

LS-BPL、Tracer-BPL、DCCP-DPR Series Controller

Communication Instruction

Modbus is an application layer packet transmission protocol and it lies in 7 layer of OSI model. It provides client / server communication between the different network equipment. Modbus is also a request / response protocol, and provides the services of function code.

As a master / slave protocol, at the same time, there is only one master and one or more (Max 247) slave on the bus. Modbus communication is always initiated by the master, and if no request is received from the master to the slave, no data will be sent. The slaves can not communicate with each other, at the same time the master can only initiate one Modbus transaction.

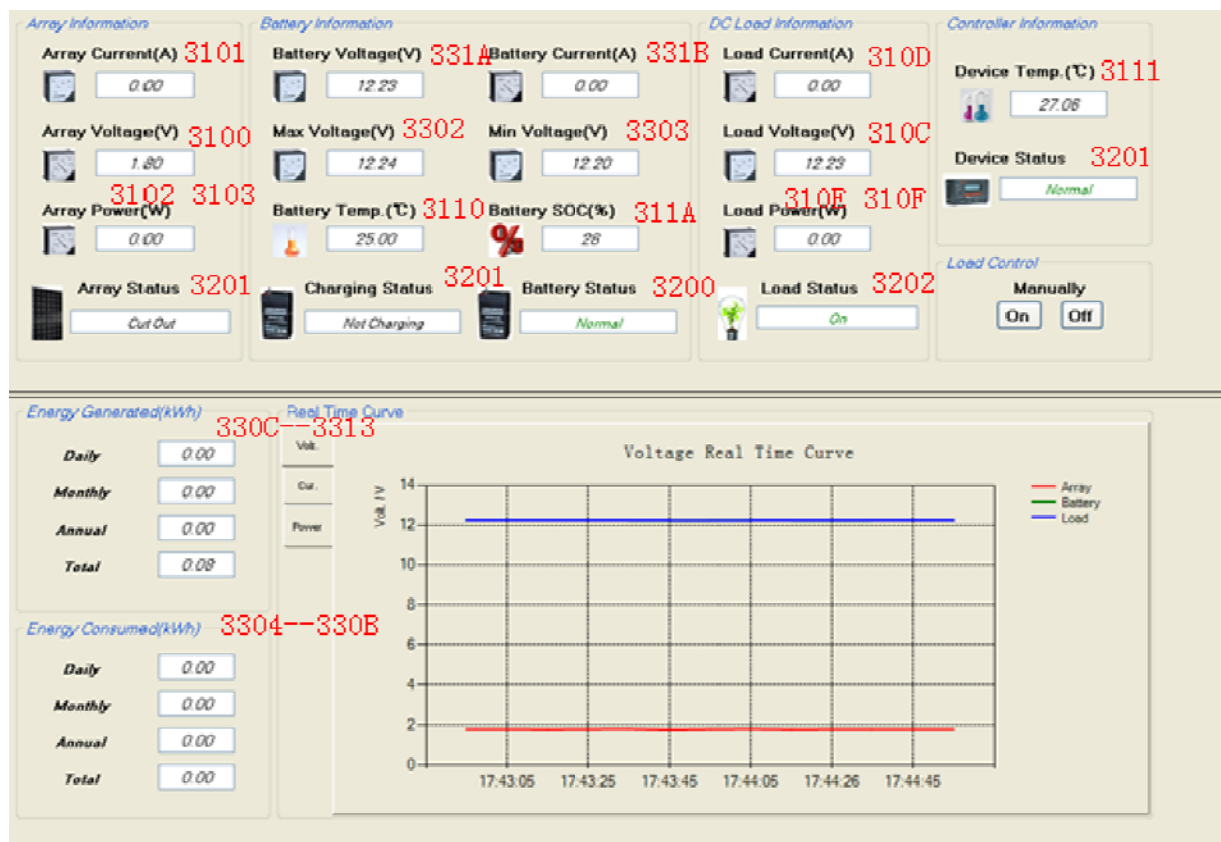
Our product communication protocol has the following characteristics :

1. Communication protocol is standard Modbus-RTU protocol.
2. The default controller ID number is "1", we can modify the ID via PC common software or MT50 LCD unit (Tips: when modify ID, please make sure the bus only connects a controller. After modifying the ID, please recharge the controller.)
3. Serial communication parameters: baud rate 115200, data bits 8, stop bits 1, no data flow control.
4. Register address uses hexadecimal format, the base address offset is

0x00.

5. All 32-bit-length data uses two 16-bit registers to represent (L and H register, respectively), for example, the value of the array rated power is 3000, data multiple is 100, the data of L register (address 0x3002) is 0x93E0 and the data of H register (address 0x3003) is 0x0004.

Real Time Data : all system's real time data , real time status and the history statistics of energy generated and energy consumed.



Number	Variable name	Address	Function code	Description	Unit	Times
A1	Over temperature inside the device	2000	02 (read)	1 The temperature inside the controller is higher than the over-temperature protection point. 0 Normal		1
A2	Day/Night	200C	02 (read)	1-Night , 0-Day		1
A3	PV array input voltage	3100	04 (read)	Solar charge controller--PV array voltage	V	100

A4	PV array input current	3101	04 (read)	Solar charge controller--PV array current	A	100
A5	PV array input power L	3102	04 (read)	Solar charge controller--PV array power	W	100
A6	PV array input power H	3103	04 (read)	Solar charge controller--PV array power	W	100
A7	Load voltage	310C	04 (read)	Load voltage	V	100
A8	Load current	310D	04 (read)	Load current	A	100
A9	Load power L	310E	04 (read)	Load power	W	100
A10	Load power H	310F	04 (read)	Load power	W	100
A11	Battery temperature	3110	04 (read)	Battery temperature	°C	100
A12	Device temperature	3111	04 (read)	Device temperature	°C	100
A13	Battery SOC	311A	04 (read)	The percentage of battery's remaining capacity	%	1
A14	Battery's real rated voltage	311D	04 (read)	Current system rated voltage. 1200, 2400, 3600, 4800 represent 12V , 24V , 36V , 48V	V	100
A15	Battery status	3200	04 (read)	D15: 1-Wrong identification for rated voltage D8: Battery inner resistance		1

				<p>abnormal 1,</p> <p>normal 0</p> <p>D7-D4: 00H Normal, 01H Over Temp.(Higher than the warning settings), 02H Low Temp.(Lower than the warning settings),</p> <p>D3-D0: 00H Normal ,01H Over Voltage. , 02H Under Voltage, 03H Over discharge, 04H Fault</p>		
A16	Charging equipment status	3201	04 (read)	<p>D15-D14: Input voltage status.</p> <p>00H normal, 01H No input power connected, 02H Higher input voltage , 03H Input voltage error.</p> <p>D13: Charging MOSFET is short circuit.</p> <p>D12: Charging or Anti-reverse MOSFET is open circuit.</p> <p>D11: Anti-reverse MOSFET is short circuit.</p> <p>D10: Input is over current.</p> <p>D9: The load is over current.</p>		1

				<p>D8: The load is short circuit.</p> <p>D7: Load MOSFET is short circuit.</p> <p>D6 : Disequilibrium in three circuits.</p> <p>D5 : LED load open circuit.</p> <p>D4: PV input is short circuit.</p> <p>D3-D2: Charging status. 00H No charging,01H Float,02H Boost, 03H Equalization.</p> <p>D1: 0 Normal, 1 Fault.</p> <p>D0: 1 Running, 0 Standby.</p>		
A17	Discharging equipment status	3202	04 (read)	<p>D15-D14: 00H Input voltage normal, 01H Input voltage low, 02H Input voltage high, 03H no access.</p> <p>D13-D12: Output power. 00H Light load, 01H Moderate, 02H rated, 03H overload</p> <p>D11: Short circuit</p> <p>D10: Unable to discharge</p> <p>D9: Unable to stop discharging</p>		1

				D8: Output voltage abnormal D7: Input over voltage D6: Short circuit in high voltage side D5: Boost over voltage D4: Output over voltage D1: 0 Normal, 1 Fault. D0: 1 Running, 0 Standby.		
A18	Maximum battery voltage today	3302	04 (read)	00: 00 Refresh every day	V	100
A19	Minimum battery voltage today	3303	04 (read)	00: 00 Refresh every day	V	100
A20	Consumed energy today L	3304	04 (read)	00: 00 Clear every day	KW H	100
A21	Consumed energy today H	3305	04 (read)		KW H	100
A22	Consumed energy this month L	3306	04 (read)	00: 00 Clear on the first day of month	KW H	100
A23	Consumed energy this	3307	04 (read)		KW H	100

	month H					
A24	Consumed energy this year L	3308	04 (read)	00: 00 Clear on 1, Jan	KW H	100
A25	Consumed energy this year H	3309	04 (read)		KW H	100
A26	Total consumed energy L	330A	04 (read)		KW H	100
A27	Total consumed energy H	330B	04 (read)		KW H	100
A28	Generated energy today L	330C	04 (read)	00: 00 Clear every day.	KW H	100
A29	Generated energy today H	330D	04 (read)		KW H	100
A30	Generated energy this month L	330E	04 (read)	00: 00 Clear on the first day of month.	KW H	100
A31	Generated energy this month H	330F	04 (read)		KW H	100
A32	Generated	3310	04 (read)	00: 00 Clear on 1, Jan.	KW	100

	energy this year L				H	
A33	Generated energy this year H	3311	04 (read)		KW H	100
A34	Total generated energy L	3312	04 (read)		KW H	100
A35	Total generated energy H	3313	04 (read)		KW H	100
A36	Battery voltage	331A	04 (read)	Battery voltage	V	100
A37	Battery current L	331B	04 (read)	Battery current	A	100
A38	Battery current H	331C	04 (read)	Battery current	A	100

Status analysis

Array status : address 3201 bits D15-D10

Charging status : address 3201 bits D3-D2

Battery status : address 3200 bits D7-D0

Load status : address 3201 bits D9-D7, D5 address 3202 bits D13-D8, D6-D4

Device status : address 3200 bit D15 address 3201 bits D6-D5 address 2000

For example

Read real-time battery voltage

Send command : 01 04 33 1A 00 01 1F 49

Analysis :

01	device ID
04	function code
33 1A	the start bit of the address
00 01	the number of the address
1F 49	CRC

Receive command : 01 04 02 04 CE 3A 64

Analysis :

01	device ID
04	function code
02	two bytes
04 CE	data (0x04CE (Hex) = 1230 (Dec), $1230/100=12.3V$)
3A 64	CRC

Battery Parameter : After choosing the battery type, set the corresponding parameter, and mainly set the reasonable parameter to the special voltage.

Station Name Device ID

311D Rated Voltage(V) 300E Rated Load Current(A) 3005 Rated Charging Current(A)

	Default	Current		Default	Current
9000 Battery Type	Sealed	User	9067 Rated Voltage Level	12V	12V
9070 Charging Mode	Volt. Comp.	Volt. Com	906C Boost Duration(m)	120	120
9001 Battery Capacity(Ah)	200	200	906B Equilibrium Duration(m)	120	120
9002 Temp. Compensation Coefficient (mV/°C/2V)	-3	-2			
9003 Over Volt. Disconnect Volt. (V)	16.00	15.40	9004 Charging Limit Voltage(V)	15.00	14.60
9005 Over Volt. Reconnect Volt. (V)	15.00	14.60	900E Discharging Limit Volt. (V)	10.60	9.50
9006 Equilibrium Charging Volt. (V)	14.60	14.60	900D Low Volt. Disconnect Volt. (V)	11.10	10.10
9007 Boost Charging Volt. (V)	14.40	14.60	900A Low Volt. Reconnect Volt. (V)	12.60	11.10
9008 Float Charging Volt. (V)	13.80	14.50	900C Under Volt. Warning Volt. (V)	12.00	11.00
9009 Boost Recon. Charge Volt. (V)	13.20	13.50	900B Under Volt. Warn. Reco. Volt. (V)	12.20	11.20
906E Battery Charge (%)	100	100	906D Battery Discharge (%)	30	80

Read Update Restore Default Export Settings Import Settings

Nu mbe r	Variable name	Addr ess	Function code	Description	Unit	Time s
B1	Battery rated current	3005	04(read)	Rated current to battery	A	100
B2	Rated load current	300E	04(read)	Rated current to load	A	100
B3	Battery's real rated voltage	311D	04(read)	Current system rated voltage. 1200, 2400, 3600, 4800 represent 12V ,	V	100

				24V , 36V , 48V		
B4	Battery type	9000	03 (read) 10 (write)	0000H User defined, 0001H Sealed , 0002H GEL, 0003H Flooded,		1
B5	Battery capacity	9001	03 (read) 10 (write)	Rated capacity of the battery	AH	1
B6	Temperature compensatio n coefficient	9002	03 (read) 10 (write)	Range 0-9	mV/ °C /2V	100
B7	Over voltage disconnect voltage	9003	03 (read) 10 (write)		V	100
B8	Charging limit voltage	9004	03 (read) 10 (write)		V	100
B9	Over voltage reconnect voltage	9005	03 (read) 10 (write)		V	100
B10	Equalize charging voltage	9006	03 (read) 10 (write)		V	100
B11	Boost	9007	03 (read)		V	100

	charging voltage		10 (write)			
B12	Float charging voltage	9008	03 (read) 10 (write)		V	100
B13	Boost reconnect charging voltage	9009	03 (read) 10 (write)		V	100
B14	Low voltage reconnect voltage	900A	03 (read) 10 (write)		V	100
B15	Under voltage warning recover voltage	900B	03 (read) 10 (write)		V	100
B16	Under voltage warning voltage	900C	03 (read) 10 (write)		V	100
B17	Low voltage	900D	03 (read)		V	100

	disconnect voltage		10 (write)			
B18	Discharging limit voltage	900E	03 (read) 10 (write)		V	100
B19	Battery rated voltage level	9067	03 (read) 10 (write)	0, auto recognize. 1-12V, 2-24V ,3-36V , 4-48V , 5-60V , 6-110V , 7-120V , 8-220V , 9-240V		1
B20	Default load On/Off in manual mode	906A	03 (read) 10 (write)	0-off, 1-on		1
B21	Equalize duration	906B	03 (read) 10 (write)	Usually 60-120 minutes	Min	1
B22	Boost duration	906C	03 (read) 10 (write)	Usually 60-120 minutes	Min	1
B23	Battery discharge	906D	03 (read) 10 (write)	Usually 20%-80%. The percentage of battery's remaining capacity when stop charging	%	1
B24	Battery charge	906E	03 (read) 10 (write)	Depth of charge, 100%	%	1
B25	Charging mode	9070	03 (read) 10 (write)	Management modes of battery charge and discharge, voltage compensation : 0		1

				and SOC : 1		
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Voltage parameters limit condition

1. Over voltage disconnect voltage > Charge limit voltage ≥ Equalize charging voltage ≥ Boost charging voltage ≥ Float charging voltage > Boost reconnect charging voltage
2. Over voltage disconnect voltage > Over voltage reconnect voltage
3. Boost reconnect charging voltage > Low voltage reconnect voltage > Low voltage disconnect voltage ≥ Discharging limit voltage
- 4 Under voltage warning recover voltage > Under voltage warning voltage ≥ Discharging limit voltage

Warning

- 1 When the battery type is Sealed、 Gel or Flooded, the customer only can set charging mode、 battery capacity、 temperature compensation coefficient、 equalize duration、 boost duration (you can not set the Equalize duration when the battery type is Gel) . Only when the battery type is User, the customer can set the other parameters (the parameters need to be set at the same time)
- 2 Battery discharge and battery charge can be set when the charging mode is SOC
- 3 The battery type and battery rated voltage level can not be User and Self-recognition at the same time.

For example :

Read battery parameter (battery type: user rated voltage level: 12V)

Send command : 01 03 90 00 00 0F 28 CE

Analysis :

01	device ID
03	function code
90 00	the start bit of the address
00 0F	the number of the address
28 CE	CRC

Receive command : 01 03 1E 00 00 00 C8 01 2C 06 40 05 DC 05 DC 05 B4 05 A0 05 64 05 28 04 EC

04 C4 04 B0 04 56 04 24 72 A5

Analysis : :

01	device ID
03	function code
1E	the number of the sending data
00 00	the sending data (00 00 battery type(User)
00 C8	00 C8 battery capacity(200)
01 2C	01 2C temperature compensation coefficient(3)
06 40	06 40 Over voltage disconnect voltage(16V)
05 DC	05 DC Charge limit voltage(15V)
05 DC	05 DC Over voltage reconnect voltage(15V)
05 B4	05 B4 Equalize charging voltage(14.6V)
05 A0	05 A0 Boost charging voltage(14.4V)
05 64	05 64 Float charging voltage(13.8V)
05 28	05 28 Boost reconnect charging voltage(13.2V)
04 EC	04 EC Low voltage reconnect voltage(12.6V)
04 C4	04 C4 Under voltage warning recover voltage(12.2V)

04 B0	04 B0 Under voltage warning voltage(12V)
04 56	04 56 Low voltage disconnect voltage(11.1V)
04 24	04 24 Discharging limit voltage(10.6V)
3C C4	CRC

Send command : 01 03 90 67 00 01 18 D5

Analysis :

01	device ID
03	function code
90 67	the start bit of the address
00 01	the number of the address
18 D5	CRC

Receive command : 01 03 02 00 01 79 84

Analysis :

01	device ID
03	function code
02	the number of the sending data
00 01	the sending data (12V system)
79 84	CRC

Send command : 01 03 90 6B 00 02 98 D7

Analysis :

01	device ID
03	function code
90 6B	the start bit of the address

00 02 the number of the address

98 D7 CRC

Receive command : 01 03 04 00 78 00 78 7A 08

Analysis :

01 device ID

03 function code

04 the number of the sending data

00 78 00 78 the sending data (00 78 equalize duration(120Min) 00 78
boost duration (120Min)

7A 08 CRC

Write battery parameter (battery type: user note: the address from 9003 to 900e must be set either at the same time or to divide into 9003-9008, 9009-900e, other method is invalid.)

Send command : 01 10 90 00 00 01 02 00 00 36 59

Analysis :

01 device ID

10 function code

90 00 the start bit of the address

00 01 the number of the address

02 the number of bytes

00 00 the sending data

36 59 CRC

Receive command : 01 10 90 00 00 01 2C C9

Analysis :

01	device ID
10	function code
90 00	the start bit of the address
00 01	the number of the address
2C C9	CRC

Send command : 01 10 90 02 00 01 02 01 2C 37 F6

Analysis :

01	device ID
10	function code
90 02	the start bit of the address
00 01	the number of the address
02	the number of bytes
01 2C	the sending data
37 F6	CRC

Receive command : 01 10 90 02 00 01 8D 09

Analysis :

01	device ID
10	function code

90 02	the start bit of the address
00 01	the number of the address
8D 09	CRC

Send command : 01 10 90 6B 00 02 04 00 78 00 78 98 09

Analysis :

01	device ID
10	function code
90 6B	the start bit of the address
00 02	the number of the address
04	the number of bytes
00 78 00 78	the sending data
98 09	CRC

Receive command : 01 10 90 6B 00 02 1D 14

Analysis :

01	device ID
10	function code
90 6B	the start bit of the address
00 02	the number of the address
1D 14	CRC

Send command : 01 10 90 03 00 0C 18 06 40 05 DC 05 DC 05 B4 05 A0 05 64 05 28 04 EC 04 C4 04 B0

04 56 04 24 6F 11

Analysis :

01	device ID
10	function code
90 03	the start bit of the address
00 0C	the number of the address
18	the number of bytes
06 40 05 DC 05 DC 05 B4	
05 A0 05 64 05 28 04 EC	
04 C4 04 B0 04 56 04 24	the sending data
6F 11	CRC

Receive command : 01 10 90 03 00 0C 1D 0C

Analysis :

01	device ID
10	function code
90 03	the start bit of the address
00 0C	the number of the address
1D 0C	CRC

Send command : 01 10 90 67 00 01 02 00 01 FF 8E

Analysis :

01	device ID
10	function code

90 67	the start bit of the address
00 01	the number of the address
02	the number of bytes
00 01	the sending data
FF 8E	CRC

Receive command : 01 10 90 67 00 01 9D 16

Analysis :

01	device ID
10	function code
90 67	the start bit of the address
00 01	the number of the address
9D 16	CRC

Write battery parameter (battery type: non-user)

Send command : 01 10 90 00 00 01 02 00 01 F7 99

Analysis :

01	device ID
10	function code
90 00	the start bit of the address
00 01	the number of the address
02	the number of bytes
00 01	the sending data

F7 99

CRC

Receive command : 01 10 90 00 00 01 2C C9

Analysis :

01	device ID
10	function code
90 00	the start bit of the address
00 01	the number of the address
2C C9	CRC

Send command : 01 10 90 02 00 01 02 01 2C 37 F6

Analysis :

01	device ID
10	function code
90 02	the start bit of the address
00 01	the number of the address
02	the number of bytes
01 2C	the sending data
37 F6	CRC

Receive command : 01 10 90 02 00 01 8D 09

Analysis :

01	device ID
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10	function code
90 02	the start bit of the address
00 01	the number of the address
8D 09	CRC

Send command : 01 10 90 6B 00 02 04 00 78 00 78 98 09

Analysis :

01	device ID
10	function code
90 6B	the start bit of the address
00 02	the number of the address
04	the number of bytes
00 78 00 78	the sending data
98 09	CRC

Receive command : 01 10 90 6B 00 02 1D 14

Analysis :

01	device ID
10	function code
90 6B	the start bit of the address
00 02	the number of the address
1D 14	CRC

Send command : 01 10 90 67 00 01 02 00 01 FF 8E

Analysis :

01	device ID
10	function code
90 67	the start bit of the address
00 01	the number of the address
02	the number of bytes
00 01	the sending data
FF 8E	CRC

Receive command : 01 10 90 67 00 01 9D 16

Analysis :

01	device ID
10	function code
90 67	the start bit of the address
00 01	the number of the address
9D 16	CRC

Load parameter : set the load control mode to meet the customer's demand

LED Load Config

Station Name: Device ID:

Rated Parameter
 Output Current (A): Output Voltage (V): Output Power (W):

Rated Parameter Config
 Led Rated Current (A):

Load Control Mode ☒ 903D

0000H
☒ Manually On By Default 906A ☐ Manually Off By Default 9045--9047
☐ Timing Control 9042--9044 9048--904A
 Turn-On Time1: Turn-Off Time1:
 Turn-On Time2: Turn-Off Time2:
☐ Light On 901E 901F
 Turn-On Volt. (V): Delay (m):
 Turn-Off Volt. (V): Delay (m):
☐ Light On + Time Model 907A 907B 907C
 Work Time1: Work Time2: Work Time3:
☐ Light On + Time Mode2 903E 903F 9040
 Work Time1: Work Time2: Work Time3:
 Night Time On: 9065
☐ Battery Under Voltage Control 9072
 (Return to normal mode when recovery from under voltage)
 LED Rated Current Percentage: %
 9080 9081 907D 907E 907F 905A 905B 905C 9073

Read Update Export Settings Import Settings

Num ber	Variable name	Addr ess	Function code	Description	Unit	Time s
C1	Manual control the load	2	05 (write)	When the load is manual mode , 1-manual on 0 -manual off		1
C2	Night time threshold voltage(NTT V)	901E	03 (read) 10 (write)	PV voltage is lower than this value, controller would detect it as sundown	V	100

C3	Light signal startup (night) delay time	901F	03 (read) 10 (write)	PV voltage is lower than NTTV, and duration exceeds the Light signal startup (night) delay time, controller would detect it as night time.	Min	1
C4	Day time threshold voltage(DTT V)	9020	03 (read) 10 (write)	PV voltage is higher than this value, controller would detect it as sunrise	V	100
C5	Light signal close (day) delay time	9021	03 (read) 10 (write)	PV voltage higher than DTTV, and duration exceeds the Light signal close (day) delay time, controller would detect it as day time.	Min	1
C6	Load control mode	903D	03 (read) 10 (write)	0000H Manual Control 0001H Light ON/OFF 0002H Light ON+ Timer2 0003H Timing Control 0004H Light ON+ Timer1		1
C7	Light on+time2 timing 1	903E	03 (read) 10 (write)	D15-D8,hour, D7-D0, minute		1
C8	Light on+time2	903F	03 (read) 10 (write)	D15-D8, hour, D7-D0, minute		1

	timing 2					
C9	Light on+time2 timing 3	9040	03 (read) 10 (write)	D15-D8, hour, D7-D0, minute		1
C10	Timing control (turn on time1)	9042	03 (read) 10 (write)	Turn on/off time of load output.	S	1
C11		9043	03 (read) 10 (write)		Min	1
C12		9044	03 (read) 10 (write)		H	1
C13	Timing control (turn off time1)	9045	03 (read) 10 (write)		S	1
C14		9046	03 (read) 10 (write)		Min	1
C15		9047	03 (read) 10 (write)		H	1
C16	Timing control (turn on time2)	9048	03 (read) 10 (write)		S	1

C17		9049	03 (read) 10 (write)		Min	1
C18		904A	03 (read) 10 (write)		H	1
C19	Timing control (turn off time2)	904B	03 (read) 10 (write)		S	1
C20		904C	03 (read) 10 (write)		Min	1
C21		904D	03 (read) 10 (write)		H	1
C22	Light on + time2 LED rated current percentage1	905A	03 (read) 10 (write)			100
C23	Light on+ time2 LED rated current percentage2	905B	03 (read) 10 (write)			100
C24	Light on+	905C	03 (read)			100

	time2 LED rated current percentage3		10 (write)			
C25	Night time	9065	03 (read) 10 (write)	Set default values of the whole night length of time. D15-D8,hour, D7-D0, minute		1
C26	Timing control (time choose)	9069	03 (read) 10 (write)	Record the chose time. 0 , one time, 1 two times, and so on		1
C27	Default load On/Off in manual mode	906A	03 (read) 10 (write)	0-off , 1-on		1
C28	Battery under voltage control	9072	03 (read) 10 (write)	0000H unable FFFFH enable		1
C29	Battery under voltage control	9073	03 (read) 10 (write)			100

	percentage					
C30	LED rated current	9078	03 (read) 10 (write)			100
C31	Light on+time1 timing 1	907A	03 (read) 10 (write)	D15-D8, hour, D7-D0, minute		1
C32	Light on+time1 timing 2	907B	03 (read) 10 (write)	D15-D8, hour, D7-D0, minute		1
C33	Light on+time1 timing 3	907C	03 (read) 10 (write)	D15-D8, hour, D7-D0, minute		1
C34	Light on+ time1 LED rated current percentage1	907D	03 (read) 10 (write)			100
C35	Light on+ time1 LED rated current percentage2	907E	03 (read) 10 (write)			100

C36	Light on+ time1 LED rated current percentage3	907F	03 (read) 10 (write)			100
C37	Timing control 1 LED rated Current percentage	9080	03 (read) 10 (write)			100
C38	Timing control 2 LED rated Current percentage	9081	03 (read) 10 (write)			100

Warning

1 first you should choose load control mode(903D), then select the correspond parameter.

2 Timing control (turn on/off time 2) is based on Timing control (time choose) (9069)

3 the address from 901E to 9021 must be set at the same time.

For example

Send light on + time 1

Send command : 01 10 90 3d 00 01 02 00 04 33 77

Analysis :

01	device ID
10	function code
90 3D	the start bit of the address
00 01	the number of the address
02	two bytes
00 04	the sending data (00 04 light ON + time 1)
33 77	CRC

Receive command : 01 10 90 3d 00 01 BD 05

Analysis :

01	device ID
10	function code
90 3D	the start bit of the address
00 01	the number of the address
BD 05	CRC

Send command : 01 10 90 1E 00 04 08 01 F4 00 0A 02 58 00 0A B3 6D

Analysis :

01	device ID
10	function code
90 1E	the start bit of the address
00 04	the number of the address
08	eight bytes
01 F4 00 0A 02 58 00 0A	the sending data (01 F4 night time threshold voltage(5V)
	00 0A light signal startup (night) delay time(10 minute)

02 58 day time threshold voltage(6V) 00 0A light signal

close (day) delay time(10 minute))

B3 6D

CRC

Receive command : 01 10 90 1E 00 04 8C CC

Analysis :

01

device ID

10

function code

90 1E

the start bit of the address

00 04

the number of the address

8C CC

CRC

Send command : 01 10 90 7A 00 03 06 02 00 02 00 02 00 38 B3

Analysis :

01

device ID

10

function code

90 7A

the start bit of the address

00 03

the number of the address

06

six bytes

02 00 02 00 02 00

the sending data (02 00 light on+time1 timing 1,02 00 light

on+time1 timing 2,02 00 light on+time1 timing 3)

38 B3

CRC

Receive command : 01 10 90 7A 00 03 8C D1

Analysis :

01

device ID

10	function
90 7A	the start bit of the address
00 03	the number of the address
8C D1	CRC

Send command : 01 10 90 7D 00 03 06 27 10 1F 40 13 88 44 11

Analysis :

01	device ID
10	function
90 7D	the start bit of the address
00 03	the number of the address
06	six bytes
27 10 1F 40 13 88	the sending data (27 10 light on+time1 LED rated current percentage 1, 1F 40light on+time1 LED rated current percentage 2, 13 88 light on+time1 LED rated current percentage 3)
44 11	CRC

Receive command : 01 10 90 7D 00 03 3D 10

Analysis :

01	device ID
10	function
90 7D	the start bit of the address
00 03	the number of the address
3D 10	CRC

Send command : 01 10 90 72 00 01 02 FF FF 3D 3B

Analysis :

01	device ID
10	function
90 72	the start bit of the address
00 01	the number of the address
02	two bytes
FF FF	the sending data (FF FF battery under voltage control , enable)
3D 3B	CRC

Receive command : 01 10 90 72 00 01 8C D2

Analysis :

01	device ID
10	function code
90 72	the start bit of the address
00 01	the number of the address
8C D2	CRC

Send command : 01 10 90 78 00 01 02 00 23 7D F8

Analysis :

01	device ID
10	function
90 78	the start bit of the address
00 01	the number of the address
02	two bytes

00 23 the sending data (LED rated current)

7D F8 CRC

Receive command : 01 10 90 78 00 01 AC D0

Analysis :

01 device ID

10 function

90 78 the start bit of the address

00 01 the number of the address

AC D0 CRC

Real Time Clock

Station Name	<input type="text" value="Num1"/>	Device ID	<input type="text" value="1"/>
Local Time	<input type="text" value="2016- 2-24"/>	<input type="text" value="18:13:19"/>	<input type="button" value="Manually"/>
Device Time	<input type="text" value="2016-2-24 18:13:14"/> 9013--9015		
<input type="button" value="Read"/>		<input type="button" value="Update"/>	

Num ber	Variable name	Addr ess	Function code	Description	Unit	Time s
D1	Real time	9013	03 (read)	D7-0 Sec, D15-8Min. (Year, Month,		1

	clock		10 (write)	Day, Hour,Min, Sec. should be written simultaneously)		
D2	Real time clock	9014	03 (read) 10 (write)	D7-0 Hour, D15-8 Day		1
D3	Real time clock	9015	03 (read) 10 (write)	D7-0 Month, D15-8 Year		1

For example:

Read the address 0x9013-9015

Send command : 01 03 90 13 00 03 D9 0E

Analysis :

01	device ID
03	function code
90 13	the start bit of the address
00 03	the number of the address
D9 0E	CRC

Receive command : 01 03 06 1A 1B 18 0B 10 02 BC 2E

Analysis :

01	device ID
03	function code
06	six bytes
1A 1B 18 0B 10 02	the receiving data (1A 26(minute), 1B 27(second) , 18 24(day) , 0B 11(hour) , 10 16 (year) , 02 02(month))
B7 24	CRC

Device parameter

Station Name Device ID

Backlight Control **9063** (0 - 999s)

Device Over Temperature **9019** (40 - 100°C)

Device Recovery Temperature **901A** (30 - 80°C)

Battery Upper Temperature Limit **9017** (50 - 80°C)

Battery Lower Temperature Limit **9018** (0 - -40°C)

Num ber	Variable name	Addr ess	Function code	Description	Unit	Time s
E1	Battery upper temperatur e limit	9017	03 (read) 10 (write)		°C	100
E2	Battery lower temperatur e limit	9018	03 (read) 10 (write)		°C	100
E3	Device over temperatur e	9019	03 (read) 10 (write)		°C	100
E4	Device	901A	03 (read)		°C	100

	recovery temperatur e		10 (write)			
E5	Backlight time	9063	03 (read) 10 (write)	Close after LCD backlight light setting the number of seconds	S	1

For example

Send the data of 0x9017-0x901A

Send command : 01 10 90 17 00 04 08 19 64 F0 60 21 34 1D 4C 70 10

Analysis :

01	device ID
10	function
90 17	the start bit of the address
00 04	the number of the address
08	the sending bytes
19 64 F0 60 21 34 1D 4C	the sending data
70 10	CRC

Receive data : 01 10 90 17 00 04 5C CE

Analysis :

01	device ID
10	function code
90 17	the start bit of the address
00 04	the number of the address
5C CE	CRC

Rated parameter

Num ber	Variable name	Addres s	Function code	Description	Unit	Time s
F1	Array rated voltage	3000	04 (read)	PV array rated voltage	V	100
F2	Array rated current	3001	04 (read)	PV array rated current	A	100
F3	Array rated power L	3002	04 (read)	PV array rated power (low 16 bits)	W	100
F4	Array rated power H	3003	04 (read)	PV array rated power (high 16 bits)	W	100
F5	Battery rated voltage	3004	04 (read)	Rated voltage to battery	V	100
F6	Battery rated current	3005	04 (read)	Rated current to battery	A	100
F7	Battery rated power L	3006	04 (read)	Rated power to battery(low 16 bits)	W	100
F8	Battery rated power H	3007	04 (read)	Rated power to battery(high 16 bits)	W	100
F9	Rated load voltage	300D	04 (read)	Rated voltage to load	V	100
F10	Rated load current	300E	04 (read)	Rated current to load	A	100
F11	Rated load power to L	300F	04 (read)	Rated power to load(low 16 bits)	W	100
F12	Rated load power to H	3010	04 (read)	Rated power to load(high 16 bits)	W	100

For example :

Read the array rated voltage

Send command : 01 04 30 00 00 01 3E CA

Analysis :

01 device ID

04 function code

30 00 the start bit of the address

00 01 the number of the address

3E CA CRC

Receive command : 01 04 02 17 70 B7 24

Analysis :

01 device ID

04 function code

02 two bytes

17 70 the receiving data (0x1770 (Dec), 6000 , 6000/100=60V)

B7 24 CRC

The other switching value

Num ber	Variable name	Addr ess	Function code	Description	Unit	Time s
G1	Manual control the load	2	05 (write)	When the load is manual mode , 1-manual on 0 -manual off		1
G2	Enable load test	5	05 (write)	1 Enable		1

	mode			0 Disable(normal)		
G3	Force the load on/off	6	05 (write)	1 Turn on 0 Turn off (used for temporary test of the load)		1
G4	Restore system defaults	13	05 (write)	1 yes 0 no		1

For example :

Send restore system defaults command:

Send command : 01 05 00 13 FF 00 7D FF

Analysis :

01 device ID

05 function code

00 13 the address of the sending data

FF 00 the sending data (enable restore system defaults)

7D FF CRC

Receive command : 01 05 00 13 FF 00 7D FF

Analysis :

01 device ID

05 function code

00 13 the address of the receiving data

FF 00 the receiving data

7D FF CRC

Load test on/off command

1 enter the test mode

Send: 01 05 00 05 ff 00 9c 3b

Receive: 01 05 00 05 ff 00 9c 3b

2 load test: on

Send: 01 05 00 06 FF 00 6c 3b

Receive: 01 05 00 06 FF 00 6c 3b

3 load test: off

Send: 01 05 00 06 00 00 2d cb

Receive: 01 05 00 06 00 00 2d cb

4 exit the test mode

Send: 01 05 00 05 00 00 dd cb

Receive: 01 05 00 05 00 00 dd cb

Special Note:

New version of LS-LPLI, Tracer-LPLI, Tracer-BPL controllers add Li battery function and new version of LS-LPLI, LS-BPL, Tracer-LPLI, Tracer-BPL controllers add load “Light On+Time Model” six times function. Then you need to send the follows command.

Battery parameter(if the battery type is Li, set the following parameter)

Num ber	Variable name	Addr ess	Function code	Description	Unit	Time s
H1	Lower Temperature Charging Limit	9010	03 (read) 10 (write)	When measured temp. < H1, close. The range is from 10°C to -40°C.the basic value is 2°C		100
H2	Lower Temperature Discharging Limit	9011	03 (read) 10 (write)	When measured temp. < H2, close. The range is from 10°C to -40°C.the basic value is 2°C		100
H3	Li battery enabled function	9107	03 (read) 10 (write)	When choose Li battery, the battery type need choose user method. The value of 768, Li battery works. The value of 1024, Li battery does not work. When you use user method		1

				and not Li battery, the value sets 1024.		
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LED load parameter(note: default 3 times)

Num ber	Variable name	Addres s	Function code	Description	Unit	Time s
I1	Six times timing control (time choose)	9069	03 (read) 10 (write)	Record the chose time. 0 , one time, 1, two times, 2, three times, and so on(the max is 5)		1
I2	Light on + time1 timing 4	9086	03 (read) 10 (write)	D15-D8, hour, D7-D0, minute		1
I3	Light on + time1 timing 5	9087	03 (read) 10 (write)	D15-D8, hour, D7-D0, minute		1
I4	Light on + time1 timing 6	9088	03 (read) 10 (write)	D15-D8, hour, D7-D0, minute		1
I5	Light on+ time1 LED rated current percentage4	9089	03 (read) 10 (write)	0 means close		100
I6	Light on+ time1 LED rated current percentage5	908A	03 (read) 10 (write)	0 means close		100

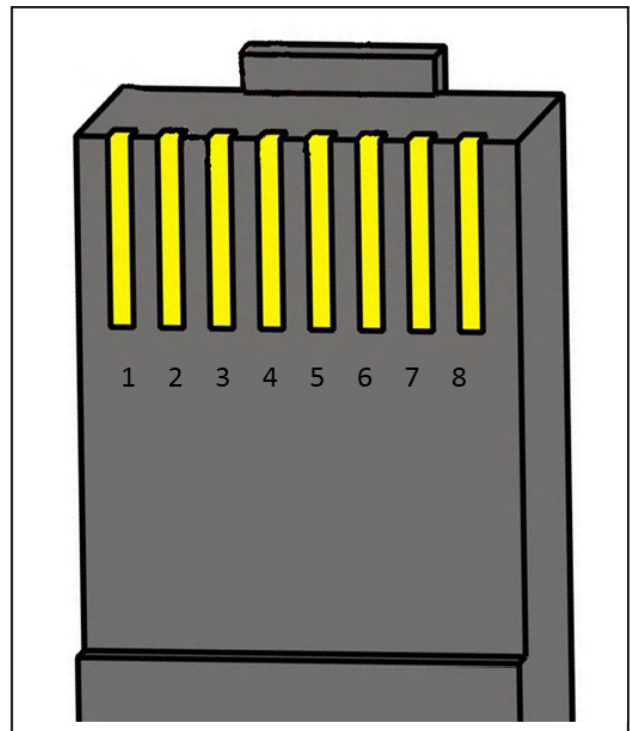
I7	Light on+ time1 LED rated current percentage6	908B	03 (read) 10 (write)	0 means close		100
I8	Light on + time2 timing 4	9041	03 (read) 10 (write)	D15-D8, hour, D7-D0, minute		1
I9	Light on + time2 timing 5	9082	03 (read) 10 (write)	D15-D8, hour, D7-D0, minute		1
I10	Light on + time2 timing 6	9083	03 (read) 10 (write)	D15-D8, hour, D7-D0, minute		1
I11	Light on+ time2 LED rated current percentage4	905D	03 (read) 10 (write)	0 means close		100
I12	Light on+ time2 LED rated current percentage5	9084	03 (read) 10 (write)	0 means close		100
I13	Light on+ time2 LED rated current percentage6	9085	03 (read) 10 (write)	0 means close		100

Pin Definition

1. The RJ45 interface pin define for RS485 port of LS-B、VS-B、Tracer-B 、Tracer-A series controllers is shown below:

Pins define :

Pins	Define
1	Power supply output +5V
2	Power supply output +5V
3	RS-485-B
4	RS-485-B
5	RS-485-A
6	RS-485-A
7	Ground
8	Ground



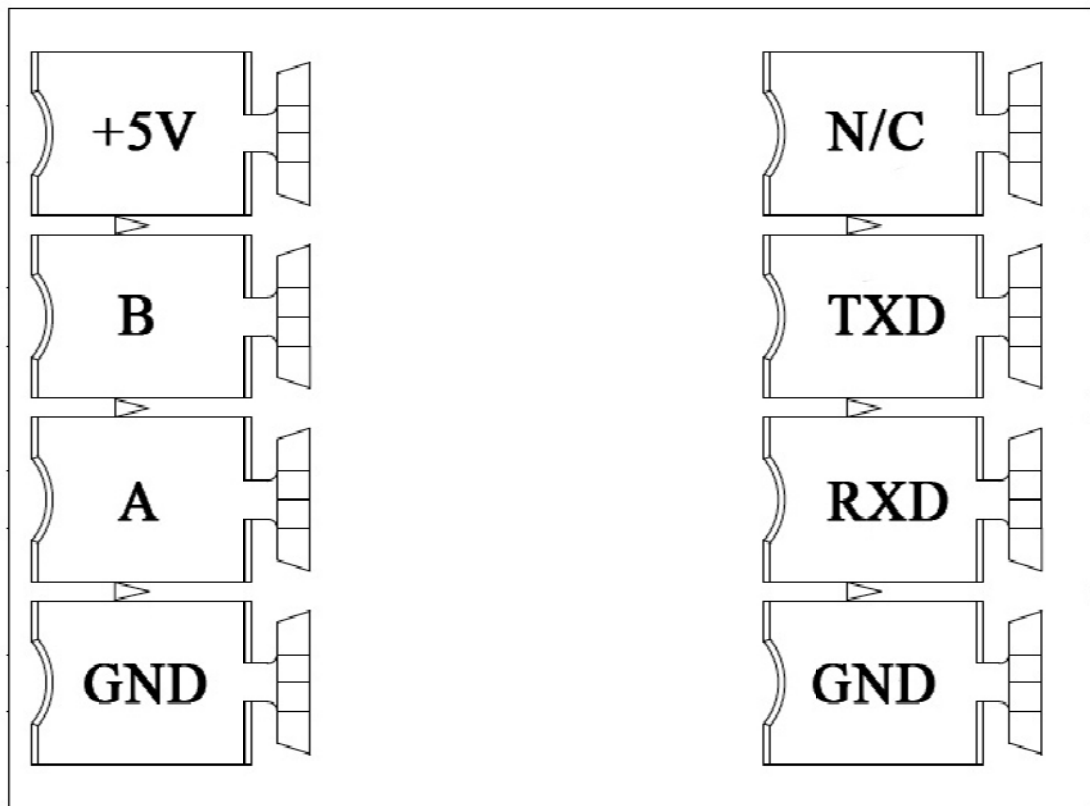
RJ45 plug pins are sorted by number, the sketch map is as shown above:

Note:

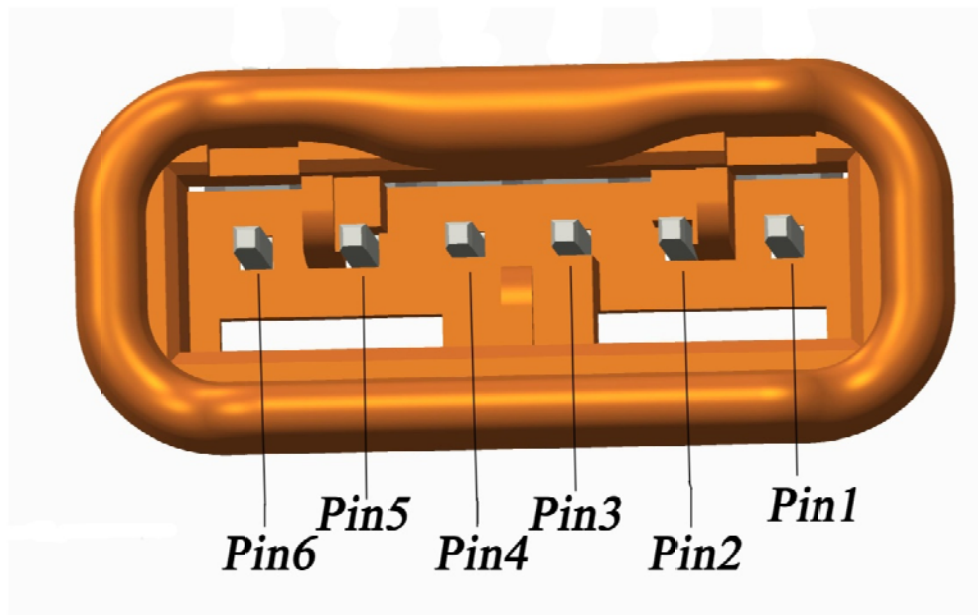
(1)To improve the communication quality, the Gound pins(connected with the negative terminal of the battery) could be used if necessary. However, the user must care the common ground problem of the connected devices.

(2)Do not use the Vcc pins (+5v), or the controller may be damaged permanently.

2. The interface pin definition for RS485 and RS232 port of iTracer、eTracer series controllers is shown below :



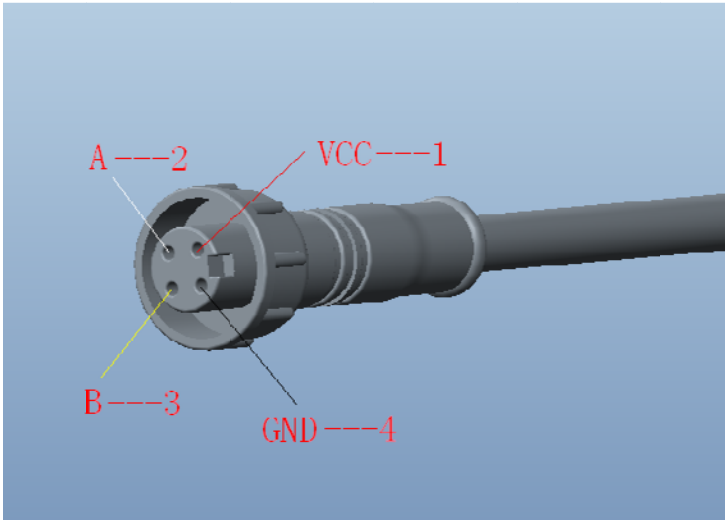
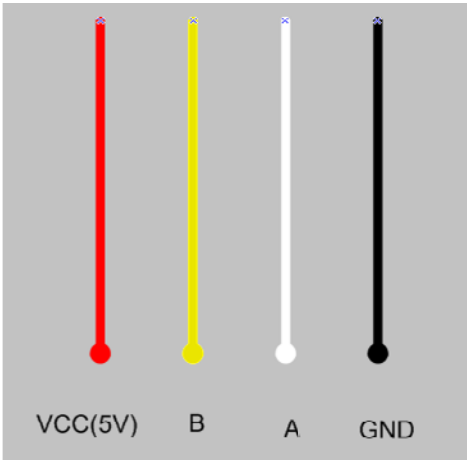
3. The interface pin definition for RS485 of Tracer-BPL、LS-BPL、 DCCP-DPR



series controllers is shown below :

pin	definition
Pin1*	CMOS send pin(TXD)
Pin2	Ground
Pin3*	CMOS receive pin(RXD)
Pin4	Power of 3.3V
Pin5*	Send enable pin(DE)
Pin6	Power of 5V or 7.5V

4.The interface pin definition for RS485 of new version Tracer-BPL、LS-BPL series controllers is shown below :



Definition :

pin	definition
Pin1*	Power of +5v
Pin2	A
Pin3*	B
Pin4	Ground