

MPPT remote communication protocol V1.0

hardware interface: RS485

communication mode: master-slave asynchronous multi-computer communication, the remote upper computer is the master, MPPT is the slave, and the maximum number of MPPT connections on the same bus is 16.

Communication data format:

- 1、 in bytes, 10 bits per byte, including 1 start bit, 8 data bits (low bit first), 1 stop bit (ie 8, n, 1); communication baud rate 1200bps, 2400bps, 4800bps, 9600bps, can be set via MPPT.
2. Each frame of data must be continuously transmitted. There should be at least 3.5 characters before and after a frame of data, and the data should not exceed 1.5 characters. In the program, the interval timeout of 1.5 characters is judged as whether a frame of data is received and the data should be entered. Basis for analysis.
- 3、 Data verification adopts accumulation and verification, and the low byte data is taken as the verification value. The data involved in the check is the entire content of a frame of data (not including the check value itself). The check value is placed in the last byte of a frame of data. In
- 4、 order to simplify the protocol, the communication uses one transmission to exchange data, and each frame of data Fixed length. The format is: address + command + data + accumulative sum check (take the low byte)
5. The communication interval of the remote host computer query MPPT should be greater than or equal to 1 second.

1. Remote host computer query MPPT command: 0XB1

1. The command format sent by remote host computer to MPPT (8 bytes in total):

serial number (Byte)	Data name	value range	definition description	Remarks
0	address	0x01~0XF0	MPPT address	can be on MPPT Set
1	command type	0xB1	query command	
2	control code	0x01	data	
3	data 1	-	meaningless, fill 0	
4	data 2	-	meaningless, fill 0	
5	data 3	-	meaningless, fill 0	
6	data 4	-	meaningless, fill 0	
7	calibration Verification code	0x00~0xFF	Byte0+ Byte 1...+ Byte6	cumulative sum, take the low byte

2, MPPT return data format (93 bytes in total)

serial number (Byte)	data name	value range	definition description	Remarks
0	address	0x01~0xF0	MPPT address	
1	command Type	0xB1	query command	
2	control code	0x01	data	
3	operating	0x00~0xFF	Bit0: operating status	0=normal; 1=abnormal (automatic battery

	status			identification error)
			Bit1: battery status	0=normal; 1=over-discharge protection
			Bit2: fan status	0 =Normal; 1=Fan failure
			Bit3: Temperature status	0=Normal; 1=Over-temperature protection
			Bit4: DC output status	0=Normal; 1=DC output short-circuit protection
			Bit5: Internal temperature 1 status	0=Normal; 1=Fault
			Bit6: Internal temperature 2 status	0=normal; 1=fault
			Bit7: external temperature 1 status	0=normal; 1=fault
4	charging status	0x00~0xFF	Bit 0: charging status	0=stop charging; 1=charging
			Bit 1: equalizing charge	1 valid
			Bit 2: Tracking	1 is valid
			Bit 3: Floating charge	1 is valid
			Bit 4: Charging current limit	1 is valid
			Bit 5: Charging derating	1 is valid
			Bit 6: Remote control prohibits charging	1 is valid
			Bit 7: PV overvoltage	1 is valid
5	Control status	0x00 ~0x07	Bit0: charging output relay	0=off; 1=on
			Bit1: load output	0=off; 1=on
			Bit2: fan	0=off; 1=on
			Bit3: standby	
			Bit4: overcharge protection flag	0=normal, 1= overcharge protection
			Bit5: overvoltage flag	0 = normal, 1 = overvoltage
			Bit6: alternate	
			Bit7:standby	
6	standby	-	-	constant at
07	alternate	-	-	constant at
08	battery type	0x01 ~ 0x03		0, lead-acid Maintenance-free; 1. Lead-acid colloid; 2. Lead-acid liquid; 3. Lithium battery
9	Identification method	0x01~0x02		0, automatic identification; 1. Manual setting (1~8 batteries)
10	Number of batteries	0x01~0x08		1~8 Battery only
11	Load control mode	0x01~0x03		0, off; 1, automatic (output when there is electricity); 2, time control on/off, 3, light control, 4, remote control
12	local address	0x01~0xF0	remote communication Machine address	
13	baud rate	0x01~0x04	remote communication communication rate 1,	1200; 2, 2400; 3, 4800; 4, 96
0014	Standby	-	-	constant at
015	Standby	-	-	constant at
016	the rated voltage level		the high byte of	to take two decimal places, 12.00V, 24.00V, 36.00V, 48.00V
			low byte	
18	each charge upper limit		high byte	take 2 decimals

19	voltage		bytelow	
20	floating		highbytes	
21	voltage limit		the low byte of	FETCH 2 decimals
22	lower limit		byteshigh	
23	discharge voltage of		low byte	FETCH2decimal
24	Hardware maximum charging current limit		high byte	
25			low byte	user-unchangeable parameter, take 2 decimal places
26	maximum charging current limit		high byte	
27			low byte	take 2 decimal places
28	running charging current limit		high byte	
29			low byte	user can't change Take 2 decimal places
30	PV voltage		high byte	
31			low byte	take 1 decimal, for example: 0x0C43=1219, which means PV voltage is 121.9V
32	battery voltage		high byte	
33			low byte	take 2 decimals, for example : 0x14FC=5372, which means the battery voltage is 53.72V
34	charging current		high byte of	
35			low byte	takes 2 decimal places, for example: 0x11E2=4578, which means charging current is 45.78A
36	internal temperature 1		high byte	
37			low byte	takes 1 decimal place, for example: 0x022C=556, which means the temperature is 55.6°C
38	internal temperature 2		high byte	
39			low byte	cancelled
40	external temperature 1		high byte	
41			low byte	format same as internal temperature 1
42	spare	-		Constantly 0
43	standby	-	-	
44	days of power generation			Added total power data for, 4 bytes, high byte first, in watt-hours, this data is invalid if there is no display board
45				
46				
47				
48	total power			Same as above
49				
50				
51				
52	Model code			Manufacturer equipment category Self-encoding
53	Time-controlled output time group flag			Bit0: Time-controlled time group 1 (0=disable, 1=enable) Bit1: Time-controlled time group 2 (0=disable, 1= Enable)
54	Overdischarge		high byte	with 2 decimal places
55			low byte	

	recovery value			
56	battery		high byte	same as above
57	overvoltage protection voltage		low byte	
58	battery		same as	above
59	overvoltage recovery voltage			
60	light		same as above	none Decimal, with V as the unit
61	control on PV voltage			
62	Light		Same as	above
63	control off PV voltage			
64	Delay on	0~999	High byte	in seconds
65	time		Low byte	
66	Delay off	above	Same as	above
67	time as		Same as	
68	Time control 1 on time		When the tens place is	
69			, the ones place is	
70			minutes, the tens place is	
71			minutes, the ones place	
72	is the		same as the above	
73				
74				
75				
76	time control 2 is the		same as the above.	
77				
78				
79				
80	The time control 2 is the		same as the above.	
81				
82				
83				
84	Spare			
85	Spare			
86	Spare			
87	Spare			
88	Spare			
89	Spare			
90	Spare			
91	Spare			
92	Check code	0x00~0xFF	Byte0+ Byte 1...+ Byte91	accumulate and take the low byte

Note:

1. The byte data marked in red is the operating parameter of MPPT , User can set on MPPT; byte data marked in green For running real-time data, the user can select the corresponding data according to actual needs.

2. Example: For example, the user connects 5 MPPTs on the bus, and the addresses are set to 1~5 respectively; when the host computer sends 0x01 0xA1 0x01 0x00 0x00 0x00 0x00 0xA3, it means that the query address is No. 1 MPPT, and the corresponding address is 1. After the MPPT of No. receives the query command and passes the verification, it sends the data shown in Table 2 (52 bytes in total) to the upper computer, and the MPPT of the other addresses does not respond if it is not the local address after receiving the command. (If query No. 3 MPPT format: 0x03 0xA1 0x01 0x00 0x00 0x00 0x00 0xA5, and so on)

2. The remote host computer only queries the setting parameter command: 0XB2

1. The remote host computer sends data format (8 bytes in total)

serial number (Byte)	Data name	value range	definition description	Remarks
0	address	0x01~0XF0	MPPT address	can be set on MPPT
1	command type	0xB2	query setting parameter only command	
2	control code	0x01	data	
3	data 1	-	meaningless, fill 0	
4	data 2	-	meaningless, fill 0	
5	data 3	-	meaningless, fill 0	
6	data 4	-	meaningless, fill 0	
7	check code	0x00~0xFF	Byte0+ Byte 1...+ Byte6	cumulative sum, take the low byte

2, MPPT return data format (total 64 Byte)

Serial Number (Byte)	Data Name	Value Range	Definition Description	Remarks
0	address	0x01~0xF0	MPPT address	
1	command type	0xB2	query setting parameters only command	
2	control code	0x01	data	
3	battery type	0x01~0x03		0, lead-acid maintenance-free; 1, Lead-acid colloid; 2. Lead-acid liquid; 3. Lithium battery
4	Identification method	0x00~0x01		0, automatic identification; 1. Manual setting
5	Battery number	0x01~0x08		1~8 batteries
6	Load control method	0x01~0x03		0, Close ; 1. Automatic (output when there is power); 2. Time control on/off; 3. Light control
7	Local address	0x01~0xF0	Remote communication local address	
8	Baud rate	0x01~0x04	Remote communication communication rate 1,	1200; 2, 2400; 3, 4800; 4, 9600
9 The	rated voltage level		high byte of the	takes 2 decimal places, 12.00V, 24.00V, 36.00V, 48.00V
10			low byte	
11 The	upper average charging voltage		byte of	takes 2 decimal places
12			low byte	
13	floating charge voltage upper limit		high byte	takes 2 decimal places
14			low byte	
15	discharge voltage		high byte	takes 2 decimal places

16	lower limit		low byte	
17	hardware maximum charging current limit		high byte	user-unchangeable parameter, Take 2 decimal places
18			low byte	
19	Maximum charging current limit		high byte	take 2 decimal places
20			low byte	
21	Operating charging current limit		high byte	User-unchangeable parameter, take 2 decimal places
22			low byte	
23	Model code			manufacturer Equipment category self-encoding
24	time control output time group flag			Bit0: time control time group 1 (0=disable, 1=enable) Bit1: time control time group 2 (0=disable, 1=enable)
25	over-discharge recovery value		High byte	takes 2 decimal places
26			Low byte	
27	Battery overvoltage protection voltage		High byte	same as above
28			Low byte	
29	Battery overvoltage recovery voltage		Same as	above
30				
31	Light-controlled turn-on PV voltage		Same as above	without decimals, in V as unit
32				
33	Light control off PV voltage		Same as	above
34				
35	Delay on time	0~999	High byte	in seconds
36			Low byte	
37	Delay off time	same as above	High byte	Same as above
38			Low byte	
39	Time control 1 ontime,		When ten	non-display panel of this invalid data
40			the bits	
41			minutes, ten	
42			minutes, bit	
43	controls an off-time			ditto
44,45,46,47,48	control when on time			ditto

49				
50				
51	time The closing time of control 2 is the		same as	above
52				
53				
54				
55	standby is			always 0
56	standby			
57	standby			
58	standby			
59	standby			
60	standby			
61	standby			
62	standby			
63	Check code	0x00~0xFF	Byte0+ Byte 1...+ Byte62	cumulative sum, take the low byte

3. The remote host computer only queries the real-time data command: 0XB3

1. The remote host computer sends data format (8 bytes in total)

serial number (Byte)	data name	value range	definition description	Remarks
0	address	0x01~0xF0	MPPT address	can be set on MPPT
1	command type	0xB3	only query real-time data command	
2	control code	0x01	data	
3	data 1	-	meaningless, fill 0	
4	data 2	-	meaningless, fill 0	
5	data 3	-	meaningless, fill 0	
6	data 4	-	meaningless, fill 0	
7	check Code	0x00~0xFF	Byte0+ Byte 1...+ Byte6	cumulative sum, take the low byte

2, MPPT return data format (total 37 bytes)

serial number (Byte)	data name	value range	definition description	Remarks
0	address	0x01~0xF0	MPPT address	
1	command type	0XB3	query command	
2	control code	0x01	data	
3	operating status	0x00~0xFF	Bit0: operating status	0=normal; 1=abnormal (automatic battery identification error)
			Bit1: battery status	0=normal; 1=over-discharge protection
			Bit2: fan status	0= Normal; 1=Fan failure
			Bit3: Temperature status	0=Normal; 1=Over-temperature protection
			Bit4: DC output status	0=Normal; 1=DC output short-circuit protection
			Bit5: Internal temperature 1 status	0=Normal; 1=Failure

			Bit6: Internal Temperature 2 status	0=normal; 1=fault
			Bit7: external temperature 1 status	0=normal; 1=fault
4	charging status	0x00~0xFF	Bit 0: charging status	0=stop charging; 1=charging
			Bit 1: equalizing charging	1 valid
			Bit 2: Tracking	1 valid
			Bit 3: Floating charge	1 valid
			Bit 4: Charging current limit	1 valid
			Bit 5: Charging derating	1 valid
			Bit 6: Remote control prohibiting charging	1 valid
			Bit 7: PV overvoltage	1 valid
5	Control status	0x00~ 0x07	Bit0: charging output relay	0=off; 1=on
			Bit1: load output	0=off; 1=on
			Bit2: fan	0=off; 1=on
			Bit3: standby	
			Bit4: overcharge protection flag	0=normal, 1=over Charge protection
			Bit5: Overvoltage protection flag	0=Normal, 1=Overvoltage protection
			Bit6: Spare	
			Bit7: Spare	
6 The	PV voltage		high byte of	takes 1 decimal, for example: 0x0C43=1219, which means the PV voltage is 121.9V
7			Low byte	
8 The	battery voltage		high byte of	takes 2 decimal places, for example: 0x14FC=5372, indicating that the battery voltage is 53.72V
9			low byte	
10	charging current		high byte of	takes 2 decimal places, for example: 0x11E2=4578, indicating charging current is 45.78A
11			low byte	
12	internal temperature 1		high byte	takes 1 decimal, for example: 0x022C = 556, represents the temperature of 55.6 °C
13			lowbyte	
14	the internal temperature of 2		high byte	canceled
15			low byte	
16	outside temperature 1		higherbyte	format with an internal temperature of
117			low byte	
18	spare	-		
--19	standby	-	-	constantof
020,	generating capacity			total newquantity data4 bytes, high byte first, while in watts, without the display panel, this data is not valid
21				
22				
23				
24	total amount			supra
25				
26				
27				
28	Standby is			always 0
29	Standby			
30	Standby			

31	Standby			
32	Standby			
33	Standby			
34	Standby			
35	Standby			
36	Check code	0x00~0xFF	Byte0+ Byte 1...+ Byte35	Cumulative sum, take the low byte

Four, remote host computer control command: 0XC0 (new control command)

1. Data format sent by remote host computer (8 bytes in total)

serial number (Byte)	data name	value range	definition description	Remarks
0	address	0x01~0XF0	MPPT address	can be set on MPPT
1	command type	0xC0	control command	
2	Control code		0x01: charging is allowed; 0x02: charging is prohibited; 0x03: remotely turn on DC output; 0x04: remotely turn off DC output; 0x05: buzzer alarm and silence (retrigger the alarm when a new fault occurs); 0x06: turn on the backlight (1 minute) After closing);	
3	data 1	-	meaningless, fill 0	
4	data 2	-	meaningless, fill 0	
5	data 3	-	meaningless, fill 0	
6	data 4	-	meaningless, fill 0	
7	check code	0x00~0xFF	Byte0+ Byte 1 ...+ Byte6	cumulative sum, take the low byte

2、MPPT return data format,

execute the control command of the host computer, and return the received control command data as it is.

5. Parameter setting command: 0XD0 (new command)

1. Data format sent by remote host computer (8 bytes in total)

serial number (Byte)	data name	value range	definition description	Remarks
0	address	0x01~0XF0	MPPT address	can be set on MPPT
1	Command type	0xD0	parameter setting command	
2	parameter code	0x01~0xFF	parameter code, representing parameters for different purposes. The parameter	code followed by 1~4 bytes is the data that needs to be set, and the effective byte of 1 byte of data is data 4; 2 bytes Data valid byte is data 3,4; 4-byte data valid byte is data 1, 2, 3, 4; data larger than 1 byte is high byte first.
			0x09: Setbattery type	1 byte of data, data 1, 2, 3 are meaningless, fill with 0. 0=Lead-acid maintenance-free,

			1=Lead-acid colloid, 2=Lead-acid liquid, 3=Lithium battery
		0x0A: Battery rated voltage setting	1 byte data 0=Automatic identification, with lead-acid battery 12V each as standard, 1=12V ,2=24V and so on.
		0x0C: DC output control mode	1 byte data, data 1, 2, 3 are meaningless, fill in 0. 0=off, 1=automatic, 2=time control, 3=light control, 4= Remote control
		0x11: controller model code	1 byte data, 1~255, representing different models
		0x12: time control time group flag	1 byte data Bit0: time control flag of time group 1, 0=prohibit, 1=enable Bit1: Time control flag of time group 2, 0=disable, 1=on, no display board setting is invalid
		0x21: equalizing charge voltage	2 bytes parameter, data 3 high byte, data 4 low byte, data 1, 2 are meaningless, Fill in 0; with 2 valid decimals, the battery type is set to lithium battery charging voltage setting invalid. The setting is invalid in the automatic recognition state.
		0x22: Floating charge voltage is the	same as above
		0x23: Battery low-voltage protection voltage is the	same as above
		0x25: The maximum charging current	format is the same as above, and the set maximum value cannot exceed the maximum hardware current limit
		0x26: Low voltage recovery voltage is the	same as above
		0x27: Battery overvoltage protection voltage is the	same as above
		0x28: Battery is over Voltage recovery voltage is the	same as above
		0x29: Light control turn on PV voltage	2 bytes parameter, no decimal, maximum value 999
		0x2A: Light control turn off PV voltage	Same as above
		0x2B: Delay turn on time	2 bytes parameter, in seconds, in light control mode After PV reaches the set voltage, the delay time to turn on the DC output, the maximum value is 999
		0x2C: The delay off time is the	same as above
		0x2D: Time control 1 turn on time	4 bytes parameter, data 1: tens digit, data 2 digits, data 3 Minutes tens place, data 4 minutes ones place, invalid setting without display board.
		0x2E: Time control 1 closing time is the	same as above
		0x2F: Time control 2 opening time is the	same as above
		0x30: Time control 2 closing	same as above

			time is the	
3	Data 1	High byte The		number of data carried by different commands is different, divided into 1, 2, 4 bytes of data, Data larger than 1 byte are high byte first
4	data 2			
5	data 3			
6	data 4	low byte		
7	check code	0x00~0xFF	Byte0+ Byte 1...+ Byte6	cumulative sum, take the low byte

2、MPPT to return the data format (correct Setting)

Execute the command to write the model code from the host computer, and return the received data as it is.

3. MPPT error return (8 bytes in total)

serial number (Byte)	data name		value range	definition description	Remarks
0	address		0x01~0XF0	MPPT address	can be set on MPPT
1	error return		0xEE	error return	
2	error code			0x01: the current state cannot complete the operation 0x02: unrecognized parameter code 0x03: parameter data overflow	
3	original command code				wrong command code
4	original control code				wrong control code
5	spare	-			
6	spare	-			
7	check code		0x00~0xFF	Byte0+ Byte 1...+ Byte6	cumulative sum, Take low byte

5. Remote host computer setting baud rate command: 0xDE

1. Remote host computer sends data format (8 bytes in total)

serial number (Byte)	data name	value range	definition description	note
0	address	0x00	group control address, same bus All devices perform this operation, and there is no return data. The	host computer can send this command at 4 acceptable communication rates in time-sharing to change the communication rate of the devices on the same bus, so that all devices are set to the same rate.
1	Command type	0xDE	Set baud rate Command	
2	Control Code	0x42	Control Code	
3	Data 1	0x01~0x04	Baud Rate Code	1=1200, 2=2400, 3=4800,=9600bps
4	Data 2	-	meaningless, fill 0	
5	Data 3	-	meaningless, fill 0	

6	Data 4	-	meaningless, fill with 0	
7	Check code		Byte0+ Byte 1...+ Byte6	Accumulation and check

2. The return data format has no return data.

6. Clock setting command: 0XDF (new command)

1. The remote host computer sends data format (8 bytes in total)

serial number (Byte)	data name	value range	definition description	Remarks
0	address	0x01~0xF0	0x00,0x00 is group control, the same All bus controllers accept the command does not return data	may be provided in MPPT:
a	command type	0XDF	real time clock command set	
second	the control code		in (and ten bits)	Example 0x12 represents
2018	data		January	
4	data		2	
5	data			
3:06	4 data		points	
7	checksum		0x00 ~ 0xFF Byte0 + byte 1 ...	and accumulation, take low byte

2, MPPT returns the data format group control does not return, the address 0x01 ~ 0xF0 is returned as

revision 2018.10.22