * 10	2	
6	reserved		2	
7	Temperature upper limit	real value * 100	2	
8	Cell voltage upper limit	real value * 100	2	
9	Cell voltage lower limit	real value * 100	2	
10	Data save interval	6—600 (second)	2	
11	externally connect current transformer type	10—300 (Ampere)	2	
12	reserved		2	
13	reserved		2	
14	reserved		2	
15	reserved		2	

16	reserved		2	
17	reserved		2	
18	reserved		2	
19	reserved		2	
20	reserved		2	
21	reserved		2	
22	reserved		2	
23	reserved		2	
24	discharging current	real value * 10	2	
25	Discharging duration (hour)	0-99	1	
26	Discharging duration (minute)	0-59	1	
27	Discharging capacity	real value * 1	2	
28	reserved		8	
29	number of activation	1-9	1	
30	alarm sound on/off	00: close, 01: open	1	
31	reserved		2	
32	Number of battery bank	0: 1 bank, 1: 2 banks	1	
33-37	reserved		14	

## 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	Checksum	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	Checksum	
6	End code	0x0D 0x0A

### Single chip return:

Sequence No.	1	2	3	4	5	6	7
Description	Marking code	Device Address	Function code	Data length	Data	Checksum	End code
Number of bytes	1	1	1	2	N	2	2

### Real-time Data Description:

No.	Name	Description	Number of bytes
1	status	0x00: float charge    0x10: charge 0x20: discharge      0x30: cycle 0x40: activation	1
2	reserved		1
3	Charging /discharging capacity	real value*1;	2

4	reserved	real value*1;	2
5	Unit charge/discharge current direction	00: discharge 0x55: charge	2
6	Unit charge/discharge current	real value*10;	2
7	External collecting charge/discharge current direction	00: discharge 0x55: charge	2
8	External collecting charge/discharge current	real value*10;	2
9	Temperature	real value*10;	2
10	reserved		2
11	Voltage	real value*10;	2
12	reserved		2
13	reserved		2
14	reserved		2
15	reserved		2
16	Cumulative time (hour)	Hour	1
17	Cumulative time (minute)	Minute	1
18	Battery type current setting	0: 2V 1:6V 2:12V	2
19-259	Current cell voltage	When 2V 6V, real value*1000; when 12V, real value*100	Each cell 2 bytes*240 cells

## 2. Setting

### 2.1.1 Set Parameter

Upper computer send: ( )

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	Battery type	0x0: 2V/1.2V 0x1: 6V 0x2: 12V 0x3: user-defined	2	
1	Number of cells	0---255	2	
2	reserved		2	
3	Rated capacity	real value * 1	2	
4	Total voltage upper limit	real value * 10	2	
5	Total voltage lower limit	real value * 10	2	
6	Reserved		2	

7	Temperature upper limit	real value * 100	2	
8	Cell voltage upper limit	real value * 100	2	
9	Cell voltage lower limit	real value * 100	2	
10	Data save interval	6—600 (second)	2	
11	externally connect current transformer type	10—300 (ampere)	2	
12	reserved		2	
13	reserved		2	
14	reserved		2	
15	reserved		2	
16	reserved		1	
17	reserved		1	
18	reserved		2	
19	reserved		2	
20	reserved		2	
21	reserved		2	
22	reserved		2	
23	reserved		2	
24	Discharge current	real value * 10	2	
25	Discharging duration (hour)	0-99	1	
26	Discharging duration (minute)	0-59	1	
27	Discharging capacity	real value * 1	2	
28	reserved		8	
29	Activation times	1-9	1	
30	alarm sound toggle	00: close, 01: open	1	
31-37	reserved		2	
	Number of battery bank	0: 1 bank; 1: 2 banks	1	



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

ID code	Address	Function code	Data length	Data	Accumulate and checksum	End code
0X7E		0x00	0001H			0D0A

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

Remarks:

When setting parameters through PC, you must read the working status of the host first. You can set parameters only in floating charging status. Before setting parameters, you must obtain the host parameter table, modify the parameters, then send to host. Don't modify the parameters that don't need to be modified and don't modify the reserved data.

## 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 checksum	End code
Number of bytes	1	1		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	0x10: charge 0x20: discharge 0x30: activate 0x40: cycle	1

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

ID code	Address	Function code	Data length	Data	Accumulate and checksum	End code
0X7E		0x00	0001H			0D0A

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