Modbus Protocol for P10

Protocol in P10.....2
1. Warning item.....2
2. Capability setting（look for Application example 1）.....3
3. Support Capability list.....4
4. Control item（look for Application example 2）.....5
5. The result of control.....5
6. Setting Parameter to default value.....5
7. UPS working status.....6
8. UPS battery information.....7
9. UPS working Mode.....7
10. UPS fault information.....7
11. Setting Parameter item.....7
12. Setting Parameter succeed or fail.....8
13. Loss point.....8
14. Remote shutdown and test.....8
15. CPU information.....9
16. UPS model and rating information.....9
Application example.....13
1. Audible alarm Enable or Disable.....13
2. Setting buzzer beeps Silent.....13
3. Setting control parameter to default value.....13
4. Get input voltage.....13
5. Remote shut down the UPS.....13
6. Shut down UPS and auto restart later.....14
7. Setting Parameter item.....14

Protocol in P09

Modbus Protocol for P10

1. Warning item

Hex	Dec	Size	Content	Bit value	type
0x0000	0	bit15	bit15 = Reservation		
		bit14	bit14 = Reservation		
		bit13	bit13 = Reservation		
		bit12	bit12=Alarm: Battery low	0:FALSE/1:TRUE	Read only
		bit11	bit11=Alarm: Charger fail	0:FALSE/1:TRUE	Read only
		bit10	bit10 = Reservation		
		bit9	bit9=Alarm:L1 IP fuse fail	0:FALSE/1:TRUE	Read only
		bit8	bit8=Alarm:L2 IP fuse fail	0:FALSE/1:TRUE	Read only
			bit7-bit0 = Reservation		
0x0001	1		bit15-bit0= Reservation		
0x0002	2		bit15-bit7 = Reservation		
		bit6	bit6=Alarm：Warning for locking in bypass mode after 3 c	0:FALSE/1:TRUE	Read only
		bit5	bit5=Alarm：Warning for AC input current unb	0:FALSE/1:TRUE	Read only
		bit4	bit4=Alarm：Warning for battery fuse broken	0:FALSE/1:TRUE	Read only
		bit3	bit3=Alarm：Warning for Inverter inter-current unbalance	0:FALSE/1:TRUE	Read only
		bit2	bit2 = Reservation		
		bit1	bit1 = Reservation		
		bit0	bit0=Alarm: Battery open	0:FALSE/1:TRUE	Read only
0x0003	3	bit15	bit15=Alarm: IP N loss	0:FALSE/1:TRUE	Read only
		bit14	bit14=Alarm: IP site fail	0:FALSE/1:TRUE	Read only
		bit13	bit13=Alarm: Battery over charge	0:FALSE/1:TRUE	Read only
		bit12	bit12=Alarm: Overload warning	0:FALSE/1:TRUE	Read only
		bit11	bit11=Alarm: Fan lock warning	0:FALSE/1:TRUE	Read only

		bit10	bit10=Alarm: EPO active	0:FALSE/1:TRUE	Read only
		bit9	bit9 = Warning for battery fuse broken		
		bit8	bit8=Alarm: Over temperature	0:FALSE/1:TRUE	Read only
		bit7	bit7=Alarm: Warning for input phase error for	0:FALSE/1:TRUE	Read only
		bit6	bit6=Alarm: Warning for maintain switch open	0:FALSE/1:TRUE	Read only
			b5-b0 = Reservation		

2. Capability setting（look for Application example 1）

Hex	Dec	Size	Content	Bit value	Register value	type
0x000E	14	bit15	bit15=Enable/disable audible alarm	0:FALSE/1:TRUE	E:8000/D:7FFF	Read/Write
		bit14	bit14=Enable/disable battery mode audible warning	0:FALSE/1:TRUE	E:4000/D:BFFF	Read/Write
		bit13	bit13=Enable/disable battery open status check	0:FALSE/1:TRUE	E:2000/D:DFFF	Read/Write
		bit12	bit12=Enable/disable Site fault detect	0:FALSE/1:TRUE	E:1000/D:EFFF	Read/Write
		bit11	bit11=Set hot standby master/slave, PEM means master, PD	0:FALSE/1:TRUE	E:800/D:F7FF	Read/Write
		bit10	bit10=Enable/disable auto-Restart.	0:FALSE/1:TRUE	E:400/D:FBFF	Read/Write
		bit9	bit9=Enable/disable battery deep discharge protect	0:FALSE/1:TRUE	E:200/D:FDFF	Read/Write
		bit8	bit8=Enable/disable battery low protect	0:FALSE/1:TRUE	E:100/D:FEFF	Read/Write
		bit7	bit7=Enable/disable code start	0:FALSE/1:TRUE	E:80/D:FF7F	Read/Write
		bit6	bit6=Enable/disable bypass forbidding	0:FALSE/1:TRUE	E:40/D:FFBF	Read/Write

		bit5	bit5=Enable/disable short restart 3 times	0:FALSE/1:TRUE	E:20/D:FFDF	Read/Write
		bit4	bit4=Enable/disable inverter short clear function	0:FALSE/1:TRUE	E:10/D:FFEF	Read/Write
		bit3	bit3=Enable/disable bypass when device turn off.	0:FALSE/1:TRUE	E:8/D:FFF7	Read/Write
		bit2	bit2=Enable/disable bypass audible warning	0:FALSE/1:TRUE	E:4/D:FFFB	Read/Write
		bit1	bit1=Enable/disable high efficiency mode	0:FALSE/1:TRUE	E:2/D:FFFD	Read/Write
		bit0	bit0=Enable/disable energy saving	0:FALSE/1:TRUE	E:1/D:FFFE	Read/Write
0x000F	15	bit15	bit15=Enable/disable Output socket1 when the delay release	0:FALSE/1:TRUE	E:8000/D:7FFF	Read/Write
		bit14	bit14=Enable/disable Output socket2 when the delay release	0:FALSE/1:TRUE	E:4000/D:BFFF	Read/Write
		bit13	bit13=Enable/disable deep high efficiency mode	0:FALSE/1:TRUE	E:2000/D:DFFF	Read/Write
		bit12	bit12=Enable/disable converter mode	0:FALSE/1:TRUE	E:1000/D:EFFF	Read/Write
		bit11	bit11=Enable/disable Constant Phase Angle function	0:FALSE/1:TRUE	E:0100/D:FEFF	Read/Write
			b4 - b10 =Reservation			

3. Support Capability list

Hex	Dec	Size	Content	Bit value	type
0x0010	16	bit15	Support: Enable/disable audible alarm	0:FALSE/1:TRUE	Read Only
		bit14	Support: Enable/disable battery mode audible warning	0:FALSE/1:TRUE	Read Only
		bit13	Support: Enable/disable battery open status check	0:FALSE/1:TRUE	Read Only
		bit12	Support: Enable/disable Site fault detect	0:FALSE/1:TRUE	Read Only
		bit11	Support: Set hot standby master/slave, PEM means master, PD	0:FALSE/1:TRUE	Read Only
		bit10	Support: Enable/disable auto-Restart.	0:FALSE/1:TRUE	Read Only

		bit9	Support: Enable/disable battery deep discharge protect	0:FALSE/1:TRUE	Read Only
		bit8	Support: Enable/disable battery low protect	0:FALSE/1:TRUE	Read Only
		bit7	Support: Enable/disable code start	0:FALSE/1:TRUE	Read Only
		bit6	Support: Enable/disable bypass forbidding	0:FALSE/1:TRUE	Read Only
		bit5	Support: Enable/disable short restart 3 times	0:FALSE/1:TRUE	Read Only
		bit4	Support: Enable/disable inverter short clear function	0:FALSE/1:TRUE	Read Only
		bit3	Support: Enable/disable bypass when device turn off.	0:FALSE/1:TRUE	Read Only
		bit2	Support: Enable/disable bypass audible warning	0:FALSE/1:TRUE	Read Only
		bit1	Support: Enable/disable high efficiency mode	0:FALSE/1:TRUE	Read Only
		bit0	Support: Enable/disable energy saving	0:FALSE/1:TRUE	Read Only
0x0011	17	bit15	Support: Enable/disable Output socket1 when the delay release	0:FALSE/1:TRUE	Read Only
		bit14	Support: Enable/disable Output socket2 when the delay release	0:FALSE/1:TRUE	Read Only
		bit13	Support: Enable/disable deep high efficiency mode	0:FALSE/1:TRUE	Read Only
		bit12	Support: Enable/disable converter mode	0:FALSE/1:TRUE	Read Only
		bit11	Support: Enable/disable Constant Phase Angle function	0:FALSE/1:TRUE	Read Only
			b4 - b10 =Reservation		

4. Control item（look for Application example 2）

Hex	Dec	Size	Content	Bit value	Register Value	Type
0x001A	26	bit15	bit15=Silence buzzer beep	0:FALSE/1:TRUE	Y:8000/N:7FFF	Read/We
		bit14	bit14=buzzer beep open	0:FALSE/1:TRUE	Y:4000/N:BFFF	Read/We
		bit13	bit13=Test until battery low	0:FALSE/1:TRUE	Y:2000/N:DFFF	Read/We

		bit12	bit12=Remote turn off UPS	0:FALSE/1:TRUE	Y:1000/N:EFFF	Read/Write
		bit11	bit11=Remote turn on UPS	0:FALSE/1:TRUE	Y:800/N:F7FF	Read/Write
		bit10	bit10=Cancel shutdown	0:FALSE/1:TRUE	Y:400/N:FBFF	Read/Write
		bit9	bit9=Cancel test	0:FALSE/1:TRUE	Y:200/N:FDFF	Read/Write
		bit8	bit8=10 seconds test	0:FALSE/1:TRUE	Y:100/N:FEFF	Read/Write
			bit7-bit0 = Reservation			

5. The result of control

Hex	Dec	Size	Content	Bit value	Type
0x0025	37	bit15	bit15=Flag: Silence buzzer beep	0:FAIL/1:SUCCESS	Reade
		bit14	bit14=Flag: buzzer beep open	0:FAIL/1:SUCCESS	Reade
		bit13	bit13=Flag: Test until battery low	0:FAIL/1:SUCCESS	Reade
		bit12	bit12=Flag: Remote turn off UPS	0:FAIL/1:SUCCESS	Reade
		bit11	bit11=Flag: Remote turn on UPS	0:FAIL/1:SUCCESS	Reade
		bit10	bit10=Flag: Cancel shutdown	0:FAIL/1:SUCCESS	Reade
		bit9	bit9=Flag: Cancel test	0:FAIL/1:SUCCESS	Reade
		bit8	bit8=Flag:10 seconds test	0:FAIL/1:SUCCESS	Reade
			bit7-bit0 = Reservation	0:FAIL/1:SUCCESS	Reade

6. Setting Parameter to default value

Hex	Dec	Size	Content	Bit value	Type
0x0030	48	bit15	bit15=Setting control parameter to default value	0:FAIL/1:SUCCESS	Read/Write
			b14-b0 = Reservation		
0x003B	59	bit15	bit15=Flag: Setting control parameter to default value	0:FAIL/1:SUCCESS	Read/Write
			b14-b0 = Reservation		

Modbus Protocol for P10

7. UPS working status

Hex	Dec	Size	Content	Units	Type
0x00 AA	170	1	Input voltage	0.1V	ReadOnly
0x00 AB	171	1	Input frequency	0.1Hz	ReadOnly
0x00 AC	172	1	Output voltage	0.1V	ReadOnly
0x00 AD	173	1	Output frequency(AC output frequency)	0.1Hz	ReadOnly
0x00 AE	174	1	Output current	0.1A	ReadOnly
0x00 AF	175	1	Output load percent	1%	ReadOnly
0x00 B0	176	1	Positive BUS voltage（P BUS voltage)	0.1V	ReadOnly
0x00 B1	177	1	Negative BUS voltage(S BUS voltage)	0.1V	ReadOnly
0x00 B2	178	1	P Battery voltage	0.1V	ReadOnly
0x00 B3	179	1	N Battery voltage	0.1V	ReadOnly
0x00 B4	180	1	Max Temperature of the detecting pointers	0.1℃	ReadOnly
0x00 B5	181	2	Ups status	Note1	ReadOnly
0x00C 6	198	1	The input voltage of RS	0.1V	ReadOnly
0x00C 7	199	1	The input voltage of RT	0.1V	ReadOnly
0x00C 8	200	1	The input voltage of ST	0.1V	ReadOnly

Modbus Protocol for P10

0x00C9	201	1	The input R voltage	0.1V	ReadOnly
0x00CA	202	1	The input S voltage	0.1V	ReadOnly
0x00CB	203	1	The input T voltage	0.1V	ReadOnly
0x00DC	220	1	AC Output current R	0.1A	ReadOnly
0x00EF	239	1	AC Output current S	0.1A	ReadOnly
0x00F0	240	1	AC Output current T	0.1A	ReadOnly
0x00F7	247	1	AC Output voltage S	0.1V	ReadOnly
0x00F8	248	1	AC Output voltage T	0.1V	ReadOnly
0x00F9	249	1	AC Output Voltage RS	0.1V	ReadOnly
0x00FA	250	1	AC Output voltage RT	0.1V	ReadOnly
0x00FB	251	1	AC Output voltage ST	0.1V	ReadOnly
0x00FC	252	1	AC Output load S	1%	ReadOnly
0x00FD	253	1	AC Output load T	1%	ReadOnly
0x00FE	254	1	AC Output load	1%	ReadOnly
0x011A	282	1	R voltage of bypass	0.1V	ReadOnly
0x011B	283	1	S voltage of bypass	0.1V	ReadOnly
0x011C	284	1	T voltage of bypass	0.1V	ReadOnly
0x0120	288	1	Input phase	degree	ReadOnly
0x121	289	1	Output phase	degree	ReadOnly
0x123	291	1	frequency of bypass	0.1A	ReadOnly

Modbus Protocol for P10

8. UPS battery information

0x00 BC	188	1	Battery voltage	0.1V	ReadOnly
0x00 BD	189	1	Battery piece number		ReadOnly
0x00 BE	190	1	Battery group number		Read/Write
0x00 BF	191	1	Battery capacity	%	ReadOnly
0x00 C0	192	1	Battery remain time	minutes	ReadOnly

9. UPS working Mode

0x00 D0	208	1	UPS Mode inquiry	Note2	ReadOnly

10. UPS fault information

0x02 A3	675	1	Fault kind	Note3	ReadOnly
0x02 A4	676	1	Battery voltage before fault	0.1V	ReadOnly
0x02 A5	677	1	I/P frequency before fault	0.1Hz	ReadOnly
0x02 A6	678	1	I/P voltage before fault	0.1V	ReadOnly
0x02 A7	679	1	Inverter O/P frequency before fault	0.1Hz	ReadOnly
0x02 A8	680	1	Inverter O/P voltage before fault	0.1V	ReadOnly
0x02 A9	681	1	Negative Bus voltage before fault	0.1V	ReadOnly
0x02 AA	682	1	Positive Bus voltage before fault	0.1A	ReadOnly
0x02 AB	683	1	O/P load before fault	0.1V	ReadOnly
0x02 AC	684	1	O/P current before fault	0.1V	ReadOnly
0x02 AD	685	1	Temperature before fault	0.1℃	ReadOnly
0x02 AE	686	1	UPS running status before fault	Note4	ReadOnly

Modbus Protocol for P10

11. Setting Parameter item

Hex	Dec	Size	Content	Units	Type
0x03 4A	842	1	High efficiency mode Voltage high loss point	V	Read/Write
0x03 4B	843	1	High efficiency mode Voltage low loss point	V	Read/Write
0x03 4E	846	1	The bypass Freq high loss point	0.1Hz	Read/Write
0x03 4F	847	1	The bypass Freq low loss point	0.1Hz	Read/Write
0x03 50	848	1	The bypass Voltage high loss point	V	Read/Write
0x03 51	849	1	The bypass Voltage low loss point	V	Read/Write
0x03 5A	858	1	Output Phase Angle		Read/Write

12. Setting Parameter succeed or fail

Hex	Dec	Size	Content	Bit Value	type
0x0385	901	bit15	Flag: High efficiency mode Voltage high loss point	0:FALSE/1:TRUE	Read only
		bit14	Flag: High efficiency mode Voltage low loss point	0:FALSE/1:TRUE	Read only
		bit13	Bit13 = Reservation		
		bit12	Bit12 = Reservation		
		bit11	Flag: The bypass Freq high loss point	0:FALSE/1:TRUE	Read only
		bit10	Flag: The bypass Freq low loss point	0:FALSE/1:TRUE	Read only
		bit9	Flag: The bypass Voltage high loss point	0:FALSE/1:TRUE	Read only

		bit8	Flag: The bypass Voltage low loss point	0:FALSE/1:TRUE	Read only
		bit7	bit7 = Reservation		
		Bit6	bit6 = Reservation		
		Bit5	bit5 = Reservation		
		bit4	bit4 = Reservation		
		bit3	bit3 = Reservation		
		bit2	bit2 = Reservation		
		bit1	Flag: Output Phase Angle	0:FALSE/1:TRUE	Read only
		bit0	bit0 = Reservation		

13. Loss point

Hex	Dec	Size	Content	Units	Type
0x034A	842	1	High efficiency mode Voltage high loss point	V	Read/Write
0x034B	843	1	High efficiency mode Voltage low loss point	V	Read/Write
0x034E	846	1	The bypass Freq high loss point	0.1Hz	Read/Write
0x034F	847	1	The bypass Freq low loss point	0.1Hz	Read/Write
0x0350	848	1	The bypass Voltage high loss point	V	Read/Write
0x0351	849	1	The bypass Voltage low loss point	V	Read/Write

14. Remote shutdown and test

Hex	Dec	Size	Content	Units/Bit value	Type
0x03AB	939	1	Shutdown	minutes(ASCII)	Read/Write
0x03AC	940	1	Test for specified time	minutes(ASCII)	Read/Write
0x03AD	941	1	Shutdown and restore(N)	minutes(ASCII)	Read/Write
0x03AE	942	2	Shutdown and restore(M)	minutes(ASCII)	Read/Write
0x03DA	986	bit15	B15=flag:Shutdown	0:FAIL/1:SUCCESS	Read only
		bit14	b14=flag:Test for specified time	0:FAIL/1:SUCCESS	Read only
		bit13	B13=flag:Shutdown and restore	0:FAIL/1:SUCCESS	Read only
			b12-b0=Reservation		

Modbus Protocol for P10

15. CPU information

Hex	Dec	Size	Content	Units	Type
0x03 E0	992	1	Protocol ID Inquiry	ASCII	Read only
0x03 E1	993	10	Main CPU Firmware version	ASCII	Read only

16. UPS model and rating information

0x03 F2	1010	1	Battery Piece Number		Read only
0x03 F3	1011	1	Battery standard voltage per unit	0.1V	Read only
0x03 F4	1012	1	Input phase		Read only
0x03 F5	1013	1	Output phase		Read only
0x03 F6	1014	1	Nominal I/P Voltage	V	Read only
0x03 F7	1015	1	Nominal O/P Voltage	V	Read only
0x03 F8	1016	1	Output power factor		Read only
0x03 F9	1017	2	Output rated VA	W	Read only
0x03 FB	1019	8	Device model	ASCII	Read only
0x04 8A	1162	1	Battery Voltage	0.1V	Read only
0x04 8B	1163	1	Rating Output Current	0.1A	Read only
0x04 8C	1164	1	Rating Output Frequency	0.1Hz	Read only
0x04 8D	1165	1	Rating Output Voltage	0.1V	Read only

Modbus Protocol for P10

Note

1. Note1

Note 1:	
0x00B5H	00: standy; 01: line-interactive; 10: on-line.
0x00B5L	b7: Utility Fail b6: Battery Low b5: Bypass/Boost Active b4: UPS Failed b3: EPO b2: Test in Progress b1: Shutdown Active b0: bat silence
0x00B6H	a1: Bat test fail a0: Bat test OK

Modbus Protocol for P10

2. Note2

Note 2:		
0x00D0H	P:	Power on mode
	S:	Standby mode
	Y:	Bypass mode
	L:	Line mode
	B:	Battery mode
	T:	Battery test mode
	F:	Fault mode
	E:	HE/ECO mode
	C:	Converter mode
	D:	Shutdown mode

3. Note3

Fault Kind	Fault Number	Fault Name
Bus fault	0x01	Bus start fail
	0x02	Bus volt over
	0x03	Bus volt under
	0x04	Bus volt unbalance
	0x05	Bus short
	0x06	PFC over current
Inverter fault	0x11	Inverter soft fail
	0x12	Inverter volt high
	0x13	Inverter volt low
	0x14	L1 inverter short
	0x15	L2 inverter short
	0x16	L3 inverter short
	0x17	L1L2 inverter short
	0x18	L2L3 inverter short
	0x19	L3L1 inverter short
	0x1A	L1 inverter negative power
	0x1B	L2 inverter negative power
	0x1C	L3 inverter negative power
	0x21	Bat SCR short fault

Electric link fault	0x22	Line SCR short fault
	0x23	Inverter relay open fault
	0x24	Inverter relay short fault
	0x25	Wiring fault
	0x26	Battery reverse fault
	0x27	Battery too high
	0x28	Battery too low
	0x29	Battery Fuse
	0x30	Open-Circuit Fault
Parallel system fault	0x31	CAN communication fault
	0x32	Host line fault
	0x33	Synchronization line fault
	0x34	Synchronization pulse line fault
	0x35	Parallel communication line loss
	0x36	Output circuit fault
Others	0x41	Over temperature
	0x42	CPU communication fault
	0x43	Overload fault
	0x44	Fan fault
	0x45	Charger fault

4. Note4

	Bit	Remarks
0x02AEH	7	1:DCTODC on
	6	1:PFC on
	5	1: INVERTER on
	4	Reserved(always 0)
	3	1:input relay on
	2	1:O/P relay on
	1	Reserved(always 0)
	0	Reserved(always 0)

Modbus Protocol for P10

Application example

1. Audible alarm Enable or Disable

Look for Enable audible alarm, It in table address 0x000E bit15.Then you may write 0x8000 to 0x000E to Enable audible alarm or write 0xEFFF to 0x0E to disable audible alarm.

For example:

[XX 10 00 0E 00 01 02 80 00 CRCL CRCH]Mean: Enable audible alarm.

[XX 10 00 0E 00 01 02 7F FF CRCL CRCH]Mean: Disable audible alarm.

Inquire the result of execute, you may read the follow address 0x10 bit15.

For example:

[XX 03 00 10 00 01 CRCL CRCH]

[XX 03 02 80 00 CRCL CRCH]Mean: Execute success

[XX 03 02 00 00 CRCL CRCH]Mean: Execute fail

2. Setting buzzer beeps Silent.

Look for silence buzzer beep in address 0x001A bit 15 。Then you may write 0x8000 to 0x001A.

For example:

[XX 10 00 1A 00 01 02 80 00 CRCL CRCH]Silence buzzer beep.

Inquire the execution result. You may read 0x0025

[XX 03 00 25 00 01 CRCL CRCH] to inquire the results of command.

Modbus Protocol for P10

3. Setting control parameter to default value

Look for setting control parameter to default value it ,then write 0x8000 to 0x0030.If execute success then set 0x003B bit15 to 1;

For example:

[XX 10 00 30 00 01 02 80 00 CRCL CRCH]Setting control parameter to default value.

[XX 03 00 3B 00 01 CRCL CRCH]to inquire the results of command.

4. Get input voltage

Look for input voltage in address 0x00AA, when read 0x00AA to get input voltage and it units is 0.1V

For example:

PC:[XX 03 00 AA 00 01 CRCL CRH]

DEVICE:[XX 03 02 08 89 CRCL CRCH]

Mean: HEX [0x0889] to DEC[2185] .Input voltage:218.5V.

5. Remote shut down the UPS

Remote shut down the UPS, then write is a number ranging from (.2, .3, ..., 01, 02,..., to 10)to the 0x3AB.If execute success then 0x003DA bit0 was set to 1.

For example:

PC:[XX 10 03 AB 00 01 02 2E 32]Mean: Shut down the UPS in 0.2 minutes

6. Shut down UPS and auto restart later

Cut UPS output off in <n> minutes and waiting for <m> minutes and then turn on UPS output again. Then write n to 0x03AD and write m to 0x003AE.

For example:

PC:[XX 10 03 AD 00 03 06 2E 32 30 30 30 32 CRCL CRCH]Mean: Shut down the UPS in 0.2 minutes and waiting

for 0002 minutes turn on the UPS.

7. Setting Parameter item

Set The bypass Voltage high loss point of UPS ,You want to Set the value 286V . Then write 0x011E to 0x0350 .

For example:

PC:[XX 10 03 50 00 01 02 01 1E CRCL CRCH]Mean: Set The bypass Voltage high loss point of UPS for 286V.