山特 3A3 UPS RS232 通信协议

PROTOCOL COMMAND

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一、 概述

3A3 UPS 可以响应的命令有：

WH\<cr\>

WH, XX\<cr\>

QA\<cr\>

Q2, XX, YY\<cr\>

S\<n\>\<cr\>

S\<n\>R\<m\>\<cr\>

C\<cr\>

其中 XX 表示机柜地址，范围 01~96；YY 表示模组在机柜中的物理地址，范围 01~96。带参数 YY 的命令对应于系统中单台模组，其他命令针对整个系统。

二、 3A3 UPS 的特殊处理

上位机首先通过查询 WH\<cr\>命令来获得整个系统中有几个并联的机柜，系统的输入输出类型，以及旁路维护开关的状态，旁路输出状态，询问 WH, XX\<cr\> 来查询各机柜中模组的基本信息。得到的回应信息包括被查询机柜中模组的物理位置和模组类型，将做为下一步轮询的基础。

在得到机柜中模组的类型和位置后，上位机发出 Q2, XX, YY\<cr\>命令来查询各模组的详细信息，其中 XX 指定机柜物理地址，YY 指定机柜内的模组物理地址。

3A3 UPS 由多个 UPS 模组组成，但对外仍以整台 UPS 的概念出现，因此 UPS 整机也有其单独的状态、数据等各种参数。对大多数用户而言，只需要了解整机的状态即可，维护人员则可能需要知道各模组的情况。使用查询命令 QA\<cr\>，LCD 实际回应整机的一些参数，上位机可以直接取用来显示 UPS 整机状态和整机参数。

3A3 UPS 的旁路存在两种情形：旁路有输出，旁路无输出，由用户操作决定。因此，在显示旁路状态时应体现出该区别（如用旁路供电/旁路无输出区分）。为此在 WH\<cr\>命令的回应中增加一位，该位为 ASCII 码 '1' 时表示旁路无输出，为'0'表示有输出。参见 WH 命令详细描述。

若系统只有一个机柜，机柜地址 XX 直接设为 01 即可。即指令 WH, XX\<cr\>和 Q2, XX, YY\<cr\>中机柜地址为 WH, 01\<cr\>和 Q2, 01, YY\<cr\>。

三、 命令详细描述

Hardware:

BAUD RATE………………………2400 bps
DATA LENGTH……………………8 bits
STOP BIT…………………………..1 bits
PARITY…………………………..NONE

Commands:

3.1 WH<cr> Command

Computer：

WH<cr>

UPS：

(VV.VV PP.PP
T29T28T27T26T25T24T23T22T21T20T19T18T17T16T15T14T13T12T11T10T9T8T7T6T5
T4T3T2T1T0 MMM FF.FF MMM NNN FF.FF FF.FF Q7Q6Q5Q4Q3Q2Q1Q0
C7C6C5C4C3C2C1C0<cr>

UPS Firmware Version: VV.VV

V is an integer number ranging from 0 to 9.

Protocol Number: PP.PP

P is an integer number ranging from 0 to 9.

UPS Name: TTTTTTTTTTTTTTTTTTTTTTTTTTTTTT (30 Char.)

Eg:

T29	T28	T27	T26	T25	T24	T23	T22	T21	T20	T19	T18	T17	T16	T15
A	r	r	a	y	-	3	A	3						
T14	T13	T12	T11	T10	T9	T8	T7	T6	T5	T4	T3	T2	T1	T0
1	5		1	0		2	0		2	5		1	2	0

T29-T16: UPS name

T14-T13: Capacity of type 1 , 5

T11-T10: Capacity of type 1, 0

T8-T7: Capacity of type 2, 0

T5-T4: Capacity of type 2, 5

T2-T0: Total capacity of the parallel system(KVA).

Nominal Mains Voltage: MMM

M is an integer number ranging from 0 to 9

Output Frequency: FF.FF

F is an integer number ranging from 0 to 9.

Minimum Mains Voltage: MMM

M is an integer number ranging from 0 to 9. The unit is Volt

Maximum Mains Voltage: NNN

N is an integer number ranging from 0 to 9. The unit is Volt

Minimum Mains Frequency: FF.FF

F is an integer number ranging from 0 to 9. The unit is Hertz

Maximum Mains Frequency: FF.FF

F is an integer number ranging from 0 to 9. The unit is Hertz

UPS Info: Q7Q6Q5Q4Q3Q2Q1Q0:

Where <Qn> is a binary number   "0" or "1".

Q7Q6Q5Q4Q3Q2Q1Q0:

Bit	Description
7	reserved
6	reserved
5	reserved
4	reserved
3	reserved
2	1 : Maintain cover open
1	1 : Bypass no output
0	1 : single/three phase output

Canbinet Info: **C7C6C5C4C3C2C1C0:**

Where <Cn> is a binary number "0" or "1".

< C7C6C5C4C3C2C1C0>:

Bit	Description
7	1 : Canbinet 8 (physical position) exist
6	1 : Canbinet 7 (physical position) exist
5	1 : Canbinet 6 (physical position) exist
4	1 : Canbinet 5 (physical position) exist
3	1 : Canbinet 4 (physical position) exist
2	1 : Canbinet 3 (physical position) exist
1	1 : Canbinet 2 (physical position) exist
0	1 : Canbinet 1 (physical position) exist

Stop Byte: <cr>

Total length (with stop byte): 92 bytes

3.2 WH,XX<cr> Command

Computer：

WH,XX<cr>

UPS：

(XX I11I10I9I8I7I6I5I4I3I2I1I0 TT.T TT.T TT.T TT.T TT.T TT.T TT.T TT.T TT.T TT.T TT.T TT.T HH <cr>

Canbinet Address : XX

XX is ascii combination represent an integer number ranging from 01 to 96. If there is only one Canbinet, XX should be set to be "01".

Module Tip: I11I10I9I8I7I6I5I4I3I2I1I0:

Where <In> is a number from "0" to "9"

"0" means there is no module exist in that physical position

Other character from "1" to "8" means there is module exist in that physical position

Bit	Description
10	>0 : Module 11 (physical position) exist
9	>0 : Module 10 (physical position) exist
8	>0 : Module 9 (physical position) exist
7	>0 : Module 8 (physical position) exist
6	>0 : Module 7 (physical position) exist
5	>0 : Module 6 (physical position) exist
4	>0 : Module 5 (physical position) exist
3	>0 : Module 4 (physical position) exist
2	>0 : Module 3 (physical position) exist
1	>0 : Module 2 (physical position) exist
0	>0 : Module 1 (physical position) exist

Module Inverter Temperature：TT.T

T is an integer number ranging from 0 to 9. The unit is degree of centigrade.

O/P load sharing Module Number： HH

H is an integer number ranging from 0 to 9.

Stop Byte: <cr>

Total length(with stop bytes): 81bytes

3.3 QA<cr> Command

Computer：

QA<cr>

UPS：

(MMM.M MMM.M MMM.M NNN.N PPP.P PPP.P PPP.P QQQ QQQ QQQ RR.R YYY.Y YYY.Y WWW.W WWW.W WWW.W VVV.V VVV.V VVV.V b7b6b5b4b3b2b1b0 ttt.tt CCC UUU BB LLL AA 0 H ff ff ff ff wwwwwwww <cr>

Input Voltage: MMM.M

M is an integer number 0 to 9. The Unit is Volt.

Three Phases will represent Phase R-S-T in sequence

I/P fault voltage: NNN.N

N is an integer number 0 to 9. The Unit is Volt.

Output Voltage: PPP.P

P is an integer number 0 to 9. The Unit is Volt.

Three Phases will represent Phase R-S-T in sequence

Output Current: QQQ

QQQ is an integer number 0 to 9, represent absolute value of output current,The Unit is A.

Three Phases will represent Phase R-S-T in sequence

I/P frequency: RR.R

R is an integer number ranging from 0 to 9. The unit is Hz.

Battery   voltage: YYY.Y

    S is an integer number ranging from 0 to 9.

    Battery voltage will represent position postive and negative in sequence. The unit is Volt.

Output power: WWW.W

    W is an integer number 0 to 9. The Unit is kW. R phase

    Three Phases will represent Phase R-S-T in sequence

Output complex power: VVV.V

    V is an integer number 0 to 9. The Unit is kVA. R phase

    Three Phases will represent Phase R-S-T in sequence

UPS Status: <b7b6b5b4b3b2b1b0>.

    Where <bn> is a binary number "0" or "1".

    UPS status :

byte	Description
7	1 : Utility Fail (Immediate)
6	1 : Battery Low
5	1 : Bypass/Boost Active
4	1 : UPS Failed
3	1 : UPS Type is Standby (0 is On_line)
2	1 : Test in Progress
1	1 : Shutdown Active
0	Reserved (always 0)

Estimated Runtime: ttt.tt

Charge in Status in %: CCC

Temperature of the canbinet : UUU

    UUU range from 000 to 999. The unit is centigrade.

Status of Battery test : BB

    00: idle

    01: processing

    02: result : no failure

    03: result : failure / warning

O/P load: LLL

    LLL is maximum of the total three phase W% or VA%. VA% is a percent of maximum VA. W% is a percent of maximum   real power.

O/P load sharing Module Number: AA

    A is an integer number 0 to 9.

Lcd Display Output Voltage Line or Phase: 0

    Always phase voltage ('0') in 3A3 UPS.

Canbinet Display Hints: H

    0: do not display canbinet level

    1: display canbinet level

Fault code：FF

Warnings：wwwwwwww

Total length (with stop byte) :   168bytes

3.4 Q2,XX,YY<cr>   Command

Computer：

Q2,XX,YY<cr>

UPS：

(XX YY MMM.M MMM.M MMM.M NNN.N PPP.P PPP.P PPP.P QQQ QQQ QQQ RR.R SSS.S SSS.S b7b6b5b4b3b2b1b0 ttt.tt CCC BB ff ff ff ff wwwwwwww <cr>

Canbinet Address : XX

XX is ascii combination represent an integer number ranging from 01 to 96. If there is only one Canbinet, XX should be set to be "01".

Module Address (UPS ID): YY

YY is ascii combination represent an integer number ranging from 01 to 96.

Input Voltage: MMM.M

M is an integer number 0 to 9. The Unit is Volt.

Three Phases will represent Phase R-S-T in sequence

I/P fault voltage: NNN.N

N is an integer number 0 to 9. The Unit is Volt.

Output Voltage: PPP.P

P is an integer number 0 to 9. The Unit is Volt.

Three Phases will represent Phase R-S-T in sequence

Output Current: QQQ

QQQ is an integer number 0 to 9, represent absolute value of output current..The Unit is A.

Three Phases will represent Phase R-S-T in sequence

I/P frequency: RR.R

R is an integer number ranging from 0 to 9. The unit is Hz.

Battery   voltage: SSS.S

S is an integer number ranging from 0 to 9.

Battery voltage will represent position postive and negative in sequence. The unit is Volt.

UPS Status: <b7b6b5b4b3b2b1b0>

Where <bn> is a binary number "0" or "1".

UPS status :

byte	Description
7	1 : Utility Fail (Immediate)
6	1 : Battery Low
5	1 : Bypass/Boost Active
4	1 : UPS Failed
3	1 : UPS Type is Standby (0 is On_line)
2	1 : Test in Progress
1	1 : Shutdown Active
0	Reserved (always 0)

Estimated Runtime: ttt.tt

Charge in Status in ％:CCC

Status of Battery test :BB

00: idle

01: processing

02: result : no failure

03: result : failure / warning

Fault code: FF

Warnings: wwwwwwww

Stop Byte: <cr>

Total length (with stop byte) : 123 bytes

3.5   S<n><cr>   Command

Computer：

S<n><cr>

UPS：

Shut UPS output off in <n> minutes.

The UPS output will be off in <n> minutes, even if the utility is present.

But if the battery under occur before <n> minutes, the output is turned off immediately.

After UPS shut down, the controller of UPS monitors the utility. If the utility is there, the UPS will wait for 10 seconds and connect the utility to output.

<n> is a number ranging from.1,.2, .3, ..., .9,01, 02,..., to 10.

For example: S.3<cr> --- shut output off in (.3) minutes

3.6   S<n>R<m><cr>   Command

Computer：

S<n>R<m><cr>

UPS：

Shut UPS output off in <n> minutes and waiting for <m> minutes then turn on UPS output again.

The shut down sequence is the same as the previous command. When the <m> minutes expired, the utility do not restore, the UPS will wait until utility restore.

If UPS is in shut down waiting status, the "C" command can let the shut down command cancelled.

If UPS is in restore waiting status, the "C" command can let the UPS output turned on, but UPS must be hold off at least 10 seconds. (if utility is present)

<n> is a number ranging from .1,.2, .3, ..., .9,01, 02, ..., to 99.

<m> is a number ranging from 0001 to 9999.

3.7   C<cr>   Command

Computer：

C<cr>

UPS：

Cancel the S<n><cr> and S<n>R<m><cr> command.

If UPS is in shut down waiting state, the shut down command is cancelled.

If UPS is in restore waiting state, the UPS output is turned on, but UPS must be hold off at least 10 seconds. (if utility is present)