

Remote Management Card RMCARD205

Modbus TCP Register Map

The Remote Management Card allows a UPS system and environmental sensor to be managed, monitored, and configured.

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Introduction

The CyberPower Remote Management Card RMCARD205 supports Modbus TCP protocol with specific firmware version (TBD). The document describes the related setting and register roadmap.

Design Parameters

Design Parameters	Value	Remark
Role	Server	Response and execute the command
Port	TCP/502	Standard port and fixed
Mode	RTU	MODBUS TCP
Unit ID / Slave Address	Arbitrary	Can be any value. Recommend to be 0xFF or 0x00.

Exception Responses

The table below describes the exception codes along with their possible causes.

Code	Name	Meaning
01H	ILLEGAL FUNCTION	The function code received in the query is not an allowable action for the slave. If a Poll Program Complete command was issued, this code indicates that no program function preceded it.
02H	ILLEGAL DATA ADDRESS	The data address received in the query is not an allowable address for the slave.
03H	ILLEGAL DATA VALUE	A value contained in the query data field is not an allowable value for the slave.
04H	SLAVE DEVICE FAILURE	An unrecoverable error occurred while the slave was attempting to perform the requested action.

Available Modbus Function Codes

The table below describes implemented MODBUS functions:

Code	Original Modbus Function
03H	Read Holding Registers
10H	Write Multiple Registers

Modbus Data Formats

16 bit Integer Values

Values are stored in big-endian order per the MODBUS specification and consist of a single register. All integer values are documented as signed or unsigned. All signed values are represented using two's-complement.

Modbus Register	1															
Byte	0								1							
Bits	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0

String Values

Store variable length string values in a fixed size register range using a NULL (0 value) to terminate or pad the string. For example, up to 16 characters can be stored in 8 contiguous registers as follows

EX : "EXAMPLE STRING!"

Modbus Register	1		2		3		4		5		6		7		8	
Byte	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Character	E	X	A	M	P	L	E	spc	S	T	R	I	N	G	!	NULL

NOT_IMPLEMENTED value: all registers filled with NULL or 0x0000.

Communication Example

The following tables contain the general command descriptions and example with Modbus RTU framing.

Query:

Function code	Address of first word to read		word count	
1 byte	High byte	Low byte	High byte	Low byte

Answer:

Function code	Byte count	Bytes with contents of “n” words
1 byte	1 byte	n * 2 bytes

Systems Modbus Register Map

Holding Registers (Function Code 03h)

Address (Hex)	Address (Dec)	Parameter	Format	Units /Scale	Description
2000	8192	Hardware fault happen		Uint16	1:Yes, 0:No
2001	8193	reserved		Uint16	
2002	8194	reserved		Uint16	
2003	8195	Battery-test Last Result		Uint16	0: Pass, 1: Fail, 2:processing
2004	8196	reserved		Uint16	
2005	8197	Battery capacity is lower than Low Battery Threshold		Uint16	1:Yes, 0:No
2006	8198	Utility power status		Uint16	1:Failure, 0:Normal
2007	8199	Utility voltage out of range		Uint16	1:Yes, 0:No
2008	8200	Utility frequency out of range		Uint16	1:Yes, 0:No
2009	8201	Inverter is off		Uint16	1:Yes, 0:No
200A~200D	8202~8205	reserved		Uint16	
200E	8206	battery not present		Uint16	1:Yes, 0:No

200F~ 2010	8207~ 8208	reserved		Uint16	
2011	8209	Battery is discharging		Uint16	1:Yes, 0:No
2012	8210	Battery is charging		Uint16	1:Yes, 0:No
2013	8211	reserved		Uint16	
2014	8212	Battery is fully charged		Uint16	1:Yes, 0:No
2015~ 201F	8213~ 8223	reserved		Uint16	
2020	8224	Buzzer is muted at present		Uint16	1:Yes, 0:No
2021	8225	Remaining Runtime is lower than Low Battery Runtime Threshold		Uint16	1:Yes, 0:No
2022	8226	No output		Uint16	1:Yes, 0:No
2023~ 2229	8227~ 12287	Reserved			
229C	8860	Over Temperature		Uint16	1:Yes, 0:No
3000	12288	Utility voltage	0.1V	Uint16	
3001	12289	Utility frequency	0.1Hz	Uint16	
3002~ 301F	12290~ 12319	Reserved		Uint16	
3020	12320	Output voltage	0.1V	Uint16	
3021~ 3026	12321~ 12326	Reserved		Uint16	
3027	12327	Output load percent	1%	Uint16	
3028~ 3081	12328~ 12417	Reserved		Uint16	
3082	12418	Battery capacity	1%	Uint16	
3083	12419	Remaining Runtime.LowWord	0.1min.	Uint16	If Remaining Runtime.HighWord=2, Remaining Runtime.LowWord=18 then Remaining Runtime=(HighWord*65536+LowWord)*0.1min=13109min
3084	12420	Remaining Runtime.HighWord	0.1min.	Uint16	
3085~ 3092	12421~ 12434	Reserved		Uint16	

3093	12435	battery threshold	1%	Uint16	
3094	12436	Runtime threshold	1sec	Uint16	
3085~ 30B6	12421~ 12470	Reserved		Uint16	
30B7~ 30C0	12471~ 12480	UPS Model name	ASCII	Uint16	
30C1	12481	Reserved		Uint16	
30C5	12485	Reserved		Uint16	
30C6~ 30CB	12486~ 12491	UPS Version	ASCII	Uint16	
30CC	12492	Reserved		Uint16	
30D0	12496	Reserved		Uint16	
30D1~ 30DB	12497~ 12507	UPS Serial number	ASCII	Uint16	
30DC~ 30E7	12508~ 12519	Company name	ASCII	Uint16	
7000h / 28672d~ Environmental Sensor / Accessory The format is for Environmental Sensor / Accessory					
7000	28672	Temperature Unit		Uint16	1: °F, 0: °C
7001	28673	Condition		Uint16	1: Yes, 0: No Bit0: Temperature high Bit1: Humidity high Bit2: Temperature low Bit3: Humidity low Bit4: Temperature change rate abnormal Bit5: Humidity change rate abnormal Bit6-Bit15: Reserved
7002	28674	Temperature	0.1T/ 0.01T	Int16	Unit T refers to Register 7000h / 28672d
7003	28675	Humidity	1%RH/ 0.01 %RH	Uint16	
7004	28676	Maximum temperature	0.1T/ 0.01T	Int16	Unit T refers to Register 7000h / 28672d
7005	28677	Maximum humidity	1%RH/ 0.01 %RH	Uint16	

7006	28678	Minimum temperature	0.1T/ 0.01T	Int16	Unit T refers to Register 7000h / 28672d
7007	28679	Minimum humidity	1%RH/ 0.01 %RH	UInt16	
7008	28680	Contact status		UInt16	1: Abnormal, 0: Normal Bit0: Contact0 Bit1: Contact1 Bit2: Contact2 Bit3: Contact3
7009~ 7010	28681~ 28688	Reserved			
7011~ 7020	28689~ 28704	Accessory2			Refer to 7001h~7010h/ 28673d~28688d
7021~ 7030	28705~ 28720	Accessory3			
7031~ 7040	28721~ 28736	Accessory4			
7041~ 7050	28737~ 28752	Accessory5			
7051~ 7060	28753~ 28768	Accessory6			
7061~ 7070	28769~ 28784	Accessory7			
7071~ 7080	28785~ 28800	Accessory8			

Write Multiple Registers (Function Code 10h)

Address (Hex)	Address (Dec)	Parameter	Format	Units /Scale	Description
4022	16418	setup Low Battery Threshold	1%	UInt16	Accept value 10 、 20...80 、 90 only. (depending on UPS model)
4023~ 40F3	16419~ 16627	Reserved			
40F4	16628	setup Low Battery Runtime threshold	1sec	UInt16	Amount of time the UPS threshold value of remaining runtime critical low.

					Max time : 30 min
40F5~ 416F	16629~ 16751	Reserved			
4170	16752	Time to execute a battery test.	0.1min	Uint16	Amount of time the UPS Battery Test Duration. Max time : 10 min Note. If duration >= 1 min then only accept multiples of 10.
4171	16753	Reserved		Uint16	
4172	16754	Reserved		Uint16	
4177	16759	Reserved		Uint16	
4178	16760	Time to enter sleep mode.	0.1min	Uint16	Amount of time the UPS waits before it enter sleep mode. Max time : 10 min
4179	16761	Reserved		Uint16	
417A	16762	Reserved		Uint16	
417F	16767	Reserved		Uint16	
4180	16768	Time to enter shutdown mode.	0.1min	Uint16	Amount of time the UPS waits before it shutdown. Max time : 10 min
4181	16769	Reserved		Uint16	
4182	16770	Reserved		Uint16	
4187	16775	Reserved		Uint16	
4188	16776	Time to restore output.	0.1min	Uint16	Amount of time the UPS waits before it restores. Max time : 10 min
4189	16777	Reserved		Uint16	



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K01-E000049-01