Modbus Protocol for UPSlink

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1. Warning item

Hex	Dec	Size	Content	Bit value	type
0x0000	0	bit15	bit15 = Battery open	0:FALSE/1:TRUE	Read only
		bit14	bit14 – bit10= Reservation		
		bit9	bit9 = Battery over charge	0:FALSE/1:TRUE	Read only
		bit8	bit8 = Battery low	0:FALSE/1:TRUE	Read only
		bit7	bit7 = Overload warning	0:FALSE/1:TRUE	Read only
		bit6	bit6 = Reservation		
		bit5	bit5 = EPO active	0:FALSE/1:TRUE	Read only
		bit4	bit4 = Reservation		
		bit3	bit3 = Over temperature	0:FALSE/1:TRUE	Read only
		bit2	bit2 = Charger fail	0:FALSE/1:TRUE	Read only
		bit1	bit1 = Reservation		
		bit0	bit0 = Reservation		
0x0001	1	bit15	bit15-bit0 = Reservation		
0x0002	2	bit15	bit15-bit0 = Reservation		
0x0003	3		bit15 –bit9= Reservation		
		bit8	bit8= Warning for Battery replace	0:FALSE/1:TRUE	Read only
			bit7-bit6 = Reservation		
		bit2	bit2 = EEPROM operation eeror	0:FALSE/1:TRUE	Read only
			Bit1-bit0 = Reservation		
0x0004	4	bit15	bit15 = Replace battery	0:FALSE/1:TRUE	Read only
		bit14	bit14 = Low battery	0:FALSE/1:TRUE	Read only
		bit13	bit13 = Overload output	0:FALSE/1:TRUE	Read only
		bit12	bit12 = On battery mode	0:FALSE/1:TRUE	Read only
		bit11	bit11 = Online mode	0:FALSE/1:TRUE	Read only
		bit10	bit10 = Reservation		

		bit9	bit9 = Reservation		
		bit8	bit8 = Reservation		

		bit7	bit7 = UPS ready to power load upon user command or return of normal line voltage	0:FALSE/1:TRUE	Read only
		bit6	bit6 = UPS ready to power load upon user command	0:FALSE/1:TRUE	Read only
		bit5	bit5 = Reservation		
		bit4	bit4 = UPS is returning from bypass mode	0:FALSE/1:TRUE	Read only
		bit3	bit3 = UPS in bypass mode as a result of UPS-Link or key command	0:FALSE/1:TRUE	Read only
		bit2	bit2 = Reservation		
		bit1	bit1 = UPS in bypass mode due to internal fault	0:FALSE/1:TRUE	Read only
		bit0	bit0 = Reservation		
0x0005	5	bit15	bit15 = Bad output voltage	0:FALSE/1:TRUE	Read only
		bit14	bit14 = Reservation		
		bit13	bit13 = Reservation		
		bit12	bit12 = UPS fault - DC imbalance; UPS is in bypass	0:FALSE/1:TRUE	Read only
		bit11	bit11 –bit8= Reservation		
		bit7	bit7 = Internal temperature has exceeded nominal limits	0:FALSE/1:TRUE	Read only
		bit6	bit6 = Reservation		
		bit5	bit5 = Battery charger failure	0:FALSE/1:TRUE	Read only
		bit4	bit4 = UPS in shut down mode via “S” command	0:FALSE/1:TRUE	Read only
		bit3	bit3 = UPS in “sleep” mode via “@ddd” command	0:FALSE/1:TRUE	Read only
		bit2	bit2 = Reservation		
		bit1	bit1 = Reservation		
		bit0	bit0 = UPS’s output unpowered due to low battery shut down	0:FALSE/1:TRUE	Read only

Modbus Protocol for UPSlink

2. Capability setting（Looking forApplication example 1）

Hex	Dec	Size	Content	Bit value	Register value	type
0x00	14	bit15	bit15=Enable/disable audible alarm	0:FALSE/1:TRUE	E:8000/D:7FFF	Read/Write
0E			bit14-bit11= Reservation			

		bit10	bit10=Enable/disable auto-Restart. (6-10KVA NOT SUPPORT)	0:FALSE/1:TRUE	E:400/D:FBFF	Read/Write
		bit9	bit9= Reservation			
		bit8	bit8= Reservation			
		bit7	bit7=Enable/disable code start (6-10KVA NOT SUPPORT)	0:FALSE/1:TRUE	E:80/D:FF7F	Read/Write
		bit6	bit6=Enable/disable bypass forbiding	0:FALSE/1:TRUE	E:40/D:FFBF	Read/Write
		bit5	bit5= Reservation			
		bit4	bit4= Reservation			
		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 (6-10KVA NOT SUPPORT)	0:FALSE/1:TRUE	E:1/D:FFFE	Read/Write
0x000F		bit15	bit15-bit13= Reservation			
		bit12	bit12=Enable/disable converter mode	0:FALSE/1:TRUE	E:1000/D:EFFF	Read/Write
			bit0 – bit11 = 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
			Support: bit14-bit11 =Reservation		
		bit10	Support: Enable/disable auto-Restart. (6-10KVA NOT SUPPORT)	0:FALSE/1:TRUE	Read Only
			Support: bit9-bit8 =Reservation		
		bit7	Support: Enable/disable code start (6-10KVA NOT SUPPORT)	0:FALSE/1:TRUE	Read Only
		bit6	Support: Enable/disable bypass forbidding	0:FALSE/1:TRUE	Read Only
			Support: bit5-bit4 =Reservation		
		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	0:FALSE/1:TRUE	Read Only

Modbus Protocol for UPSlink

			mode		
		bit0	Support: Enable/disable energy saving (6-10KVA NOT SUPPORT)	0:FALSE/1:TRUE	Read Only
0x0011		bit15	Support: bit15-bit13 =Reservation		
		bit12	Support: Enable/disable converter mode	0:FALSE/1:TRUE	Read Only

			bit0 - bit11 =Reservation			

4. Control item（look forApplication example 2）

Hex	Dec	Size	Content	Bit value	Register value	Type
0x001A	26	bit15	bit15=Silence buzzer beep	0:FALSE/1:TRUE	Y:8000	Read/Write
		bit14	bit14=buzzer beep open	0:FALSE/1:TRUE	Y:4000	Read/Write
		bit13	bit13=Test until battery low	0:FALSE/1:TRUE	Y:2000	Read/Write
		bit12	bit12=Turn off UPS	0:FALSE/1:TRUE	Y:1000	Read/Write
		bit11	bit11=Turn on UPS	0:FALSE/1:TRUE	Y:800	Read/Write
		bit10	bit10=Cancel shutdown	0:FALSE/1:TRUE	Y:400	Read/Write
		bit9	bit9=Cancel test	0:FALSE/1:TRUE	Y:200	Read/Write
		bit8	bit8=10 seconds test	0:FALSE/1:TRUE	Y:100	Read/Write
			bit7-bit4= Reservation			
		bit3	bit3 = Turn Off after Delay	0:FALSE/1:TRUE	Y:8	Read/Write
		bit2	bit2 = Shutdown UPS on Battery	0:FALSE/1:TRUE	Y:4	Read/Write
			b3-b0 = Reservation			

Modbus Protocol for UPSlink

5. The result of control

Hex	Dec	Size	Content	Bit value	Type
0x0025	37	bit15	bit15=Flag:Silence buzzer beep	0:FAIL/1:SUCCESS	read only
		bit14	bit14=Flag:buzzer beep open	0:FAIL/1:SUCCESS	read only
		bit13	bit13=Flag:Test until battery low	0:FAIL/1:SUCCESS	read only
		bit12	bit12=Flag:Turn Off UPS	0:FAIL/1:SUCCESS	read only
		bit11	bit11=Flag:Turn on UPS	0:FAIL/1:SUCCESS	read only
		bit10	bit10=Flag:Cancel shutdown	0:FAIL/1:SUCCESS	read only
		bit9	bit9=Flag:Cancel test	0:FAIL/1:SUCCESS	read only

bit8	bit8=Flag:10 seconds test	0:FAIL/1:SUCCESS	read only
	bit7-bit5= Reservation		
bit3	bit3 = Flag:Turn Off after Delay	0:FAIL/1:SUCCESS	read only
bit2 Bit1 -bit0	bit2 = Flag:Shutdown UPS on Battery Bit1-bit0= Reservation	0:FAIL/1:SUCCESS	read only

6. Setting Parameter to default value

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

7. Setting Parameter item

Hex	Dec	Size	Content	Units	Type
0x0350	848	1	The bypass Voltage high loss point	V	Read/Write
0x0351	849	1	The bypass Voltage low loss point	V	Read/Write

Modbus Protocol for UPSlink

8. Setting Parameter succeed or fail

Hex	Dec	Size	Content	Bit value	type
0x0385	901	bit15	bit15 =Reservation		
		bit14	bit14 =Reservation		
		bit13	Bit13-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:TR	Read

				UE	only
		bit7	bit7-bit0 = Reservation		

9. UPS working status

Hex	Dec	Size	Content	units	Type
0x00A9	169	1	Battery current	0.1A	ReadOnly
0x00AA	170	1	Line Voltage	0.1V	ReadOnly
0x00AB	171	1	Input frequency	0.1Hz	ReadOnly
0x00AC	172	1	Output voltage	0.1V	ReadOnly
0x00AD	173	1	Output frequency(AC output frequency)	0.01Hz	ReadOnly
0x00AE	174	1	Output current	0.01A	ReadOnly
0x00AF	175	1	Output load percent	0.1%	ReadOnly
0x00B2	178	1	P Battery voltage	0.1V	ReadOnly
0x00B4	180	1	UPS Internal Temperature	0.1℃	ReadOnly
0x00B5	181	2	Ups status	Note1	ReadOnly
0x00BF	191	1	Battery capacity	0.1%	ReadOnly
0x00C0	192	1	Battery remain time	minutes	ReadOnly
	198	1	Line L1L2 voltage	0.1V	ReadOnly
	199	1	Line L2L3 voltage	0.1V	ReadOnly
	200	1	Line L3L1 voltage	0.1V	ReadOnly
	201	1	Line L1 voltage	0.1V	ReadOnly
	202	1	Line L2 voltage	0.1V	ReadOnly
	203	1	Line L3 voltage	0.1V	ReadOnly
0x00D0	208	1	UPS Mode inquiry	Note2	ReadOnly
	216	1	Output L1 voltage	0.1V	ReadOnly
	220	1	L1 load current	0.1A	ReadOnly
	221	1	L1 Load Percent s	0.1%	ReadOnly
	239	1	L2 load current	0.1A	ReadOnly
	240	1	L3 load current	0.1A	ReadOnly
	247	1	Output L2 voltage	0.1V	ReadOnly
	248	1	Output L3 voltage	0.1V	ReadOnly
	249	1	Output L1L2 voltage	0.1V	ReadOnly
	250	1	Output L2L3 voltage	0.1V	ReadOnly
	251	1	Output L3L1 voltage	0.1V	ReadOnly
	252	1	L2 Load Percent	0.1%	ReadOnly
	253	1	L3 Load Percent	0.1%	ReadOnly
	254	1	whole Load Percent	0.1%	ReadOnly
	295	1	Apparent load power	0.01%	ReadOnly

10. UPS battery information

0x036B	875	4	Battery Replacement Date	Note5	Read/Write
0x036F	879	1	Unit Battery Capacity(AH) SP6K, SP10K only support the below setting 7, 9,10,12,17,26,40,65,100 SP1K, SP2K Only Support the below Setting 7	1AH	Read/Write

			SP3K support the below setting 9		

11. Set UPS battery information succeed or fail

Hex	Dec	Size	Content	Bit value	type
0x0386	902	bit15	bit15-bit1 = Reservation		
		bit0	Flag: Set battery replacement data	0:FALSE/1:TRUE	Read only
0x0387	903	bit15	Flag: Set unit battery capacity(AH)	0:FALSE/1:TRUE	Read only
		bit14	bit14 – bit0 = Reservation		

12. UPS fault information

0x02A3	675	1	Fault kind	Note3	ReadOnly

13. Remote shutdown and test

Hex	Dec	Size	Content	Units/bit value	Type
0x03AC	940	1	Test for specified time	minutes(ASCII)	Read/Write
0x03AE	942	2	Shutdown and restore(M)	0.1hours (ASCII)	Read/Write
0x03DA	986	bit15	B15= Reservation		
		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 UPSlink

14. CPU information

Hex	Dec		Content	Units	Type
0x03E1	993	10	Main CPU Firmware version	ASCII	Read only

15. UPS model and rating information

Hex	Dec	Size	Content	Units	Type
0x03EB	1003	7	Manufacturer ID	ASCII	Read only
0x03F2	1010	1	Battery Piece Number		Read only
0x03F4	1012	1	Input phase		Read only
0x03F5	1013	1	Output phase		Read only
0x03F6	1014	1	Nominal I/P Voltage	V	Read only
0x03F7	1015	1	Nominal O/P Voltage	V	Read only
0x03F9	1017	2	Output rated VA	W	Read only
0x03FB	1019	8	Device model	ASCII	Read only
0x048A	1162	1	Battery Voltage	0.1V	Read only

0x048B	1163	1	Rating Output Current	1A	Read only
0x048C	1164	1	Rating Output Frequency	0.1Hz	Read only

16. Read Configurable Parameters

Hex	Dec	Size	Content	Units	Type
0x04F0	1264	1	audible alarm	Note4	Read/Write
0x04F1	1265	1	shutdown delay	seconds	Read/Write
0x04F2	1266	1	turn on delay	seconds	Read/Write

17. Setting Configurable Parameters succeed or fail

Hex	Dec	Size	Content	Bit value	type
0x0516	1302	bit15	Flag: audible alarm	0:FALSE/1:TRUE	Read only
		bit14	Flag: shutdown delay	0:FALSE/1:TRUE	Read only
		bit13	Flag: turn on delay	0:FALSE/1:TRUE	Read only
		bit12	bit12-bit0 = Reservation		

18. Read Configurable EEPROM Parameters Range

(Internal development)

Hex	Dec	Size	Content	Units	Type
0x0538	1336	1	Register address of bypass upper transfer voltage		Read only
0x0539	1337	1	Register address of bypass lower transfer voltage		Read only
0x0540	1338	1	Register address of audible alarm		Read only
0x0541	1339	1	Register address of shutdown delay		Read only
0x0542	1340	1	Register address of turn on delay		Read only
0x0539	1341	25	Register address of parameter reservation		Read only
0x0556	1366	80	parameter buffer		Read only

Modbus Protocol for UPSlink

Note

1. Note1

Hex	Dec	Size	Content	Bit value
0x00B5	181	bit15	bit15-bit8 = Reservation	
		bit7	Flag: Utility Fail	0:FALSE/1:TRUE
		bit6	bit6-bit5 = Reservation	
		bit4	Flag: UPS failed	0:FALSE/1:TRUE
		bit3	bit3-bit0 = Reservation	
0x00B6	182	bit15	Flag: Battery test fail	0:FALSE/1:TRUE
		bit14	Flag: Battery test OK	0:FALSE/1:TRUE
		bit13	bit13-bit0 = Reservation	

2. Note2

Note 2:		
0x00D0H	0x50	Power on mode
	0x53	Standby mode
	0x59	Bypass mode
	0x4C	Line mode
	0x42	Battery mode

Modbus Protocol for UPSlink

	0x54	Battery test mode
	0x46	Fault mode
	0x45	HE/ECO mode
	0x43	Converter mode
	0x44	Shutdown mode

3. Note3

Fault Type	Fault Code	Fault Name
Bus fault	0x01	Bus start fail
	0x02	Bus volt over
	0x03	Bus volt under
	0x04	Bus volt unbalance
	0x05	Bus short
Inverter fault	0x11	Inverter soft fail
	0x12	Inverter volt high
	0x13	Inverter volt low
	0x14	L1 inverter short
	0x1A	L1 inverter negative power
Electric link fault	0x21	Bat SCR fault
	0x24	Inverter relay short fault
	0x27	Battery too high
	0x28	Battery too low
	0x2A	Charger output short
Others	0x41	Over temperature
	0x42	CPU communication fault
	0x43	Overload fault
No Fault	OK/NO	OK: No Fault Occurs NO: Unknown Error

4. Note4

0x04F0H	0x30	~~Audible alarm is sounded immediately upon failure of utility and for~~ low battery condition
	0x54	Alarm is not sounded until utility failure has lasted for more than 30 seconds. Low battery warning operates normally.
	0x4C	Alarm is sounded for low battery conditions only.

	0x4E	Audible alarm is disabled under all conditions.

5. Note5

0x036B	mm/dd/yy	the format " mm/dd/ yy" (month, day, year)

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 1A00 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 UPSlink

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 AA00 01 CRCL CRH]

DEVICE:[XX 03 02 08 89 CRCL CRCH]

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