

Case Name:		Date:		Num:	
Case Num:		Version:		PAGE	1/68

# Voltronic Power

## UPS Communication Protocol

Author: Jinxiao                      Date: 2008-10-09  
 Confirm: \_\_\_\_\_                      Date: \_\_\_\_\_  
 Approve: \_\_\_\_\_                      Date: \_\_\_\_\_

Case Name:		Date:		Num:	
Case Num:		Version:		PAGE	2/68

Modify Note

Num	Version	Modify content	Author	Date	Confirm	Date
1	00	first draft	jinxiao	2008-10-09		
2	01	modify some commands	jinxiao	2008-11-12		
3	02	1,add off-line step commands for compatibility to old ups 2,modify response of control and setting commands 3,delete and add some flag 4,add Chapter of command supported by UPS	scott	2008-11-13		
4	03	There are two "PDF" command, change the "PDF" of parameter to default value to "PF"	jinxiao	2009-1-14		
5	04	Modified the "SKON", "SKOFF".	jinxiao	2009-1-24		
6	05	Modified the "PE/PD" command, add the "PSK" command.	jinxiao	2009-1-24		
7	06	add QWS command to inquiry the warning status; Modify the fault code	jinxiao	2009-1-24		
8	07	add QSK command to inquiry the output socket release delay time in battery mode.	scott	2009-02-01		
9	08	Modify the "QSK", and add the "QSKT" command	kevin	2009-2-23		
10	09	add inverter short clear command PEI & PDI	jinxiao	2009-02-24		
11	10	Add battest fail flag and	jinxiao	2009-3-5		

Case Name:						Date:						Num:											
Case Num:						Version:						PAGE						3/68					
		battest passed in QGS command																					
12	11	协议未作修改, 但进版内含的文件“SW&FW Supporting Commands090323.doc”										kevin	2009-3-23										
13	12	add site fault detect Enable/Disable command PEL/PDL										Scott	2009-3-24										
14	13	修改 QID, QBV, QNBV, ID, BATGN 命令格式										Scott	2009-3-31										
15	14	修正 PSK 协议描述错误										kevin	2009-9-23										
16	15	add battery fuse open fault and four warning codes(见 QFS、QWS)										jinxiao	2010-02-09										
17	16	更新插入文件“ViewPower Commands List for UPS-100108.xls”										kevin	2010-02-21										
18	17	仅更新 2010-02-09 新增的“1 个 fault 和 4 个 warning 事件”名称的英文翻译(见 QFS、QWS)										kevin	2010-03-12										
19	18	add 3/3 protocol; enhance command Q3PC, Q3YV and Q3LD; use QNBV and QGS negative battery voltage for 3/3;										jah	2010-03-22										
20	19	在 QWS 中增加 P1 切断预警位“a54”										Tom	2010-03-22										
21	20	更新插入文件“ViewPower Commands List for UPS-100329.xls”										kevin	2010-03-29										
22	21	在 QWS 中增加 Battery Replace 告警位 a55 增加 Deep ECO Detect /Enable /Disable command PEN/PDN										Scott	2010-05-13										

Case Name:		Date:		Num:	
Case Num:		Version:		PAGE	4/68

		增加“REEP”内部命令，用于还原除 ID 号之外的 EEPROM 内容到默认值 增加“BZDT”内部命令，用于关闭或打开 Buzzer				
23	22	add command PEM and PDM to set hot standby master or slave				
24	23	add command Q3YC, QWF, QVER for taurus UPS; modify command Q3LD;				
25	24	modify some setting command for Galleon 10-20k special use	jah	2010-8-12		
26	25	add command PEU/PDU to set free run function enable or disable	jah	2010-8-23		
27	26	add PEQ/PDQ for Constant Phase Angle function of LV UPS 6-10K	jah	2010-12-09		
28	27	add VOP+/-nn to adjust output voltage	jah	2010-12-09		
29	28	在 QWS 中增加输入“相角不正常告警”，告警位为 a56	jah	2010-12-09		
30	29	定义 warning 代码，用于 LCD 界面上的显示	jah	2010-12-27		
31	30	add command QPD and command PPD<n> for the UPS with two input and two output.	jah	2011-01-26		
32	31	在 QWS 中增加维护旁路开路报警	jah	2011-03-05		
33	32	增加 LV 所用命令列表	jah	2011-03-10		
34	33	增加命令 PEX/PDX 用于设置两相机 0 度时并板输出功能	jah	2011-04-26		

Case Name:		Date:		Num:	
Case Num:		Version:		PAGE	5/68

		的使能与否；增加命令 PEY/PDY 用于设置三单机种输入频率自动侦测功能；				
35	34	1, 增加内部命令 QBCO, BATCO 用于查询及设置电池最低 Cut-off 电压 2, 增加内部命令 QIPT, IPT 命令用于查询及设置可接受输入市电类型 3, 增加 Eeprom 操作异常告警, 告警位为 a61	Scott	2011-8-22		
36	35	1. 增加告警位 a62, 修改 a35, a36, a38, a39 告警位定义 2. 6. 34~6. 52 命令均有修改 3. 增加 4. 52 QNL, 4. 53 QVFW3 命令及 6. 52 NL 命令	Jency	2012-1-9		
37	36	1, 增加电池容量和容量系数设置命令 BATCAP 和 BATCOEF 用于设置电池 AH 数, 参考 6. 53~54; 3, 增加电池容量查询命令 QBAT, 用于查询电池参数, 参考 4. 54; 4, 修改 CHGC 和 QCHGC 对应数据的有效范围, 以支持 combo 机器 6. 0A 最大充电电流设置功能; 5, 增加并机通讯告警清除命令 CLRPP, 参考 5. 19; 6, 增加电池自检测到某电压功能, 参考 4. 55 和 5. 20; 7, 增加告警位 a63, 电池过放电告警, 参考 4. 7;	windy	2012-2-2		
38	37	1. PE/PD, QFLAG 命令中增加 FLAG 'w'	谭永华	2012-02-15		

Case Name:						Date:						Num:											
Case Num:						Version:						PAGE						6/68					
39	38	<ul style="list-style-type: none"> <li>1. QFS 增加 46, 47fault;</li> <li>2. 增加 DC 分量校准命令 6. 55, 6. 66, 6. 67</li> <li>3. 增加查询旁路频率的命令 QYF</li> <li>4. Q3YV 命令增加旁路线电压</li> </ul>	Jency	2012-2-27																			
40	39	<ul style="list-style-type: none"> <li>1, QWS 修改位 a37 定义, 定义为单体电池过充, 用于 combo6-10K;</li> <li>2, 增加设置电池过充开始电压 VSOC 和查询命令 QVSOC;</li> </ul>	Windy	2012-3-6																			
41	40	<ul style="list-style-type: none"> <li>1, 增加电池总 AH 查询和设置命令 QBTAH, BATAH</li> <li>2, 增加周期自检 Enable / Disable 命令 PEZ/PDZ</li> <li>3, 增加周期自检自检周期查询和设置命令 QPST, PST</li> <li>4, 增加设备制造商信息查询命令 QMF</li> <li>5, 增加设备当前时间查询和设置命令 QTIME, TSET</li> <li>6, 增加计划时区查询和设置命令 QSTZ, STSET</li> <li>7, 增加电池放电 WH 查询和复位命令 QDWH, DWHRST</li> </ul>	Scott	2012-5-2																			
42	41	增加修改制造商名MM命令, 修改机器名 MU 命令, 修改最大放电时间 MD 命令, P1 功能使能 PP1E 及 P1 功能禁止 PP1D 命令	Michael	2012-8-22																			
43	42	QFS 增加 48 fault code 的定义	Jency	2012-8-22																			
44	43	更新 QVFW, QVFW2, QVFW3 内容说明	Jency	2012-8-28																			

Case Name:		Date:		Num:	
Case Num:		Version:		PAGE	7/68

45	44	增加 I 及 0 命令, 用于设置输出 输入变压比	Jency	2012-11-26		
----	----	------------------------------	-------	------------	--	--

Case Name:		Date:		Num:	
Case Num:		Version:		PAGE	8/68

## CATALOGUE

<b>1</b>	DOCUMENT DESCRIPTION.....	<b>15</b>
1.1	GOALS.....	15
1.2	ORGANIZATION .....	15
1.3	REFERENCE DOCUMENT .....	15
1.4	GLOSSARY – ABBREVIATIONS – NOTATIONS .....	15
<b>2</b>	<b>HARDWARE DESCRIPTION.....</b>	<b>15</b>
<b>3</b>	<b>COMMAND SUPPORTED BY SOFTWARE.....</b>	<b>16</b>
<b>4</b>	<b>INQUIRY COMMAND .....</b>	<b>16</b>
4.1	QPI<CR>: PROTOCOL ID INQUIRY .....	16
4.2	M<CR>: UPS PASSWORD---SPECIAL FOR OFF-LINE .....	16
4.3	QS<CR>: UPS STATUS PARAMETERS INQUIRY---SPECIAL FOR OFF-LINE .....	16
4.4	QMD<CR>: MODEL INQUIRY.....	19
4.5	QGS<CR>: THE GENERAL STATUS PARAMETERS INQUIRY.....	20
4.6	QFS<CR>: FAULT STATUS INQUIRY .....	21
4.7	QWS<CR>: WARNING STATUS INQUIRY .....	25
4.8	QWF<CR>: WARNING STATUS AND FAULT STATUS INQUIRY--FOR TAURUS .....	27
4.9	QMOD<CR>: UPS MODE INQUIRY.....	29
4.10	QRI<CR>: UPS RATING INFORMATION INQUIRY.....	30
4.11	F<CR>: UPS RATING INFORMATION INQUIRY---SPECIAL FOR OFF-LINE .....	30
4.12	Q3PV<CR>: THE INPUT THREE PHASE VOLTAGE INQUIRY.....	30
4.13	Q3PC<CR>: THE INPUT THREE PHASE CURRENT INQUIRY.....	31
4.14	Q3OV<CR>: THE OUTPUT THREE PHASE VOLTAGE INQUIRY.....	32
4.15	Q3OC<CR>: THE OUTPUT THREE PHASE CURRENT INQUIRY.....	32
4.16	Q3YV<CR>: THE BYPASS THREE PHASE VOLTAGE INQUIRY.....	32
4.17	QYF <CR>: THE BYPASS FREQUENCY INQUIRY .....	33
4.18	Q3YC<CR>: THE BYPASS THREE PHASE CURRENT INQUIRY .....	33



Case Name:		Date:		Num:	
Case Num:		Version:		PAGE	9/68

4.19	Q3LD<CR>: THE THREE PHASE LOAD INQUIRY .....	34
4.20	QRPV<CR>: THE INPUT R PHASE VOLTAGE INQUIRY .....	34
4.21	QBYV<CR>: THE BYPASS VOLTAGE RANGE INQUIRY .....	35
4.22	QBYF<CR>: THE BYPASS FREQUENCY RANGE INQUIRY .....	35
4.23	QPAR<CR>: UPS PARALLEL NUMBER INQUIRY .....	35
4.24	QFLAG<CR>: SETTING FLAG STATUS INQUIRY .....	35
4.25	QVFW<CR> : MAIN CPU FIRMWARE VERSION INQUIRY .....	36
4.26	QVER<CR> : MAIN CPU FIRMWARE VERSION INQUIRY--FOR TAURUS .....	38、
以上-----20140805		
4.27	QID<CR>: THE UPS ID INQUIRY .....	38
4.28	QBV<CR>: THE P BATTERY INFORMATION INQUIRY .....	39
4.29	QNBV<CR>: THE N BATTERY INFORMATION INQUIRY .....	39
4.30	QLDL<CR>: LOAD LEVEL INQUIRY .....	39
4.31	QHE<CR>: HIGH EFFICIENCY MODE VOLTAGE RANGE INQUIRY .....	39
4.32	QFRE<CR>: FREE RUN MODE FREQUENCY RANGE INQUIRY .....	40
4.33	QSK<N><CR>: OUTPUT SOCKET STATUS INQUIRY .....	40
4.34	QSKT<N><CR>: OUTPUT SOCKET RELEASE DELAY TIME INQUIRY IN BATTERY MODE .....	40
4.35	QBDR<CR>: THE BAUD RATE INQUIRY .....	40
4.36	QVFW2<CR> :THE SECOND CPU FIRMWARE VERSION INQUIRY .....	37
4.37	QTPR<CR>: THE TEMPERATURE INQUIRY .....	40
4.38	Q5<CR>: FIRMWARE CURRENT VERSION RELEASE TIME INQUIRY .....	41
4.39	QCHGC<CR>: SETTING CHARGING CURRENT INQUIRY .....	41
4.40	QBUS<CR>: BUS VOLTAGE SETTING VALUE INQUIRY .....	41
4.41	QBUSP<CR>: POSITIVE BUS VOLTAGE FINE-TURNING VALUE INQUIRY .....	42
4.42	QBUSN<CR> : NEGATIVE BUS VOLTAGE FINE-TURNING VALUE INQUIRY .....	42
4.43	QVB<CR>: BATTERY SAMPLING VOLTAGE FINE-TURNING VALUE INQUIRY .....	42
4.44	QV<CR>: OUTPUT VOLTAGE SETTING VALUE INQUIRY .....	42
4.45	QVC<CR>: OUTPUT VOLTAGE FINE-TURNING VALUE INQUIRY .....	42

Case Name:		Date:		Num:	
Case Num:		Version:		PAGE	10/68

4.46	QVLINE<CR>: THE LINE SAMPLING VOLTAGE FINE-TURNING VALUE INQUIRY .....	42
4.47	QVBYP<CR>: THE BYPASS SAMPLING VOLTAGE FINE-TURNING VALUE INQUIRY .....	42
4.48	QMAXW<CR>: CURRENT MAXIMUM WATT INQUIRY .....	42
4.49	QMXVA<CR>: CURRENT MAXIMUM VA INQUIRY .....	43
4.50	QPD<CR>: INQUIRY INPUT PHASE ANGLE AND OUTPUT PHASE ANGLE .....	43
4.51	QBCO<CR>: INQUIRY BATTERY CUT-OFF VOLTAGE AND BATTERY LOW VOLTAGE .....	43
4.52	QIPT<CR>: INQUIRY ACCEPTABLE INPUT LINE TYPE(FOR LINE-INTERACTIVE UPS) .....	43
4.53	QNL<CR>: INQUIRY NEUTRAL LOSS CHECK SETTING (FOR 2-2 6~10K, 3-1 3-3 10~20K) .....	43
4.54	QVFW3<CR> :THE THIRD CPU FIRMWARE VERSION INQUIRY(FOR 3-3 10~20K) .....	37
4.55	QBAT<CR>: INQUIRY BATTERY PARAMETER(FOR COMBO6~10K) .....	44
4.56	QTV<N><CR>: INQUIRY SET TEST VOLT (FOR COMBO6~10K RACK Li) .....	44
4.57	QVSOC<CR>: INQUIRY VOLTAGE OF START OVER CHARGE (FOR COMBO6~10K RACK Li) .....	44
4.58	QBTAH<CR>: THE BATTERY TOTAL AH INFORMATION INQUIRY .....	44
4.59	QPST<CR>: THE PERIOD OF PERIOD SELF TEST INQUIRY .....	44
4.60	QMF<CR>: THE MANUFACTURER INQUIRY .....	45
4.61	QTIME<CR>: CURRENT TIME INQUIRY .....	45
4.62	QSTZ<W><N><CR>: SCHEDULED TIME ZONE INQUIRY .....	45
4.63	QDWH<CR>: DISCHARGING WATT-HOUR INQUIRY .....	46
5	CONTROL COMMAND .....	46
5.1	T<CR>: 10 SECONDS TEST ---SPECIAL FOR OFF-LINE .....	46
5.2	T<CR>: 10 SECONDS TEST .....	46
5.3	TL<CR>: TEST UNTIL BATTERY LOW .....	46
5.4	T<N><CR>: TEST FOR SPECIFIED TIME .....	47
5.5	S<N><CR>: SHUTDOWN .....	47
5.6	S<N>R<M><CR>: SHUTDOWN AND RESTORE ---SPECIAL FOR OFF-LINE .....	47
5.7	S<N>R<M><CR>: SHUTDOWN AND RESTORE .....	47
5.8	CS<CR>: CANCEL SHUTDOWN .....	48

Case Name:		Date:		Num:	
Case Num:		Version:		PAGE	11/68

5.9	C<CR>: CANCEL SHUTDOWN---SPECIAL FOR OFF-LINE .....	48
5.10	CT<CR>: CANCEL TEST .....	48
5.11	SON<CR>: REMOTE TURN ON UPS.....	48
5.12	SOFF<CR>: REMOTE TURN OFF UPS.....	49
5.13	BZOFF<CR>: SILENCE BUZZER BEEP .....	49
5.14	BZON<CR>: BUZZER BEEP OPEN .....	49
5.15	Q<CR>: TOGGLE BEEP ---SPECIAL FOR OFF-LINE .....	49
5.16	SKON<N><CR>: REMOTE TURN ON UPS OUTPUT SOCKET .....	49
5.17	SKOFF<N><CR>: REMOTE TURN OFF UPS OUTPUT SOCKET .....	49
5.18	BZDT<CR>: TOGGLE BEEP .....	50
5.19	CLRPP<CR>: CLEAR PARALLEL PROTECT FLAG(FOR 1-1 6-10K) .....	50
5.20	TV<N><CR>:BATTEST UNTIL BAT VOL LOWER THAN <N>(FOR COMBO6-10) .....	50
<b>6</b>	<b>SETTING PARAMETERS COMMAND.....</b>	<b>50</b>
6.1	PE<XXX>/PD<XXX><CR>: SETTING SOME STATUS ENABLE/DISABLE.....	50
6.2	PSK<N><M><CR>: SET OUTPUT SOCKET RELEASE DELAY TIME IN BATTERY MODE.....	52
6.3	PSF<M><CR>: SET BYPASS FREQUENCY LOSS LOSS POINT .....	52
6.4	PGF<N><CR>: SET BYPASS FREQUENCY HIGH LOSS POINT.....	52
6.5	PLV<P><CR>: SET BYPASS VOLTAGE LOW LOSS POINT .....	52
6.6	PHV<Q><CR>: SET BYPASS VOLTAGE HIGH LOSS POINT.....	53
6.7	PF<CR>: SETTING CONTROL PARAMETER TO DEFAULT VALUE .....	53
6.8	PPD<NNN><CR>: SET OUTPUT PHASE ANGLE .....	54
6.9	BATN<NN><CR>: SETTING BATTERY PIECE NUMBER.....	54
6.10	BATGN<NN><CR>: SETTING BATTERY GROUP NUMBER .....	54
6.11	HEH<NNN><CR>: SET HIGH EFFICIENCY MODE VOLTAGE HIGH LOSS POINT .....	55
6.12	HEL<NNN><CR>: SET HIGH EFFICIENCY MODE VOLTAGE LOW LOSS POINT .....	55
6.13	FREH<NNN><CR>: SET FREE RUN MODE FREQUENCY HIGH LOSS POINT .....	55
6.14	HEFH<NN><CR>: SET HIGH EFFICIENCY MODE FREQUENCY HIGH LOSS POINT (FOR 10-20K) .....	55

Case Name:		Date:		Num:	
Case Num:		Version:		PAGE	12/68

6.15	HEFL<NN><CR>: SET HIGH EFFICIENCY MODE FREQUENCY LOW LOSS POINT (FOR 10-20K)	55
6.16	FREL<NNN><CR>: SET FREE RUN MODE FREQUENCY LOW LOSS POINT	55
6.17	BDR<NN><CR>: SETTING SCI BAUD RATE	56
6.18	ID< ABCDEEFFGXXXXX ><CR>: SETTING UPS ID	56
6.19	RESET<CR>: SETTING UPS OUTPUT VOLTAGE AND BUS VOLTAGE TO DEFAULT VALUE	56
6.20	REEP<CR>: SETTING EEPROM TO DEFAULT EXCEPT UPS ID	57
6.21	V<N><CR>: SETTING OUTPUT RATING VOLTAGE	57
6.22	BUS<N><CR>: SETTING BUS RATING VOLTAGE	57
6.23	F50<CR>: SETTING UPS OUTPUT RATING FREQUENCY TO 50HZ	57
6.24	F60<CR>: SETTING UPS OUTPUT RATING FREQUENCY TO 60HZ	57
6.25	CHGC<NN><CR>: SETTING CHARGING CURRENT OF THE CHARGER	58
6.26	MAXW<NNN><CR>: SETTING MAXIMUM WATT VALUE	58
6.27	MXVA<NNN><CR>: SETTING MAXIMUM VA VALUE	58
6.28	V±<N><CR>: FINE-TURNING OUTPUT VOLTAGE	58
6.29	VLINE±<N><CR>: FINE-TURNING LINE VOLTAGE SAMPLING VALUE	58
6.30	VBYP±<N><CR>: FINE-TURNING BYPASS VOLTAGE SAMPLING VALUE(FOR 1-1 6~10K)	59
6.31	BUSP±<N><CR>: FINE-TURNING POSITIVE BUS VOLTAGE	59
6.32	BUSN±<N><CR>: FINE-TURNING NEGATIVE BUS VOLTAGE	59
6.33	VB±<N><CR>: FINE-TURNING BATTERY VOLTAGE SAMPLING VALUE	59
6.34	V±<NN><CR>: FINE-TURNING INVERTER R VOLTAGE (FOR 2-2 6~10K, 3-1 3-3 10~20K)	59
6.35	VS±<NN><CR>: FINE-TURNING INVERTER S VOLTAGE (FOR 2-2 6~10K, 3-3 10~20K)	60
6.36	VT±<NN><CR>: FINE-TURNING INVERTER T VOLTAGE (FOR 3-3 10~20K)	60
6.37	VLINE±<NN><CR>: FINE-TURNING LINE_R VOLTAGE SAMPLING VALUE (FOR 2-2 6~10K, 3-1 3-3 10~20K)	60
6.38	VLINEB±<NN><CR>: FINE-TURNING LINE_S VOLTAGE SAMPLING VALUE (FOR 2-2 6~10K, 3-1 3-3 10~20K)	60
6.39	VLINEC±<NN><CR>: FINE-TURNING LINE_T VOLTAGE SAMPLING VALUE (FOR 3-1 3-3 10~20K)	61

Case Name:		Date:		Num:	
Case Num:		Version:		PAGE	13/68

6.40	VBYP $\pm$ <NN> <CR>: FINE-TURNING BYPASS R VOLTAGE SAMPLING VALUE (FOR 2-2 6~10K, 3-1 3-3 10~20K)	61
6.41	VBYPB $\pm$ <NN> <CR>: FINE-TURNING BYPASS S VOLTAGE SAMPLING VALUE (FOR 2-2 6~10K, 3-3 10~20K)	61
6.42	VBYPCT $\pm$ <N> <CR>: FINE-TURNING BYPASS T VOLTAGE SAMPLING VALUE (FOR 3-3 10~20K)	61
6.43	BUSP $\pm$ <NN><CR>: FINE-TURNING POSITIVE BUS VOLTAGE (FOR 2-2 6~10K, 3-1 3-3 10~20K)	61
6.44	BUSN $\pm$ <NN><CR>: FINE-TURNING NEGATIVE BUS VOLTAGE (FOR 2-2 6~10K, 3-1 3-3 10~20K)	62
6.45	VB $\pm$ <NN><CR>: FINE-TURNING BATTERY VOLTAGE SAMPLING VALUE (FOR 2-2 6~10K, 3-1 3-3 10~20K)	62
6.46	VC $\pm$ <NN><CR>: FINE-TURNING CHARGER VOLTAGE SAMPLING VALUE (FOR 2-2 6~10K, 3-1 3-3 10~20K)	62
6.47	VOP $\pm$ <NN> <CR>: FINE-TURNING OUTPUT R VOLTAGE (FOR 2-2 6~10K, 3-1 3-3 10~20K)	62
6.48	VOPS $\pm$ <NN> <CR>: FINE-TURNING OUTPUT S VOLTAGE (FOR 2-2 6~10K, 3-3 10~20K)	63
6.49	VOPT $\pm$ <NN> <CR>: FINE-TURNING OUTPUT T VOLTAGE (FOR 3-3 10~20K)	63
6.50	BATCO<N.NN> <CR>: SETTING THE BATTERY MINIMUM CUT-OFF VOLTAGE PER CELL	63
6.51	IPT<T> <CR>: SETTING THE ACCEPTABLE INPUT LINE TYPE (FOR LINE-INTERACTIVE UPS)	63
6.52	NL<NNN><CR>: SETTING NEUTRAL LOSS CHECK (FOR 2-2 6~10K, 3-1 3-3 10~20K)	64
6.53	BATCAP<NN><CR>: SETTING BATTERY CAPACITY (FOR COMBO6-10K)	64
6.54	BATCOEF<N.N><CR>: SETTING BATTERY CAPACITY COEFFICIENT (FOR COMBO6-10K)	64
6.55	VDCR $\pm$ <NN> <CR>: FINE-TURNING INVERTER R DC VOLTAGE (FOR 3-3 10~20K)	64
6.56	VDCS $\pm$ <NN> <CR>: FINE-TURNING INVERTER S DC VOLTAGE (FOR 3-3 10~20K)	65
6.57	VDCT $\pm$ <NN> <CR>: FINE-TURNING INVERTER T DC VOLTAGE (FOR 3-3 10~20K)	65
6.58	VSOC<NNN> <CR>: SET VOLTAGE OF START OVER CHARGE (FOR COMBO6-10K RACK LI)	65
6.59	BATTAH<NNNN><CR>: SETTING BATTERY TOTAL AH	65
6.60	PST<PP><CR>: SETTING THE PERIOD OF PERIOD SELF TEST	66
6.61	TSET<YYYYMMWDDHHNNSS><CR>: SET TIME	66
6.62	STSET<W><N><AAAABBBBCCCCDDDD><CR>: SET SCHEDULED TIME ZONE	66

Case Name:		Date:		Num:	
Case Num:		Version:		PAGE	14/68

6.63	DWHRST<CR>: RESET DISCHARGING WATT-HOUR INFORMATION IN EEPROM.....	67
6.64	MM<XXX.....><CR>: MODIFY MANUFACTURER NAME; (ONLY FOR X9) .....	67
6.65	MU<XXX.....><CR>: MODIFY UPS UNIT NAME; (ONLY FOR X9).....	67
6.66	MD<NNNN><CR>: MODIFY MANUFACTURER NAME; (ONLY FOR X9) .....	67
6.67	PP1E<CR>: ENABLE THE OUTPUT PROGRAM FUNCTION ; (ONLY FOR X9) .....	67
6.68	PP1D<CR>: DISABLE THE OUTPUT PROGRAM FUNCTION; (ONLY FOR X9).....	67

Case Name:		Date:		Num:	
Case Num:		Version:		PAGE	15/68

# 1 Document Description

## 1.1 Goals

This document specifies the RS232 communication protocol used in the UPS.

## 1.2 Organization

There are three parts in this manual:

1. Introducing the Inquiry Command. By sending the commands you can get the information of the UPS you need. In the part some signals and their inquiry command are listed too.
2. Introducing the control Command. By sending the control commands you can control the UPS.
3. Introducing the parameter setting Command. By sending the parameter setting Command you can set some parameter of the UPS.
4. Computer will control information exchange by a query followed by <cr>.
5. Computer and UPS respond both the "<cr>" as the end of a response.
6. UPS respond with "((" start, and with one space separate the data.  
(exception: off-line Arista UPS)
7. In a UPS's response, if there is no data, with "-" instead of data, and the length of the "-" as long as data.(UPS 在回复查询中, 若在一个命令的回复中本机有部分数据不存在就以字符 "-" 替代, "-" 数量与缺省的数据位相同.)
8. In a UPS's response, if some data length is less than the definition, type enough "#" before the data.(UPS 在回复查询中, 若在一个命令的回复中本机有部分数据长度不足, 则在此数据的前面加 "#" 补足位数.)

## 1.3 Reference document

## 1.4 Glossary – Abbreviations – Notations

# 2 Hardware Description

BAUD RATE.....: 2400 bps

DATA LENGTH.....: 8 bits

STOP BIT.....: 1 bit

Case Name:		Date:		Num:	
Case Num:		Version:		PAGE	16/68

PARITY.....: NONE

Cabling:

COMPUTER		UPS
=====		
RX (pin2)	<----->	TX
TX (pin3)	<----->	RX
GND (pin5)	<----->	GND
(9 pins female D-type connector)		

### 3 Command supported by Software



ViewPower  
Commands List for

### 4 Inquiry Command

#### 4.1 QPI<cr>: Protocol ID Inquiry

Computer: QPI<cr>

UPS: (PI <NN><cr>

N is an integer number ranging from 0 to 9.

Function : To request the UPS Protocol ID.

#### 4.2 - M<cr>: UPS password----Special for off-line

Computer: M<cr>

UPS: V<cr>

Function : To request the UPS password which identify the Arista UPS.

#### 4.3 QS<cr>: UPS Status parameters Inquiry----Special for off-line

Computer: QS<cr>

UPS: (MMM.M NNN.N PPP.P QQQ RR.R SS. S TT.T b7b6b5b4b3b2b1b0<cr>

Function : To obtain UPS current status and data

Note:



Case Name:		Date:		Num:	
Case Num:		Version:		PAGE	17/68

One space (ASCII Hex: 20H) is added between each data stream for the data separation.  
All data should capture at same timing when UPS receive this command.

Item	Data	description	Unit
a	(	Start code	
b	MMM.M	Input voltage	V rms
c	NNN.N	Input fault voltage	V rms
d	PPP.P	Output voltage	V rms
e	QQQ	Output load	Percentage (%)
f	RR.R	Output frequency	Hz
g	SS.S	Battery voltage	V rms
h	TT.T	Internal temperature	Degree-C
i	U	UPS status	(8 bits)

a. Start byte : (

b. I/P voltage : MMM.M

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

c. I/P fault voltage: NNN.N

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

Note:

Its purpose is to identify a short duration voltage glitch which cause off line UPS to go to Inverter mode. If this occurs, the input voltage will appear normal at query prior to glitch and will still appear normal at next query.

The I/P fault voltage will hold glitch voltage till next query. After query, the I/P fault voltage will be same as I/P voltage until next glitch occurs.

d. O/P voltage : PPP.P

P is an integer number ranging form 0 to 9. The unit is Volt.

If there is no output, the value must be forced to 000.0.

e. Load percentage: QQQ

QQQ is a percentage of rated load capability, not an absolute value.

If there is no output, the value must be forced to 000.

Case Name:		Date:		Num:	
Case Num:		Version:		PAGE	18/68

f. O/P frequency: RR.R

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

If the output frequency is high than 99.9Hz, force the value to 99.9.

If there is no output, the value must be forced to 00.0.

g. Battery voltage: SS.S

S is an integer number ranging from 0 to 9. For off-line UPS, the actual battery voltage is provided in the form SS.S.

h. Temperature : TT.T

T is an integer number ranging form 0 to 9. The unit is degree Celsius.

If the value can't be obtained, fill the field with '25.0'.

i. UPS Status : <U>

<U> is one byte of binary information such as <b7b6b5b4b3b2b1b0>. Where bn is a character of ASCII '0' or '1'.

UPS status:

Bit	Logic 1	Logic 0
b7	Utility Fail	Utility OK
b6	Battery Low	No Battery Low
b5	Boost or Buck mode	Neither boost nor buck mode
b4	UPS is fault	UPS is not fault
b3	UPS Type is Line-Interactive	UPS Type is On-line
b2	UPS is in self test progress	UPS is not in self test progress
b1	UPS is in Shutdown Active status	UPS is not in Shutdown Active status
b0	Beeper is Active	Beeper is Mute

j. Stop Byte : <cr>

For example:

Computer: QS<cr>

UPS: (208.4 140.0 208.4 034 59.9 12.8 35.0 00110000<cr>

Means:

I/P voltage is 208.4V,

Case Name:		Date:		Num:	
Case Num:		Version:		PAGE	19/68

I/P fault voltage is 140.0V,  
O/P voltage is 208.4V,  
O/P load percent is 34 %.  
O/P frequency is 59.9 HZ,  
Battery voltage is 12.8V,  
Temperature is 35.0 degrees of centigrade.  
UPS type is on-line, UPS failed. AVR active, and shutdown not active.

#### 4.4 QMD<cr>: Model Inquiry

Computer: QMD<cr>

UPS: (TTTTTTTTTTTTTTTT WWWWWW KK P/P MMM NNN RR BB.B <cr>

(a) UPS Model: TTTTTTTTTTTTTTT

This whole length is 15bits, if the model value less than 15 bits, please enter “#” before the UPS model instead, for example: #####G10KS.

(b) Output rated VA: WWWWWW

W is an integer number ranging from 0 to 9. The unit is watt.

The whole length is 7 bits, if the VA value less than 7 bits, please enter “#” before the VA value instead, for example: ##10000.

(c) Output power factor: KK

K is an integer number ranging from 0 to 9.

KK is the percentage of power factor, for example: 70

(d) Input phase/Output phase: P/P

P is an integer number of 1 or 3.

(e) Nominal I/P Voltage: MMM

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

(f) Nominal O/P Voltage: NNN

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

(f) Battery Piece Number: RR

R is an integer number ranging from 0 to 9.

(g) Battery standard voltage per unit: BB.B

B is an integer number ranging from 0 to 9. The unit is volt.

For example:

Computer: QMD<cr>

UPS: (#####G10KS ##10000 70 1/1 220 220 20 12.0<cr>

Case Name:		Date:		Num:	
Case Num:		Version:		PAGE	20/68

#### 4.5 QGS<cr>: The general status parameters inquiry

Computer: QGS<cr>

UPS: (MMM.M HH.H LLL.L NN.N QQQ.Q DDD KKK.K VVV.V SSS.S XXX.X TTT.T  
b9b8b7b6b5b4b3b2b1b0a0a1<cr>

	Data	Description	Notes
a	(	Start byte	
b	MMM.M	Input voltage	M is an Integer number 0 to 9. The units is V.
c	HH.H	Input frequency	H is an Integer number 0 to 9. The units is Hz.
d	LLL.L	Output voltage	L is an Integer number 0 to 9. The units is V.
e	NN.N	Output frequency	N is an Integer number from 0 to 9. The units is Hz.
g	QQQ.Q	Output current	Q is an Integer number from 0 to 9. The units is A.
h	DDD	Output load percent	For Off-line UPS: DDD is a percent of maximum VA, not an absolute value. For On-line UPS: DDD is Maximum of W% or VA%. VA% is a percent of maximum VA. W% is a percent of maximum real power.
j	KKK.K	Positive BUS voltage	K is an Integer ranging from 0 to 9. The units is V.
k	VVV.V	Negative BUS voltage	V is an Integer ranging from 0 to 9. The units is V.
l	SSS.S	P Battery voltage	S is an Integer ranging from 0 to 9. The units is V.
m	XXX.X	N Battery voltage	X is an Integer ranging from 0 to 9. The units is V.
n	TTT.T	Max Temperature of the detecting pointers	T is an integer ranging from 0 to 9. The units is °C
o	b9b8b7b6b5b4b3b2b1b0a0a1	Ups status	B9,b8: 00: standy; 01: line-interactive; 10: on-line. B7: Utility Fail b6: Battery Low b5: Bypass/Boost Active b4: UPS Failed b3: EPO b2: Test in Progress b1: Shutdown Active

Case Name:		Date:		Num:	
Case Num:		Version:		PAGE	21/68

			b0: bat silence a0: Bat test fail a1: Bat test OK
--	--	--	---

Example:

Computer: QGS<cr>

UPS: (220.2 50.0 220.0 50.0 027.0 100 345.8 344.9 241.0 241.5 045.0 100011000000<cr>

Means:

I/P voltage is 220.2V.

I/P frequency is 50.0Hz

O/P voltage is 220.0V

O/P frequency is 50.0Hz.

O/P current is 27.0A

O/P load 100%

Positive BUS voltage is 345.8V

Negative BUS voltage is 344.9V

P Battery voltage is 241.0V.

N Battery voltage is 241.5V.

Temperature is 45.0 degrees of centigrade.

On-line mode, Utility OK, Bypass Active, UPS failed.

#### 4.6 QFS<cr>: Fault Status Inquiry

If there are no UPS fail occur:

computer: QFS<cr>

UPS: (OK<cr> (no fault)

If there are UPS fail occur:

Computer: QFS<cr>

UPS: (KK PPP.P FF.F OOO.O EE.E LLL CCC.C HHH.H NNN.N BBB.B TTT.T  
<b7b6b5b4b3b2b1b0><cr>

Fault 类别	Fault 名称	Fault 代码	Fault 描述
Bus fault	Bus start fail	0x01	规定时间内, bus 电压未达到设定值。
	Bus volt over	0x02	Bus 电压超过上限值。
	Bus volt under	0x03	Bus 电压低于下限值。

Case Name:		Date:		Num:	
Case Num:		Version:		PAGE	22/68

	Bus volt unbalance	0x04	正负 Bus 电压之差超出允许范围。
	Bus short	0x05	Bus 电压下降斜率过快。
	PFC over current	0x06	PFC 输入电感电流过大。
Inverter fault	Inverter soft fail	0x11	规定时间内, inverter 电压未达到设定值。
	Inverter volt high	0x12	Inverter 电压超过上限值。
	Inverter volt low	0x13	Inverter 电压低于下限值。
	L1 inverter short	0x14	L1 inverter 相短路。
	L2 inverter short	0x15	L2 inverter 相短路。
	L3 inverter short	0x16	L3 inverter 相短路。
	L1L2 inverter short	0x17	L1L2 inverter 线短路。
	L2L3 inverter short	0x18	L2L3 inverter 线短路。
	L3L1 inverter short	0x19	L3L1 inverter 线短路。
	L1 inverter negative power	0x1A	L1 inverter 负功超出允许范围。
	L2 inverter negative power	0x1B	L2 inverter 负功超出允许范围。
L3 inverter negative power	0x1C	L3 inverter 负功超出允许范围。	
Electric link fault	Bat SCR fault	0x21	Battery scr 短路故障
	Line SCR fault	0x22	Line scr 短路故障
	Inverter relay open fault	0x23	Inverter relay 开路故障
	Inverter relay short fault	0x24	Inverter relay 短路故障
	Wiring fault	0x25	输入输出线路接反
	Battery reverse fault	0x26	电池反接故障
	Battery too high	0x27	电池电压过高, 远超出 over charge 点。
	Battery too low	0x28	电池电压过低, 远低于 shut down 点。
	Battery Fuse Open-Circuit Fault	0x29	电池 fuse 开路故障
Parallel system fault	CAN communication fault	0x31	CAN bus 通信故障。
	Host line fault	0x32	主机信号线路故障。
	Synchronization line fault	0x33	同步信号线路故障。
	Synchronization pulse line fault	0x34	同步触发信号线路故障,

Case Name:		Date:		Num:	
Case Num:		Version:		PAGE	23/68

	Parallel communication line loss	0x35	并机通信线路丢失故障。
	Output circuit fault	0x36	输出严重不均流故障。
Others	Over temperature	0x41	UPS 工作温度过高故障。
	CPU communication fault	0x42	控制板中 CPU 间通信故障。
	Overload fault	0x43	过载故障。
	Fan fault	0x44	风扇模组故障。
	Charger fault	0x45	充电器故障。
	Model fault	0x46	机型错误
	MCU communication fault	0x47	控制板与通讯板 MCU 通信故障
	DSP firmware version incompatible	0x48	控制板固件版本不兼容

(a) Start byte: (

(b) Fault kind: KK

K is 2 bytes of ASCII code, define as following:

(c) I/P voltage before fault: PPP.P

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

(d) I/P frequency before fault: FF.F

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

(e) Inverter O/P voltage before fault: OOO.O

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

(f) Inverter O/P frequency before fault: EE.E

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

(g) O/P load before fault: LLL

LLL is the maximum of W% or VA%.

VA% is a percent of maximum VA.

W% is a percent of maximum real power.

(h) O/P current before fault: CCC.C

CCC is a percent of maximum current.

(i) Positive Bus voltage before fault: HHH.H

P is an integer number ranging from 0 to 9. The unit is volt.

(j) Negative Bus voltage before fault: NNN.N

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

Case Name:		Date:		Num:	
Case Num:		Version:		PAGE	24/68

(k) Battery voltage before fault: BBB.B

B is an integer number ranging from 0 to 9. The unit is volt

(l) Temperature before fault: TTT.T

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

(m) UPS running status before fault: <b7b6b5b4b3b2b1b0>

<b7b6b5b4b3b2b1b0> is one byte of binary information.

Each bit is transferred into ASCII code. <bn> is a binary number “0” or “1”.

Bit	Remarks
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)

This fault data stream will be saved into EEPROM.

Example:

Computer: QFS<cr>

UPS: (01 208.3 41.0 160.2 50.0 102 027.0 160.0 190.0 041.0 069.0 01101100<cr>

Means: Bus start fault.

I/P voltage is 208.3V.

I/P frequency is 41.0HZ.

O/P voltage is 160.2V.

O/P frequency is 50.0HZ

Load is 102%

O/P current is 27.0A

Positive Bus voltage is 160.0V

Negative Bus voltage is 190.0V

Battery voltage is 41.0V.

Temperature is 69.0 °C

IC3525 off, PFC on, INVERTER on, input relay on, O/P relay on



Case Name:		Date:		Num:	
Case Num:		Version:		PAGE	25/68

#### 4.7 QWS<cr>: Warning Status Inquiry

Computer: QWS<cr>

UPS: (a0a1.....a62a63<cr>

a0,...,a63 is the warning status. If the warning is happened, the relevant bit will set 1, else the relevant bit will set 0. The following table is the warning code.

bit	Warning code	warning	note
a0	01	Battery open	电池未接报警。
a1	02	IP N loss	输入 N 线丢失报警。
a2	03	IP site fail	输入零火线接反报警。
a3	04	Line phase error	三相输入时，市电 L1/L2/L3 相序错误。
a4	05	Bypass phase error	三相输入时，旁路 L1/L2/L3 相序错误。
a5	06	Bypass frequency unstable	旁路输入频率变化过快，超出 UPS 锁相能力。
a6	07	Battery over charge	电池过充报警。
a7	08	Battery low	电池低压报警。
a8	09	Overload warning	过载报警。
a9	0A	Fan lock warning	风扇模组堵转报警。
a10	0B	EPO active	EPO 开关生效。
a11	0C	Turn on abnormal	系统不允许开机。
a12	0D	Over temperature	过温报警。
a13	0E	Charger fail	充电器报警。
a14	0F	Remote shut down	远程自动关机报警。
a15	10	L1 IP fuse fail	L1 输入保险开路报警。
a16	11	L2 IP fuse fail	L2 输入保险开路报警。
a17	12	L3 IP fuse fail	L3 输入保险开路报警。
a18	13	L1 PFC positive error	L1 正边 PFC 工作异常，连续 48 个 count PWM 输出始终为满偏。
a19	14	L1 PFC negative error	L1 负边 PFC 工作异常，连续 48 个 count PWM 输出始终为满偏。
a20	15	L2 PFC positive error	L2 正边 PFC 工作异常，连续 48 个 count PWM 输出始终为满偏。
a21	16	L2 PFC negative error	L2 负边 PFC 工作异常，连续 48 个 count PWM 输出始终为满偏。
a22	17	L3 PFC positive error	L3 正边 PFC 工作异常，连续 48 个 count PWM 输出始终为满偏。
a23	18	L3 PFC negative error	L3 负边 PFC 工作异常，连续 48 个 count

Case Name:		Date:		Num:	
Case Num:		Version:		PAGE	26/68

			PWM 输出始终为满偏。
a24	19	CAN communication error	CAN bus 通信报警。
a25	1A	Synchronization line error	同步信号线路报警。
a26	1B	Synchronization pulse error	同步触发信号线路报警。
a27	1C	Host line error	主机信号线路报警。
a28	1D	Male connection error	并机通信线公端连接脱落报警。
a29	1E	Female connection error	并机通信线母端连接脱落报警。
a30	1F	Parallel line connection error	并机通信线脱落报警
a31	20	Battery connect different	并机系统各模块电池连接不一致。
a32	21	Line connect different	并机系统各模块市电连接不一致。
a33	22	Bypass connect different	并机系统各模块旁路连接不一致。
a34	23	Mode type different	并机系统中各 UPS 机种类型不一致。
a35	24	Parallel inverter voltage setting different	并机系统逆变电压设置不一致。
a36	25	Parallel output frequency setting different	并机系统输出频率设置不一致。
a37	26	Battery cell over charge	电池单体过充电
a38	27	Parallel output parallel setting different	并机系统输出并联设置不一致。
a39	28	Parallel output phase setting different	并机系统输出相角设置不一致。
a40	29	Parallel Bypass Forbidden setting different	并机系统旁路禁止标志位设置不一致。
a41	2A	Parallel Converter Enable setting different	并机系统 CVCF 标志位设置不一致。
a42	2B	Parallel Bypass Freq High loss setting different	并机系统旁路频率丢失点上限设置不一致。
a43	2C	Parallel Bypass Freq Low loss setting different	并机系统旁路频率丢失点下限设置不一致。
a44	2D	Parallel Bypass Volt High loss setting different	并机系统旁路电压丢失点上限设置不一致。
a45	2E	Parallel Bypass Volt Low Loss setting different	并机系统旁路电压丢失点下限设置不一致。
a46	2F	Parallel Line Freq High Loss setting different	并机系统市电频率丢失点上限设置不一致。
a47	30	Parallel Line Freq Low Loss setting different	并机系统市电频率丢失点下限设置不一致。
a48	31	Parallel Line Volt High Loss setting different	并机系统市电电压丢失点上限设置不一致。

Case Name:		Date:		Num:	
Case Num:		Version:		PAGE	27/68

a49	32	Parallel Line Volt Low Loss setting different	并机系统市电电压丢失点下限设置不一致。
a50	33	Locked in bypass after overload 3 times in 30min	30 分钟内过载三次锁在旁路告警。
a51	34	Warning for three-phase AC input current unbalance	PFC 输入电流不平衡告警。
a52	35	Battery fuse broken	电池保险开路告警。
a53	36	Inverter inter-current unbalance	逆变并板不均流告警。
a54	37	P1 cut off pre-alarm	P1 切断预警
a55	38	Warning for Battery replace	电池需要更换告警
a56	39	Warning for input phase error for LV 6-10K UPS	输入相角不正常告警
a57	3A	Cover of maintain switch is open	维护旁路开路报警
a58	3B	Phase Auto Adapt Failed	相位自动侦测失败
a59	3C	Utility extremely unbalanced	市电电压极度不平衡
A60	3D	Bypass unstable	旁路状态不稳定
A61	3E	EEPROM operation error	EEPROM 操作异常
A62	3F	Parallel protect warning	并机保护告警。提示机器上次运行时出现了并机通讯线丢失故障。
A63	40	Discharger overly	电池过放电告警,需要进行保护

#### 4.8 -QWF<cr>: Warning Status and Fault status Inquiry---for taurus

Computer: QWF<cr>

UPS: (a0a1.....a62a63...a79<cr>

a0,...,a79 is the warning status. If the warning is happened, the relevant bit will set 1, else the relevant bit will set 0. The following table is the warning code.

bit	Warning and Fault
a0	Rectifier Overload.
a1	Inverter Overload.
a2	Mains Failure. Battery Low Level.
a3	Inverter Voltage Out of Margins.
a4	DC Voltage Detected at the Output.
a5	Maintenance Bypass. Inverter Not Available.
a6	Mains Failure. Battery Discharging.
a7	High Temperature. Reduce Output Load.

Case Name:		Date:		Num:	
Case Num:		Version:		PAGE	28/68

a8	Battery Switch Open. Switch it ON.
a9	Bypass Failure. Not Synchronised Inverter.
a10	Unit on Bypass. Initialise UPS.
a11	Some Unit(s) Blocked due to Maintenance Bypass.
a12	CAN BUS 1 Communication Failure.
a13	CAN BUS 2 Communication Failure.
a14	End of Battery Life.
a15	Battery Temperature too High.
a16	Battery Test Not Succeeded.
a17	Battery Disconnection. Shutdown & Restart.
a18	Mains Phase Rotation. UPS Start Disabled.
a19	Bypass Phase Rotation. UPS Start Disabled.
a20	Input Voltage Wrong. Rectifier Stop.
a21	Rectifier Desaturation. Rectifier Stop.
a22	DSP Internal Error. Rectifier Stop.
a23	Input Phase Rotation. Rectifier Stop.
a24	Inverter Desaturation. Inverter Stop.
a25	Inverter Overload. Inverter Stop.
a26	Inverter Stopped due to Shutdown.
a27	Maintenance Bypass. Inverter Stop.
a28	Parallel System Disconnection. Inverter Stop.
a29	High Overload. Inverter Stop.
a30	Overtemperature. Inverter Stop.
a31	Rectifier Overload. Inverter Stop.
a32	DSP Internal Error. Inverter Stop.
a33	Output Short-circuit. Inverter Stop.
a34	Bypass Phase Rotation. Inverter Stop.
a35	DSP Internal Error. UPS Stop.
a36	Low Battery. UPS Stop.
a37	Emergency Power Off. No Output Voltage.
a38	Output Short-circuit. No Output Voltage.
a39	DSP Internal Error. UPS Block All.
a40	DC BUS Voltage Wrong. Rectifier Block.
a41	Rectifier Blocked. BLK. UPS -> BLK Rectifier.
a42	Rectifier Desaturations. Rectifier Block.
a43	Voltage Ramp Error. Rectifier Block.
a44	DSP Execution Error. Rectifier Block.
a45	DSP Internal Error. Rectifier Block.
a46	Contactors Test Failure. Rectifier Block.

Case Name:		Date:		Num:	
Case Num:		Version:		PAGE	29/68

a47	Voltage Ramp Error. Inverter Block.
a48	Output DC Voltage. Inverter Block.
a49	Inverter Blocked. BLK. UPS -> BLK Inverter.
a50	Inverter Desaturations. Inverter Block.
a51	DSP Execution Error. Inverter Block.
a52	DSP Internal Error. Inverter Block.
a53	UPS Blocked. BLK. Rectifier -> BLK. UPS.
a54	Internal Initialisation Error. UPS Block (DSP).
a55	Internal Execution Error. UPS Block (DSP).
a56	UPS Blocked. BLK. Inverter -> BLK. UPS.
a57	Internal Communication. UPS Block (DSP).
a58	Parallel System Discharging. UPS Block.
a59	UPS Overtemperature. UPS Block.
a60	Rectifier Overload. UPS Block.
a61	Inverter Desaturations. UPS Block.
a62	DSP Internal Error. UPS Block.
a63	PFC & Inverter Blockage. UPS Block.
a64	Inverter Failure. Inverter Stop.
a65	Inverter Failure. Inverter Block.
a66	Voltage Ramp Error. Inverter Stop.
a67	DC BUS Voltage Wrong. Rectifier Stop.
a68-a79	Reserved.

#### 4.9 QMOD<cr>: UPS Mode inquiry

Computer: QMOD<cr>

UPS: (M<cr>

Mode	Code(M)
Power on mode	P
Standby mode	S
Bypass mode	Y
Line mode	L
Battery mode	B
Battery test mode	T
Fault mode	F

Case Name:		Date:		Num:	
Case Num:		Version:		PAGE	30/68

HE/ECO mode	E
Converter mode	C
Shutdown mode	D

For example:

Computer: QMOD<cr>

UPS: (Y<cr>

means: the current UPS mode is bypass mode.

#### 4.10 QRI<cr>: UPS Rating Information inquiry

Computer: QRI<cr>

UPS: (MMM.M QQQ SSS.S RR.R<cr>

This function makes the UPS answer the rating value of UPS. There should be a space character between every field for separation. The UPS's response contains the following information field:

- a. Rating Output Voltage : MMM.M
- b. Rating Output Current : QQQ
- c. Battery Voltage: SSS.S.
- d. Rating Output Frequency : RR.R

#### 4.11 F<cr>: UPS Rating Information inquiry----Special for off-line

Computer: F<cr>

UPS: #MMM.M QQQ SS.SS RR.R<cr>

Function : This command makes the UPS answer the rating value of UPS. There should be a space character between every field for separation. The UPS's response contains the following information field:

- (1) Output Rating Voltage: MMM.M
- (2) Output Rating Current: QQQ
- (3) Battery Voltage : SS.SS(less than 99.99V) or SSS.S(99.99V upwards)
- (4) Output Rating Frequency: RR.R

#### 4.12 Q3PV<cr>: The input three phase voltage inquiry

Computer: Q3PV<cr>

UPS: (RRR.R SSS.S TTT.T AAA.A BBB.B CCC.C<cr>

	Data	Description	Notes
a	(	Start byte	

Case Name:		Date:		Num:	
Case Num:		Version:		PAGE	31/68

b	RRR.R	R voltage	R is an Integer number 0 to 9. The units is V.
c	SSS.S	S voltage	S is an Integer number 0 to 9. The units is V.
d	TTT.T	T voltage	T is an Integer number 0 to 9. The units is V.
e	AAA.A	Line voltage of RS	A is an Integer number 0 to 9. The units is V.
f	BBB.B	Line voltage of ST	B is an Integer number 0 to 9. The units is V.
g	CCC.C	Line voltage of TR	C is an Integer number 0 to 9. The units is V.

Example:

Computer: Q3PV<cr>

UPS: (220.2 215.3 222.1 381.4 373.2 384.6<cr>

Means:

R voltage is 220.2V.

S voltage is 215.3V.

T voltage is 222.1V.

Line voltage of RS is 381.4V.

Line voltage of ST is 373.2V.

Line voltage of TR is 384.6V.

#### 4.13 Q3PC<cr>: The input three phase current inquiry

Computer: Q3PC<cr>

UPS: (RRR.R SSS.S TTT.T<cr>

	Data	Description	Notes
a	(	Start byte	
b	RRR.R	R current	R is an Integer number 0 to 9. The units is A.
c	SSS.S	S current	S is an Integer number 0 to 9. The units is A.
d	TTT.T	T current	T is an Integer number 0 to 9. The units is A.

Example:

Computer: Q3PC<cr>

UPS: (045.2 044.3 045.1<cr>

Means:

R current is 45.2A.

S current is 44.3A.

T current is 45.1A.

Case Name:		Date:		Num:	
Case Num:		Version:		PAGE	32/68

#### 4.14 Q30V<cr>: The output three phase voltage inquiry

Computer: Q30V<cr>

UPS: (RRR.R SSS.S TTT.T AAA.A BBB.B CCC.C<cr>

	Data	Description	Notes
a	(	Start byte	
b	RRR.R	R phase Output voltage	R is an Integer number 0 to 9. The units is V.
c	SSS.S	S phase Output voltage	S is an Integer number 0 to 9. The units is V.
d	TTT.T	T phase Output voltage	T is an Integer number 0 to 9. The units is V.
e	AAA.A	output voltage of RS	A is an Integer number 0 to 9. The units is V.
f	BBB.B	output voltage of RT	B is an Integer number 0 to 9. The units is V.
g	CCC.C	output voltage of ST	C is an Integer number 0 to 9. The units is V.

#### 4.15 Q30C<cr>: The output three phase current inquiry

Computer: Q30C<cr>

UPS: (RRR.R SSS.S TTT.T <cr>

	Data	Description	Notes
a	(	Start byte	
b	RRR.R	R phase Output current	R is an Integer number 0 to 9. The units is A.
c	SSS.S	S phase Output current	S is an Integer number 0 to 9. The units is A.
d	TTT.T	T phase output current	T is an Integer number 0 to 9. The units is A.

#### 4.16 Q3YV<cr>: The bypass three phase voltage inquiry

Computer: Q3YV<cr>

UPS: (RRR.R SSS.S TTT.T AAA.A BBB.B CCC.C<cr>

	Data	Description	Notes
a	(	Start byte	
b	RRR.R	R voltage of bypass	R is an Integer number 0 to 9. The units is V.
c	SSS.S	S voltage of bypass	S is an Integer number 0 to 9. The units is V.
d	TTT.T	T voltage of bypass	T is an Integer number 0 to 9. The units is V.
e	AAA.A	bypass voltage of RS	A is an Integer number 0 to 9. The units is V.
f	BBB.B	bypass voltage of ST	B is an Integer number 0 to 9. The units is V.
g	CCC.C	bypass voltage of TR	C is an Integer number 0 to 9. The units is V.



Case Name:		Date:		Num:	
Case Num:		Version:		PAGE	33/68

Example:

Computer: Q3YV<cr>

UPS: (220.2 215.3 222.1 378.5 379.0 380.2<cr>

Means:

R voltage of bypass is 220.2V.

S voltage of bypass is 215.3V.

T voltage of bypass is 222.1V.

RS voltage of bypass is 378.5V.

ST voltage of bypass is 379.0V.

TR voltage of bypass is 380.2V.

#### 4.17 QYF <cr>: The bypass frequency inquiry

Computer: QYF<cr>

UPS: (FF.F <cr>

	Data	Description	Notes
a	(	Start byte	
b	FF.F	frequency of bypass	F is an Integer number 0 to 9. The units is Hz.

Example:

Computer: QYF<cr>

UPS: (49.9<cr>

Means:

Frequency of bypass is 49.9Hz.

#### 4.18 Q3YC<cr>: The bypass three phase current inquiry

Computer: Q3YC<cr>

UPS: (RRR.R SSS.S TTT.T<cr>

	Data	Description	Notes
a	(	Start byte	
b	RRR.R	R current	R is an Integer number 0 to 9. The units is A.
c	SSS.S	S current	S is an Integer number 0 to 9. The units is A.
d	TTT.T	T current	T is an Integer number 0 to 9. The units is A.

Case Name:		Date:		Num:	
Case Num:		Version:		PAGE	34/68

Example:

Computer: Q3YC<cr>

UPS: (045.2 044.3 045.1<cr>

Means:

R current is 45.2A.

S current is 44.3A.

T current is 45.1A.

#### 4.19 Q3LD<cr>: The three phase load inquiry

Computer: Q3LD<cr>

UPS: (RRR SSS TTT AAA<cr>

	Data	Description	Notes
a	(	Start byte	
b	RRR.R	R phase of load	R is an Integer number 0 to 9. The units is %.
c	SSS.S	S phase of load	S is an Integer number 0 to 9. The units is %.
d	TTT.T	T phase of load	T is an Integer number 0 to 9. The units is %.
e	AAA.A	The whole load	A is an Integer number 0 to 9. The units is %.

Example:

Computer: Q3LD<cr>

UPS: (045.2 042.3 047.0 050.1<cr>

Means:

R phase of load is 45.2%.

S phase of load is 42.3%.

T phase of load is 47.0%.

The whole load is 50.1%

#### 4.20 -QRPV<cr>: The Input R phase voltage inquiry

	Data	Description	Notes
a	(	Start byte	
b	RRR.R	R voltage	R is an Integer number 0 to 9. The units is V.
c	AAA.A	Maximum voltage of R phase	A is an Integer number 0 to 9. The units is V.

Case Name:		Date:		Num:	
Case Num:		Version:		PAGE	35/68

d	CCC.C	Minimum voltage of R phase	C is an Integer number 0 to 9. The units is V.
---	-------	----------------------------	--

#### 4.21 QBYV<cr>: The bypass voltage range inquiry

Computer: QBYV<cr>

UPS: (HHH LLL <cr>

	Data	Description	Notes
a	(	Start byte	
b	HHH	Voltage high loss point	H is an Integer number 0 to 9. The unit is V.
c	LLL	Voltage low loss point	L is an Integer number 0 to 9. The unit is V.

The bypass voltage rang from 176 to 264, default 176V, the precision is 1 volt.

#### 4.22 QBYF<cr>: The bypass frequency range inquiry

Computer: QBYF<cr>

UPS: (HH.H LL.L <cr>

	Data	Description	Notes
a	(	Start byte	
b	HH.H	Freq high loss point	H is an Integer number 0 to 9. The unit is Hz.
c	LL.L	Freq low loss point	L is an Integer number 0 to 9. The unit is Hz.

The bypass frequency rang from 40.0 to 49.0, default 46.0Hz, the precision is 0.1Hz.

#### 4.23 QPAR<cr>: UPS parallel number inquiry

Computer: QPAR<cr>

UPS: (nn<cr> nn=01.....99

改为 UPS: (nn mm<cr>

nn is the parallel number.

#### 4.24 QFLAG<cr>: Setting flag status inquiry

Computer: QFLAG<cr>

UPS: (ExxxDxxx <cr>

ExxxDxxx is the flag status. E means enable, D means disable

x	Control setting
a	Enable/disable audible alarm
b	Enable/disable battery mode audible warning

Case Name:		Date:		Num:	
Case Num:		Version:		PAGE	36/68

<b>c</b>	Enable/disable code start
<b>d</b>	Enable/disable battery open status check
<b>e</b>	Enable/disable high efficiency mode
<b>f</b>	Enable/disable bypass forbidding
<b>g</b>	Enable/disable energy saving
<b>h</b>	Enable/disable short restart 3 times
<b>i</b>	Enable/disable inverter short clear function
<b>j</b>	Enable/disable Output socket1 when the delay release time is over in battery mode .
<b>k</b>	Enable/disable Output socket2 when the delay release time is over in battery mode.
<b>l</b>	Enable/disable Site fault detect
<b>m</b>	Set hot standby master/slave, PEM means master, PDM means slave
<b>n</b>	Enable/disable deep high efficiency mode
<b>o</b>	Enable/disable bypass when UPS turn off.
<b>p</b>	Enable/disable bypass audible warning
<b>q</b>	Enable/disable Constant Phase Angle function
<b>r</b>	Enable/disable auto-Restart.
<b>s</b>	Enable/disable battery deep discharge protect
<b>t</b>	Enable/disable battery low protect (if disable, the battery will discharge to 6V)
<b>u</b>	Enable/disable Free run function
<b>v</b>	Enable/disable converter mode
<b>w</b>	Enable/disable limited runtime on battery mode
<b>x</b>	Enable/disable output parallel function in phase angle 0
<b>y</b>	Enable/disable phase auto adapt
<b>z</b>	Enable/disable period self test

#### 4.25 **QVFW<cr> : Main CPU Firmware version inquiry**

Computer: QVFW<cr>

UPS: (VERFW: <m>.<n><cr>

<m> are 5 characters, represent firmware series number;

Case Name:		Date:		Num:	
Case Num:		Version:		PAGE	37/68

<n> can be 2~4 characters, represent version;

Example:

Computer: QVFW<cr>

UPS: (VERFW: 00123.01<cr>

00123: firmware series number;

01: version.

Computer: QVFW<cr>

UPS: (VERFW: 00123.01s1<cr>

00123: firmware series number;

01s1: version.

#### 4.26 **QVFW2<cr> :the second CPU Firmware version inquiry**

Computer: QVFW2<cr>

UPS: (VERFW2: <m>.<n><cr>

<m> are 5 characters, represent firmware series number;

<n> can be 2~4 characters, represent version;

Example:

Computer: QVFW2<cr>

UPS: (VERFW2: 00234.01<cr>

00234: firmware series number;

01: version.

Computer: QVFW2<cr>

UPS: (VERFW2: 00234.01s1<cr>

00234: firmware series number;

01s1: version.

#### 4.27 **-QVFW3<cr> :the third CPU Firmware version inquiry(for 3-3 10~20K)**

Computer: QVFW3<cr>

UPS: (VERFW3: <m>.<n><cr>

<m> are 5 characters, represent firmware series number;

<n> can be 2~4 characters, represent version;

Example:

Computer: QVFW3<cr>

Case Name:		Date:		Num:	
Case Num:		Version:		PAGE	38/68

UPS: (VERFW3: 00345.01<cr>  
00345: firmware series number;  
01: version.

Computer: QVFW3<cr>  
UPS: (VERFW3: 00345.01s1<cr>  
00345: firmware series number;  
01s1: version.

#### 4.28 -QVER<cr> : Main CPU Firmware version inquiry---for taurus

Computer: QVER<cr>  
UPS: (VER: Ver. <n.m> X - Ver. <p.q> Y <cr>  
<n.m><p.q>,n m p q is a number from 0...9.  
X Y is a character from A to Z.

Example:

Computer: QVER<cr>  
UPS: (VER: Ver. 2.6 W - Ver. 3.4 W <cr>

#### 4.29 QID<cr>: The UPS ID inquiry

Computer: QID<cr>  
UPS: (ABCDEEFFGXXXXX<cr>

	Data	Description	Notes
a	(	Start byte	
b	A	Main Production type	8: UPS,9: NONE UPS
c	B	Sub Production type	
d	C	VA type	
e	D	H/LV type	
f	EE	Year	
g	FF	Month	
h	G	Manufacturer ID	
i	XXXXX	Serial number	

Example:

Computer: QID<cr>

Case Name:		Date:		Num:	
Case Num:		Version:		PAGE	39/68

UPS: (83320903100001<cr>

#### 4.30 QBV<cr>: The P battery information inquiry

Computer: QBV<cr>

UPS: (RRR.R NN MM CCC TTT<cr>

	Data	Description	Notes
a	(	Start byte	
b	RRR.R	Battery voltage	R is an Integer number 0 to 9. The units is V.
c	NN	Battery piece number	NN is from 01 to 20.
d	MM	Battery group number	MM is an Integer number 01 to 99.
e	CCC	Battery capacity	CCC is an Integer number 000 to 100.
f	TTT	Battery remain time	T is an Integer number 0 to 9. The units is minutes.

#### 4.31 QNBV<cr>: The N battery information inquiry

Computer: QNBV<cr>

UPS: (RRR.R NN MM CCC TTT<cr>

	Data	Description	Notes
a	(	Start byte	
b	RRR.R	Battery voltage	R is an Integer number 0 to 9. The units is V.
c	NN	Battery piece number	NN is from 01 to 20.
d	MM	Battery group number	MM is an Integer number 01 to 99.
e	CCC	Battery capacity	CCC is an Integer number 000 to 100.
f	TTT	Battery remain time	T is an Integer number 0 to 9. The units is minutes.

#### 4.32 QLDEL<cr>: Load level inquiry

Computer: QLDEL<cr>

UPS: (XXX YYY<cr>

	Data	Description	Notes
a	(	Start byte	
b	XXX	Watt percent	X is an Integer number 0 to 9. The unit is %.
c	YYY	VA percent	Y is an Integer number 0 to 9. The unit is %.

#### 4.33 QHE<cr>: High efficiency mode voltage range inquiry

Computer: QHE<cr>

UPS: (HHH LLL <cr>

Case Name:		Date:		Num:	
Case Num:		Version:		PAGE	40/68

	Data	Description	Notes
a	(	Start byte	
b	HHH	Voltage high loss point	H is an Integer number 0 to 9. The unit is voltage.
c	LLL	Voltage low loss point	L is an Integer number 0 to 9. The unit is voltage.

#### 4.34 -QFRE<cr>: Free run mode frequency range inquiry

Computer: QFRE<cr>

UPS: (HH.H LL.L <cr>

	Data	Description	Notes
a	(	Start byte	
b	HH.H	Voltage high loss point	H is an Integer number 0 to 9. The unit is Hz.
c	LL.L	Voltage low loss point	L is an Integer number 0 to 9. The unit is Hz.

#### 4.35 QSK<n><cr>: Output socket status inquiry

Computer: QSK<n><cr>

<n> is "1" or "2", "1" is refer to output socket1, "2" is refer to output socket2.

UPS: (N<cr>.

The "N" is "0" or "1", if "N" is "0", the output socket status is OFF; if "N" is "1", the output socket status is ON.

#### 4.36 QSKT<n><cr>: Output socket release delay time inquiry in battery mode

Computer: QSKT<n><cr>

<n> is "1" or "2", "1" is refer to output socket1, "2" is refer to output socket2.

UPS: (NNN<cr>.

The "NNN" is from "000" to "999", unit is minute.

=====UPS inner command=====

#### 4.37 -QBDR<cr>: The baud rate inquiry

Computer: QBDR<cr>

UPS: (NN<cr>

NN is 24, 48, and 96. It means that the baud rate is 2400, 4800 and 9600.

#### 4.38 QTPR<cr>: The temperature inquiry

Computer: QTPR<cr>



Case Name:		Date:		Num:	
Case Num:		Version:		PAGE	41/68

UPS: (RRR.R SSS.S HHH.H LLL.L<cr>

	Data	Description	Notes
a	(	Start byte	
b	RRR.R	temperature1	R is an Integer number 0 to 9. The units is °C.
c	SSS.S	temperature2	S is an Integer number 0 to 9. The units is °C.
d	HHH.H	temperature3	H is an Integer number 0 to 9. The units is °C.
e	LLL.L	temperature4	L is an Integer number 0 to 9. The units is °C.

For example:

Computer: QTPR<cr>

UPS: (032.0 032.4 ---.- ---.- <cr>

Means:

The first temperature check point is 32.0°C;

The second temperature check point is 32.4°C;

There is no the third and the fourth temperature check points

#### 4.39 -Q5<cr>: Firmware current version release time inquiry

Computer: Q5<cr>

UPS: (yyyymmdd<cr>

For example:

Computer: Q5<cr>

UPS: (20081009<cr>

Means: the Firmware current version release time is 2008-10-09

#### 4.40 QCHGC<cr>: Setting Charging current inquiry

Computer: QCHGC<cr>

UPS: (CHGC<nn><cr> nn is from 00 to 60

#### 4.41 -QBUS<cr>: bus voltage setting value inquiry

Computer: QBUS<cr>

UPS: (BUS 330/345/360 <cr>

Example:

Computer: QBUS<cr>

UPS: (BUS345<cr>

Means: The BUS voltage is 345V.

Case Name:		Date:		Num:	
Case Num:		Version:		PAGE	42/68

**4.42 -QBUSP<cr>: Positive bus voltage fine-turning value inquiry**

Computer: QBUSP<cr>

UPS: (BUSP +<n> <cr> or (BUSP -<n> <cr>

**4.43 -QBUSN<cr> : Negative bus voltage fine-turning value inquiry**

Computer: QBUSN<cr>

UPS: (BUSN +<n> <cr> or (BUSN -<n> <cr>

**4.44 -QVB<cr>: Battery sampling voltage fine-turning value inquiry**

Computer: QVB<cr>

UPS: (VBS+<n><cr> or VBS- <n><cr>

n is an integer number ranging from 00 to 19.

**4.45 -QV<cr>: Output voltage setting value inquiry**

Computer: QV<cr>

UPS: (V208/220/230/240<cr>

**4.46 -QVC<cr>: Output voltage fine-turning value inquiry**

Computer: QVC<cr>

UPS: (V ± n<cr> n=0.....6

**4.47 -QVLINE<cr>: The line sampling voltage fine-turning value inquiry**

Computer: QVLINE<cr>

UPS: (VLINE ± <n><cr> n is from 0 to 6

**4.48 -QVBYP<cr>: The bypass sampling voltage fine-turning value inquiry**

Computer: QVBYP<cr>

UPS: (VBYP ± <n><cr> n is from 0 to 6

**4.49 -QMAXW<cr>: Current maximum watt inquiry**

Computer: QMAXW<cr>

UPS: (nnn <cr>

nnn is from 000 to 100

Case Name:		Date:		Num:	
Case Num:		Version:		PAGE	43/68

#### 4.50 -QMXVA<cr>: Current maximum VA inquiry

Computer: QMXVA<cr>  
UPS: (nnn <cr>  
nnn is from 000 to 100

#### 4.51 QPD<cr>: inquiry input phase angle and output phase angle

Computer: QPD<cr>  
UPS: (nnn mmm<cr>  
nnn means input phase angle and mmm means output phase angle.  
nnn and mmm will be 000, 120, 180 and 240.

#### 4.52 QBCO<cr>: inquiry battery cut-off voltage and battery low voltage

Computer: QBCO<cr>  
UPS: (A.AA BB.BB CC.CC<cr>  
A.AA: Battery Cut-off minimum voltage per cell,  
BB.BB: Cut off voltage per PCS,  
CC.CC: Battery low voltage per PCS.

#### 4.53 -QIPT<cr>: inquiry acceptable input line type(For line-Interactive UPS)

Computer: QIPT<cr>  
UPS: (IP<T><cr>: T is N/W/G  
T is the acceptable input line type code, the code can be N: Normal input, W: wide range input,  
G: Generator input.

#### 4.54 -QNL<cr>: inquiry Neutral loss check setting (for 2-2 6~10K, 3-1 3-3 10~20K)

Computer: QNL<cr>  
UPS: (NL<nnn><cr>:  
<nnn> is three characters which can be ATO, CHE, DIS.  
ATO means the UPS will automatically detect the neutral loss or not. And automatically clear the neutral loss alarm if the neutral is restored;  
CHE means the UPS will automatically detect the neutral loss. But if the neutral loss alarm is triggered, the UPS will not automatically clear the neutral loss alarm and go back to normal mode even if neutral is restored. That means the user must clear the neutral loss alarm and make the UPS go back to normal mode by sending this option.

Case Name:		Date:		Num:	
Case Num:		Version:		PAGE	44/68

DIS means the UPS will not detect the neutral loss or not.

Example:

Computer: QNL<cr>

UPS: (NLCHE<cr>

#### **4.55 -QBAT<cr>: inquiry battery parameter(for combo6~10K)**

Computer: QBAT<cr>

UPS: (BATxx yy zzz r.r<cr>

xx is bat numer per string; yy is number of strings;zzz is bat capacity(AH)

r.r is bat cap adjusting factor. Calibrate the displayed backup time by adjusting this multiplier factor. The displayed backup time will be equal with the original calculated backup time multiply this value. The default value is 1.0, and the range is from 0.5 to 2.

#### **4.56 QTV<n><cr>: Inquiry set test volt (for combo6~10K Rack Li)**

Computer: QTV<cr>

UPS: (TV<n>,<n> is a number ranging from 240~280.

#### **4.57 QVSOC<cr>: Inquiry voltage of start over charge (for combo6~10K Rack Li)**

Computer: QVSOC<cr>

UPS: (VSOC<nnn>,<n> is number range from 130~143 means battery 13V~14.3V/cell

#### **4.58 QBTAH<cr>: The battery Total AH information Inquiry**

Computer: QBTAH<cr>

Device: (RRR NNNN<cr>

RRR = Three ASCII digits indicating Rating AH, the range is from 001~999, unit: AH

NNNN = four ASCII digits indicating Total AH, the range is from 0001~9999, unit: AH

#### **4.59 QPST<cr>: The Period of period Self test Inquiry**

Computer: QPST<cr>

Device: (PP<cr>

PP = two ASCII digits indicating the period of period self test, the range is from 00~99, unit: day,

Note:

00: disable period self test



Case Name:		Date:		Num:	
Case Num:		Version:		PAGE	46/68

CCCC = four ASCII digits indicating discharging start hour and minute  
 DDDD = four ASCII digits indicating discharging end hour and minute

#### 4.63 **-QDWH<cr>: Discharging Watt-hour Inquiry**

Computer: QDWH<cr>

DEVICE: (DDDDDDDD<cr>

DDDDDDDD = eight ASCII digits indicating discharging Watt-hour in battery mode

## 5 Control Command

### 5.1 **T<cr>: 10 seconds test ----Special for off-line.**

Computer: T<cr>

UPS: None response.

Means: Test for 10 seconds and then return to utility.

- (1) If battery low occurs during testing, UPS will return to utility immediately.
- (2) Only when UPS is in line mode, and the battery voltage is not less than 13V/pcs, the command is executed.

### 5.2 **T<cr>: 10 seconds test**

Computer: T<cr>

UPS: (ACK<cr> if UPS accepts this command, otherwise, responds (NAK<cr>

Means: Test for 10 seconds and then return to utility.

- (1) If battery low occurs during testing, UPS will return to utility immediately.
- (2) Only when UPS is in line mode, and the battery voltage is not less than 13V/pcs, the command is executed.

### 5.3 **TL<cr>: Test until battery low**

Computer: TL<cr>

UPS: (ACK<cr> if UPS accepts this command, otherwise, responds (NAK<cr>

Means: Test until battery low and then return to utility.

This command is used to let the user to discharge the battery by setting the time to test, that is to say that the user should discharge the battery by periods, with this command the ups will do it by itself.

Case Name:		Date:		Num:	
Case Num:		Version:		PAGE	47/68

#### 5.4 T<n><cr>: Test for specified time

Computer: T<n><cr>

UPS: (ACK<cr> if UPS accepts this command, otherwise, responds (NAK<cr>  
<n> is a number ranging from .2, .3, ..., 01, 02, ..., to 99.

Means: Test for <n> minutes

#### 5.5 S<n><cr>: Shutdown

Computer: S<n><cr>

UPS: (ACK<cr> if UPS accepts this command, otherwise, responds (NAK<cr>

Means: 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 .2, .3, ..., 01, 02, ..., to 10.

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

#### 5.6 S<n>R<m><cr>: Shutdown and restore ----Special for off-line

Computer: S<n>R<m><cr>

UPS: None response

Means: Cut UPS output off in <n> minutes and waiting for <m> minutes and 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 waiting shutdown 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 .2, .3, ..., 01, 02, ..., to 99.

<m> is a number ranging from 0000 to 9999. If it is 0000, there will be no restore, and if control power could be shut off, then turn off it immediately.

#### 5.7 S<n>R<m><cr>: Shutdown and restore

Computer: S<n>R<m><cr>

UPS: (ACK<cr> if UPS accepts this command, otherwise, responds (NAK<cr>

Case Name:		Date:		Num:	
Case Num:		Version:		PAGE	48/68

Means: Cut UPS output off in <n> minutes and waiting for <m> minutes and 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 waiting shutdown 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 .2, .3, ..., 01, 02, ..., to 99.

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

### 5.8 CS<cr>: Cancel shutdown

Computer: CS<cr>

UPS: (ACK<cr> if UPS accepts this command, otherwise, responds (NAK<cr>

Means: Cancel the S<n><cr> and S<n>R<m><cr> **and SON** command.

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

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

### 5.9 C<cr>: Cancel shutdown----Special for off-line

Computer: C<cr>

UPS: None

Function: Cancel the S<n>R<m><cr> command.

Note:

UPS only accepts this command when the SnRm command has not been complete.

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).

### 5.10 CT<cr>: Cancel test

Computer: CT<cr>

UPS: (ACK<cr> if UPS accepts this command, otherwise, responds (NAK<cr>

Means: Cancel all test activity and connect the utility to output immediately.

### 5.11 SON<cr>: Remote turn on UPS

Computer: SON<cr>



Case Name:		Date:		Num:	
Case Num:		Version:		PAGE	49/68

UPS: (ACK<cr> if UPS accepts this command, otherwise, responds (NAK<cr>  
Means: Remote turn on UPS.

### 5.12 SOFF<cr>: Remote turn off UPS

Computer: SOFF<cr>

UPS: (ACK<cr> if UPS accepts this command, otherwise, responds (NAK<cr>

Means: Remote turn off UPS.

### 5.13 BZOFF<cr>: Silence buzzer beep

Computer: BZOFF <cr>

UPS: (ACK<cr> if UPS accepts this command, otherwise, responds (NAK<cr>

Means: The buzzer beep silence .

### 5.14 BZON<cr>: buzzer beep open

Computer: BZON <cr>

UPS: (ACK<cr> if UPS accepts this command, otherwise, responds (NAK<cr>

Means: The buzzer beep open

### 5.15 Q<cr>: Toggle beep ----Special for off-line

PC sends to UPS: Q<cr>

Response from UPS: None.

Function: Toggle the UPS beep

Note:

When the AC power failed, UPS will generate a warning beep to inform the manager. Manager could toggle the warning beep by sending this command

### 5.16 SKON<n><cr>: Remote turn on UPS output socket

Computer: SKON<n><cr>

UPS: (ACK<cr> if UPS accepts this command, otherwise, responds (NAK<cr>

Means: Remote turn on UPS output socket.

<n> is "1" or "2", "1" is refer to output socket1, "2" is refer to output socket2,

### 5.17 SKOFF<n><cr>: Remote turn off UPS output socket

Computer: SKOFF<n><cr>

UPS: (ACK<cr> if UPS accepts this command, otherwise, responds (NAK<cr>

Case Name:		Date:		Num:	
Case Num:		Version:		PAGE	50/68

Means: Remote turn off UPS output socket.

<n> is “1”or “2”, “1”“is refer to output socket1, “2” is refer to output socket2,

=====UPS Inner Command=====

### 5.18 -BZDT<cr>: Toggle beep

Computer: BZDT<cr>

UPS: (ACK<cr> if UPS accepts this command, otherwise, responds (NAK<cr>

Means: Toggle the UPS beep.

The command can disable beep of any warning or fault for debug or mass eliminating buzzer noise.

### 5.19 -CLRPP<cr>: Clear parallel protect flag(for 1-1 6-10K)

Computer: CLRPP<cr>

UPS: (ACK<cr> if UPS accepts this command, otherwise, responds (NAK<cr>

### 5.20 TV<n><cr>:BatTest until bat vol lower than <n>(for combo6-10)

Computer: TV<n><cr> or TV<cr>

UPS: (ACK<cr> if UPS accepts this command, otherwise, responds (NAK<cr>

<n> is a number ranging from 240~280,255 is default value.

Means: Test to <n> volt

## 6 Setting parameters Command

### 6.1 PE<XXX>/PD<XXX><cr>: setting some status enable/disable

Computer: PE<XXX>/PD<XXX><cr>

UPS: (ACK<cr> if UPS accepts this command, otherwise, responds (NAK<cr>

Case Name:		Date:		Num:	
Case Num:		Version:		PAGE	51/68

<b>X</b>	<b>Control setting</b>
<b>A</b>	Enable/disable audible alarm
<b>B</b>	Enable/disable battery mode audible warning
<b>C</b>	Enable/disable code start
<b>D</b>	Enable/disable battery open status check
<b>E</b>	Enable/disable high efficiency mode
<b>F</b>	Enable/disable bypass forbidding
<b>G</b>	Enable/disable energy saving
<b>H</b>	Enable/disable short restart 3 times
<b>I</b>	Enable/disable inverter short clear function
<b>J</b>	Enable/disable “Output socket1 when the delay release time is over in battery mode” .
<b>K</b>	Enable/disable “Output socket2 when the delay release time is over in battery mode” .
<b>L</b>	Enable/disable Site fault detect
<b>M</b>	Set hot standby master/slave, PEM means master, PDM means slave
<b>N</b>	Enable/disable deep high efficiency mode
<b>O</b>	Enable/disable bypass when UPS turn off.
<b>P</b>	Enable/disable bypass audible warning
<b>Q</b>	Enable/disable Constant Phase Angle function
<b>R</b>	Enable/disable auto-reboot.
<b>S</b>	Enable/disable battery deep discharge protect
<b>T</b>	Enable/disable battery low protect (if disable, the battery will discharge to 6V)
<b>U</b>	Enable/disable Free run function
<b>V</b>	Enable/disable converter mode
<b>W</b>	Enable/disable limited runtime on battery mode
<b>X</b>	Enable/disable output parallel function in phase angle 0
<b>Y</b>	Enable/disable phase auto adapt
<b>Z</b>	Enable/disable period self test

Case Name:		Date:		Num:	
Case Num:		Version:		PAGE	52/68

## 6.2 PSK<n><m><cr>: Set output socket release delay time in battery mode

Computer: PSK<n><m><cr>

UPS: (ACK<cr> if UPS accepts this command, otherwise, responds (NAK<cr>

<n> is “1”or “2”, “1”is refer to output socket1, “2” is refer to output socket2,.

<m> is the output socket release delay time in battery mode, it’s from“000”to “999”,unit is minute.

## 6.3 PSF<m><cr>: Set bypass frequency loss loss point

Computer: PSF<m><cr>

UPS: (ACK<cr> if UPS accepts this command, otherwise, responds (NAK<cr>

In 50Hz system, <m> is a number ranging from 40.0 to 49.0, default 46.0Hz; in 60Hz system, <m> is a number ranging from 50.0 to 59.0, default 56.0Hz; the precision is 0.1Hz;

Computer: PSF42.1<cr>

UPS: (ACK<cr>

Means: The bypass frequency low loss point has been set to 42.1Hz

## 6.4 PGF<n><cr>: Set bypass frequency high loss point

Computer: PGF<n><cr>

UPS: (ACK<cr> if UPS accepts this command, otherwise, responds (NAK<cr>

In 50Hz system, <n> is a number ranging from 51.0 to 60.0, default 54.0Hz; in 60Hz system, <n> is a number ranging from 61.0 to 70.0; the precision is 0.1Hz.

Computer: PGF54.6<cr>

UPS: (ACK<cr>

Means: The bypass frequency high loss point has been set to 54.6Hz.

## 6.5 PLV<p><cr>: Set bypass voltage low loss point

Computer: PLV<p><cr>

UPS: (ACK<cr> if UPS accepts this command, otherwise, responds (NAK<cr>

<p> is a number ranging from 176 to 264, default 176V. The precision is 1 volt.

For example:

Computer: PLV<p><cr>

UPS: (ACK<cr>

Means: Set the bypass voltage low loss point to 185V.

Case Name:		Date:		Num:	
Case Num:		Version:		PAGE	53/68

### 6.6 PHV<q><cr>: Set bypass voltage high loss point

Computer: PHV<q><cr>

UPS: (ACK<cr> if UPS accepts this command, otherwise, responds (NAK<cr> <q> is a number ranging from 176 to 276, default 276V. The precision is 1 volt.

For example:

Computer: PHV<q><cr>

UPS: (ACK<cr>

Means:Set the bypass voltage low loss point to 260V

### 6.7 PF<cr>: Setting control parameter to default value

Computer: PF<cr>

UPS: (ACK<cr> if UPS accepts this command, otherwise, responds (NAK<cr>

All UPS parameters set to default value.

- (a) Setting bypass frequency low loss point to 46.0Hz.
- (b) Setting bypass frequency high loss point to 54.0Hz.
- (c) Setting bypass voltage low loss point to 176V.
- (d) Setting bypass voltage high loss point to 264V.

<b>X</b>	<b>Control setting</b>
<b>a</b>	Enable/disable audible alarm
<b>b</b>	Enable/disable battery mode audible warning
<b>c</b>	Enable/disable code start
<b>d</b>	Enable/disable battery open status check
<b>e</b>	Enable/disable high efficiency mode
<b>f</b>	Enable/disable bypass forbidding
<b>g</b>	Enable/disable energy saving
<b>h</b>	Enable/disable short restart 3 times
<b>i</b>	Enable/disable inverter short clear function
<b>j</b>	Enable/disable "Output socket1 when the delay release time is over in battery mode" .
<b>k</b>	Enable/disable "Output socket2 when the delay release time is over in battery mode".
<b>l</b>	Enable/disable Site fault detect

Case Name:		Date:		Num:	
Case Num:		Version:		PAGE	54/68

<b>m</b>	Set hot standby master/slave, PEM means master, PDM means slave
<b>n</b>	Enable/disable deep high efficiency mode
<b>o</b>	Enable/disable bypass when UPS turn off.
<b>p</b>	Enable/disable bypass audible warning
<b>q</b>	Enable/disable Constant Phase Angle function
<b>r</b>	Enable/disable auto-reboot.
<b>s</b>	Enable/disable battery deep discharge protect
<b>t</b>	Enable/disable battery low protect (if disable, the battery will discharge to 6V)
<b>u</b>	Enable/disable Free run function
<b>v</b>	Enable/disable converter mode
<b>w</b>	Enable/disable limited runtime on battery mode
<b>x</b>	Enable/disable output parallel function in phase angle 0
<b>y</b>	Enable/disable phase auto adapt
<b>z</b>	Enable/disable period self test

Notes: 1 is enable, 0 is disable.

### 6.8 PPD<nnn><cr>: Set output phase angle

Computer: PPD <nnn><cr>

UPS: (ACK<cr> if UPS accepts this command, otherwise, responds (NAK<cr>  
nnn can be 000, 120, 180 or 240.

### 6.9 BATN<nn><cr>: Setting battery piece number

Computer: BATN <nn><cr>

UPS: (ACK<cr> if UPS accepts this command, otherwise, responds (NAK<cr>  
nn is from 01 to 20.

### 6.10 BATGN<nn><cr>: Setting battery group number

Computer: BATGN <nn><cr>

UPS: (ACK<cr> if UPS accepts this command, otherwise, responds (NAK<cr>  
nn is from 01 to 99

Case Name:		Date:		Num:	
Case Num:		Version:		PAGE	55/68

**6.11 HEH<nnn><cr>: Set high efficiency mode voltage high loss point**

Computer: HEH <nnn><cr>

UPS: (ACK<cr> if UPS accepts this command, otherwise, responds (NAK<cr> nnn is form 001 to 300. The units is V.

**6.12 HEL<nnn><cr>: Set high efficiency mode voltage low loss point**

Computer: HEL<nnn><cr>

UPS: (ACK<cr> if UPS accepts this command, otherwise, responds (NAK<cr> nnn is form 001 to 300. The units is V.

**6.13 FREH<nnn><cr>: Set free run mode frequency high loss point**

Computer: FREH<nnn><cr>

UPS: (ACK<cr> if UPS accepts this command, otherwise, responds (NAK<cr> nnn is form 400 to 700. The units is 0.1Hz.

**6.14 -HEFH<nn><cr>: Set high efficiency mode Frequency high loss point (For 10-20K)**

Computer: HEH <nn><cr>

UPS: (ACK<cr> if UPS accepts this command, otherwise, responds (NAK<cr> nn is form 52-54(62-64). The units is Hz.

**6.15 -HEFL<nn><cr>: Set high efficiency mode Frequency low loss point (For 10-20K)**

Computer: HEL<nn><cr>

UPS: (ACK<cr> if UPS accepts this command, otherwise, responds (NAK<cr> nn is form 46-48(56-58). The units is Hz.

**6.16 FREL<nnn><cr>: Set free run mode frequency low loss point**

Computer: FREL <nnn><cr>

UPS: (ACK<cr> if UPS accepts this command, otherwise, responds (NAK<cr> nnn is form 400 to 700. The units is 0.1Hz.

Case Name:		Date:		Num:	
Case Num:		Version:		PAGE	56/68

=====UPS Inner Command=====

### 6.17 -BDR<nn><cr>: Setting SCI baud rate

Computer: BDR <nn><cr>

UPS: (ACK<cr> if UPS accepts this command, otherwise, responds (NAK<cr>

nn=24, 48, 96

Example:

Computer: BDR24<cr>

UPS: (ACK<cr>

means: the system baud rate is set to 2400.

### 6.18 -ID< ABCDEEFFGXXXXX ><cr>: Setting UPS ID

Computer: ID< ABCDEEFFGXXXXX ><cr>

UPS: (ACK<cr> if UPS accepts this command, otherwise, responds (NAK<cr>

	Data	Description	Notes
a	(	Start byte	
b	A	Main Production type	8: UPS,9: NONE UPS
c	B	Sub Production type	
d	C	VA type	
e	D	H/LV type	
f	EE	Year	
g	FF	Month	
h	G	Manufacturer ID	
i	XXXXX	Serial number	

For example:

Computer: ID83320903100001<cr>

UPS: (ACK<cr>

### 6.19 -RESET<cr>: Setting UPS output voltage and BUS voltage to default value

Computer: RESET <cr>

UPS: (ACK<cr> if UPS accepts this command, otherwise, responds (NAK<cr>

The UPS will be set default output.

For example: Output voltage will be set 220V, and the BUS voltage will be set 345V.



Case Name:		Date:		Num:	
Case Num:		Version:		PAGE	57/68

### 6.20 -REEP<cr>: Setting EEPROM to default except UPS ID

Computer: REEP <cr>

UPS: (ACK<cr> if UPS accepts this command, otherwise, responds (NAK<cr>

After the UPS receive the command, reboot the ups, the eeprom will be set default except UPS ID.

### 6.21 -V<n><cr>: Setting output rating voltage

Computer: V<n><cr>

UPS: (ACK<cr> if UPS accepts this command, otherwise, responds (NAK<cr>

Output Voltage: <n>. n is 208,220,230,240.

Default status: Output nominal voltage 220V. (It can be set only in bypass mode)

For example:

Computer: V230<cr>

UPS: (ACK<cr>

Means: set output nominal voltage to 230V.

### 6.22 -BUS<n><cr>: Setting BUS rating voltage

Computer: BUS<n><cr>

UPS: (ACK<cr> if UPS accepts this command, otherwise, responds (NAK<cr>

n is 330, 345, 360.

For example:

Computer: BUS360<cr>

UPS: (ACK<cr>

Means: set BUS nominal voltage to 360V

### 6.23 -F50<cr>: Setting UPS output rating frequency to 50Hz

Computer: F50<cr>

UPS: (ACK<cr> if UPS accepts this command, otherwise, responds (NAK<cr>

Set UPS output rating frequency to 50Hz. (Only in bypass mode)

### 6.24 -F60<cr>: Setting UPS output rating frequency to 60Hz

Computer: F60<cr>

UPS: (ACK<cr> if UPS accepts this command, otherwise, responds (NAK<cr>

Set UPS output nominal frequency to 60Hz. (Only in bypass mode)

Case Name:		Date:		Num:	
Case Num:		Version:		PAGE	58/68

### 6.25 CHGC<nn><cr>: Setting charging current of the charger

Computer: CHGC <nn><cr>

UPS: (ACK<cr> if UPS accepts this command, otherwise, responds (NAK<cr>  
nn is form 01 to 60.

### 6.26 -MAXW<nnn><cr>: Setting maximum watt value

Computer: MAXW<nnn><cr>

UPS: (ACK<cr> if UPS accepts this command, otherwise, responds (NAK<cr>  
nnn is form 001 to 100.

This command is to change the full load parameter. The parameter is bigger, that is to say the system can load more line load. The default value is 70, and the default PF is 0.7.

### 6.27 -MXVA<nnn><cr>: Setting maximum VA value

Computer: MAXVA<nnn><cr>

UPS: (ACK<cr> if UPS accepts this command, otherwise, responds (NAK<cr>  
nnn is form 001 to 100.

This command is to change the full load parameter. The parameter is bigger, that is to say the system can load more nonlinear load. The default value is 100.

### 6.28 -V±<n> <cr>: Fine-turning output voltage

Computer: V+<n> <cr> n= 0, 1....., 6

Computer: V-<n> <cr> n= 0, 1....., 6

UPS: (ACK<cr> if UPS accepts this command, otherwise, responds (NAK<cr>

Example:

Computer: V+1<cr>

UPS: (ACK<cr>

Means: Output voltage will increase about 1 Volt.

### 6.29 -VLINE±<n> <cr>: Fine-turning line voltage sampling value

Computer: VLINE+<n><cr> n= 0, 1....., 6

UPS: (ACK<cr> if UPS accepts this command, otherwise, responds (NAK<cr>

Computer: VLINE-<n><cr> n= 0, 1....., 6

UPS: (ACK<cr> if UPS accepts this command, otherwise, responds (NAK<cr>

Case Name:		Date:		Num:	
Case Num:		Version:		PAGE	59/68

**6.30 -VBYP±<n><cr>: Fine-tuning bypass voltage sampling value(for 1-1 6~10K)**

Computer: VBYP+<n><cr> n= 0, 1....., 6

UPS: (ACK<cr> if UPS accepts this command, otherwise, responds (NAK<cr>

Computer: VBYP-<n><cr> n= 0, 1....., 6

UPS: (ACK<cr> if UPS accepts this command, otherwise, responds (NAK<cr>

**6.31 -BUSP±<n><cr>: Fine-tuning positive bus voltage**

Computer: BUSP+<n><cr>

UPS: (ACK<cr> if UPS accepts this command, otherwise, responds (NAK<cr>

Computer: BUSP -<n><cr>

UPS: (ACK<cr> if UPS accepts this command, otherwise, responds (NAK<cr>

<n> is a number which ranging from 00, 01..... to 19.

**6.32 -BUSN±<n><cr>: Fine-tuning negative bus voltage**

Computer: BUSN+<n><cr>

UPS: (ACK<cr> if UPS accepts this command, otherwise, responds (NAK<cr>

Computer: BUSN -<n><cr>

UPS: (ACK<cr> if UPS accepts this command, otherwise, responds (NAK<cr>

<n> is a number which ranging from 00, 01..... to 19.

**6.33 -VB±<n><cr>: Fine-tuning battery voltage sampling value**

Computer: VB+<n><cr>

UPS: (ACK<cr> if UPS accepts this command, otherwise, responds (NAK<cr>

Computer: VB-<n><cr>

UPS: (ACK<cr> if UPS accepts this command, otherwise, responds (NAK<cr>

<n> is a number which ranging from 00, 01..... to 19.

**6.34 -V±<nn><cr>: Fine-tuning inverter R voltage (for 2-2 6~10K, 3-1 3-3 10~20K)**

Computer: V+<nn><cr> nn= 00, 01....., 99

Computer: V-<nn><cr> nn= 00, 01....., 99

UPS: (ACK<cr> if UPS accepts this command, otherwise, responds (NAK<cr>

Example:

Computer: V+56<cr>

Case Name:		Date:		Num:	
Case Num:		Version:		PAGE	60/68

UPS: (ACK<cr>

Means: Output R voltage will increase about 5.6 Volt.

**6.35 -VS±<nn> <cr>: Fine-turning inverter S voltage (for 2-2 6~10K, 3-3 10~20K)**

Computer: VS+<nn> <cr> nn= 00, 01....., 99

Computer: VS-<nn> <cr> nn= 00, 01....., 99

UPS: (ACK<cr> if UPS accepts this command, otherwise, responds (NAK<cr>

Example:

Computer: VS+56<cr>

UPS: (ACK<cr>

Means: Output S voltage will increase about 5.6 Volt.

**6.36 -VT±<nn> <cr>: Fine-turning inverter T voltage (for 3-3 10~20K)**

Computer: VT+<nn> <cr> nn= 00, 01....., 99

Computer: VT-<nn> <cr> nn= 00, 01....., 99

UPS: (ACK<cr> if UPS accepts this command, otherwise, responds (NAK<cr>

Example:

Computer: VT+56<cr>

UPS: (ACK<cr>

Means: Output T voltage will increase about 5.6 Volt.

**6.37 -VLINE±<nn> <cr>: Fine-turning Line\_R voltage sampling value (for 2-2 6~10K, 3-1 3-3 10~20K)**

Computer: VLINE+<nn><cr> nn= 00, 01....., 99

UPS: (ACK<cr> if UPS accepts this command, otherwise, responds (NAK<cr>

Computer: VLINE-<nn><cr> nn= 00, 01....., 99

UPS: (ACK<cr> if UPS accepts this command, otherwise, responds (NAK<cr>

**6.38 -VLINEB±<nn> <cr>: Fine-turning Line\_S voltage sampling value (for 2-2 6~10K, 3-1 3-3 10~20K)**

Computer: VLINEB+<nn><cr> nn= 00, 01....., 99

UPS: (ACK<cr> if UPS accepts this command, otherwise, responds (NAK<cr>

Computer: VLINEB-<nn><cr> nn= 00, 01....., 99

UPS: (ACK<cr> if UPS accepts this command, otherwise, responds (NAK<cr>

Case Name:		Date:		Num:	
Case Num:		Version:		PAGE	61/68

**6.39 -VLINEC±<nn> <cr>: Fine-turning Line\_T voltage sampling value (for 3-1 3-3 10~20K)**

Computer: VLINEC+<nn><cr> nn= 00, 01....., 99

UPS: (ACK<cr> if UPS accepts this command, otherwise, responds (NAK<cr>

Computer: VLINEC-<nn><cr> nn= 00, 01....., 99

UPS: (ACK<cr> if UPS accepts this command, otherwise, responds (NAK<cr>

**6.40 -VBYP±<nn> <cr>: Fine-turning bypass R voltage sampling value (for 2-2 6~10K, 3-1 3-3 10~20K)**

Computer: VBYP+<nn><cr> nn= 00, 01....., 99

UPS: (ACK<cr> if UPS accepts this command, otherwise, responds (NAK<cr>

Computer: VBYP-<nn><cr> nn= 00, 01....., 99

UPS: (ACK<cr> if UPS accepts this command, otherwise, responds (NAK<cr>

Example:

Computer: VBYP+56<cr>

UPS: (ACK<cr>

Means: Bypass R voltage will increase about 5.6 Volt.

**6.41 -VBYPB±<nn> <cr>: Fine-turning bypass S voltage sampling value (for 2-2 6~10K, 3-3 10~20K)**

Computer: VBYPB+<nn><cr> n= 00, 01....., 99

UPS: (ACK<cr> if UPS accepts this command, otherwise, responds (NAK<cr>

Computer: VBYPB-<nn><cr> n= 00, 01....., 99

UPS: (ACK<cr> if UPS accepts this command, otherwise, responds (NAK<cr>

**6.42 -VBYPC±<n> <cr>: Fine-turning bypass T voltage sampling value (for 3-3 10~20K)**

Computer: VBYPC+<n><cr> n= 00, 01....., 99

UPS: (ACK<cr> if UPS accepts this command, otherwise, responds (NAK<cr>

Computer: VBYPC-<n><cr> n= 00, 01....., 99

UPS: (ACK<cr> if UPS accepts this command, otherwise, responds (NAK<cr>

**6.43 -BUSP±<nn><cr>: Fine-turning positive bus voltage (for 2-2 6~10K, 3-1 3-3 10~20K)**

Computer: BUSP+<nn><cr>

Case Name:		Date:		Num:	
Case Num:		Version:		PAGE	62/68

UPS: (ACK<cr> if UPS accepts this command, otherwise, responds (NAK<cr>

Computer: BUSP -<nn><cr>

UPS: (ACK<cr> if UPS accepts this command, otherwise, responds (NAK<cr>

<n> is a number which ranging from 00, 01..... to 99.

**6.44 -BUSN±<nn><cr>: Fine-turning negative bus voltage (for 2-2 6~10K, 3-1 3-3 10~20K)**

Computer: BUSN+<nn><cr>

UPS: (ACK<cr> if UPS accepts this command, otherwise, responds (NAK<cr>

Computer: BUSN -<nn><cr>

UPS: (ACK<cr> if UPS accepts this command, otherwise, responds (NAK<cr>

<n> is a number which ranging from 00, 01..... to 99.

**6.45 -VB±<nn><cr>: Fine-turning battery voltage sampling value (for 2-2 6~10K, 3-1 3-3 10~20K)**

Computer: VB+<nn><cr>

UPS: (ACK<cr> if UPS accepts this command, otherwise, responds (NAK<cr>

Computer: VB-<nn><cr>

UPS: (ACK<cr> if UPS accepts this command, otherwise, responds (NAK<cr>

<n> is a number which ranging from 00, 01..... to 99.

**6.46 -VC±<nn><cr>: Fine-turning charger voltage sampling value (for 2-2 6~10K, 3-1 3-3 10~20K)**

Computer: VC+<nn><cr>

UPS: (ACK<cr> if UPS accepts this command, otherwise, responds (NAK<cr>

Computer: VC-<nn><cr>

UPS: (ACK<cr> if UPS accepts this command, otherwise, responds (NAK<cr>

<n> is a number which ranging from 00, 01..... to 99.

**6.47 -VOP±<nn> <cr>: Fine-turning output R voltage (for 2-2 6~10K, 3-1 3-3 10~20K)**

Computer: VOP+<nn> <cr> nn= 00, 01....., 99

Computer: VOP-<nn> <cr> nn= 00, 01....., 99

UPS: (ACK<cr> if UPS accepts this command, otherwise, responds (NAK<cr>

Example:

Case Name:		Date:		Num:	
Case Num:		Version:		PAGE	63/68

Computer: VOP+56<cr>

UPS: (ACK<cr>

Means: Output R voltage will increase about 5.6 Volt.

**6.48 -VOPS±<nn> <cr>: Fine-turning output S voltage (for 2-2 6~10K, 3-3 10~20K)**

Computer: VOPS+<nn> <cr> nn= 00, 01....., 99

Computer: VOPS-<nn> <cr> nn= 00, 01....., 99

UPS: (ACK<cr> if UPS accepts this command, otherwise, responds (NAK<cr>

Example:

Computer: VOPS+56<cr>

UPS: (ACK<cr>

Means: Output S voltage will increase about 5.6 Volt.

**6.49 -VOPT±<nn> <cr>: Fine-turning output T voltage (for 3-3 10~20K)**

Computer: VOPT+<nn> <cr> nn= 00, 01....., 99

Computer: VOPT-<nn> <cr> nn= 00, 01....., 99

UPS: (ACK<cr> if UPS accepts this command, otherwise, responds (NAK<cr>

Example:

Computer: VOPT+56<cr>

UPS: (ACK<cr>

Means: Output T voltage will increase about 5.6 Volt.

**6.50 BATCO<n.nn> <cr>: Setting the battery minimum cut-off voltage per cell**

Computer: BATCO<n.nn> <cr> n.nn= 1.67~1.83

UPS: (ACK<cr> if UPS accepts this command, otherwise, responds (NAK<cr>

Example:

Computer: BATCO1.75<cr>

UPS: (ACK<cr>

Means: The battery minimum cut-off voltage is 1.75V/cell.

**6.51 -IPT<t> <cr>: Setting the acceptable input line type (For line-Interactive UPS)**

Computer: IPT<t> <cr> t is N/W/G

UPS: (ACK<cr> if UPS accepts this command, otherwise, responds (NAK<cr>

Case Name:		Date:		Num:	
Case Num:		Version:		PAGE	64/68

N: Normal input, W: wide range input, G: Generator input.

Example:

Computer: IPTG<cr>

UPS: (ACK<cr>

Means: The acceptable input line type is Generator

### **6.52 -NL<nnn><cr>: Setting Neutral loss check (for 2-2 6~10K, 3-1 3-3 10~20K)**

Computer: NL<nnn> <cr>

UPS: (ACK<cr> if UPS accepts this command, otherwise, responds (NAK<cr>

<nnn> is three characters which can be ATO, CHE, DIS.

ATO means the UPS will automatically detect the neutral loss or not. And automatically clear the neutral loss alarm if the neutral is restored;

CHE means the UPS will automatically detect the neutral loss. But if the neutral loss alarm is triggered, the UPS will not automatically clear the neutral loss alarm and go back to normal mode even if neutral is restored. That means the user must clear the neutral loss alarm and make the UPS go back to normal mode by sending this option.

DIS means the UPS will not detect the neutral loss or not.

Example:

Computer: NLATO<cr>

UPS: (ACK<cr>

### **6.53 -BATCAP<nn><cr>:Setting battery capacity(for combo6-10K)**

Computer: BATCAP <nn><cr>

UPS: (ACK<cr> if UPS accepts this command, otherwise, responds (NAK<cr>

nn is 007,009,010,017,040,065,100

### **6.54 -BATCOEF<n.n><cr>: Setting battery capacity coefficient(for combo6-10K)**

Computer: BATCOEF <nn><cr>

UPS: (ACK<cr> if UPS accepts this command, otherwise, responds (NAK<cr>

nn is from 0.5 to 2.0

### **6.55 -VDCR±<nn> <cr>: Fine-tuning inverter R DC voltage (for 3-3 10~20K)**

Computer: VDCR+<nn> <cr> nn= 00, 01....., 99

Computer: VDCR-<nn> <cr> nn= 00, 01....., 99

UPS: (ACK<cr> if UPS accepts this command, otherwise, responds (NAK<cr>

Example:



Case Name:		Date:		Num:	
Case Num:		Version:		PAGE	65/68

Computer: VDCR+10<cr>

UPS: (ACK<cr>

Means: Output R DC voltage will increase about 10mv.

**6.56 -VDCS±<nn> <cr>: Fine-turning inverter S DC voltage (for 3-3 10~20K)**

Computer: VDCS+<nn> <cr> nn= 00, 01....., 99

Computer: VDCS-<nn> <cr> nn= 00, 01....., 99

UPS: (ACK<cr> if UPS accepts this command, otherwise, responds (NAK<cr>

Example:

Computer: VDCS+10<cr>

UPS: (ACK<cr>

Means: Output S DC voltage will increase about 10mv.

**6.57 -VDCT±<nn> <cr>: Fine-turning inverter T DC voltage (for 3-3 10~20K)**

Computer: VDCT+<nn> <cr> nn= 00, 01....., 99

Computer: VDCT-<nn> <cr> nn= 00, 01....., 99

UPS: (ACK<cr> if UPS accepts this command, otherwise, responds (NAK<cr>

Example:

Computer: VDCT-10<cr>

UPS: (ACK<cr>

Means: Output T DC voltage will decrease about 10mv.

**6.58 VSOC<nnn> <cr>: set voltage of start over charge(for combo6-10K Rack Li)**

Computer: VSOC<nnn> <cr> nnn= 130,131,.....,143, represent 13V/cell.....14.3V/cell

UPS: (ACK<cr> if UPS accepts this command, otherwise, responds (NAK<cr>

Example:

Computer: VSOC135<cr>

UPS: (ACK<cr>

**6.59 BATTAH<nnnn><cr>: Setting battery Total AH**

Computer: BATTAH<nnnn><cr>

Device: (ACK<cr> if UPS accepts this command, otherwise, responds (NAK<cr>

Case Name:		Date:		Num:	
Case Num:		Version:		PAGE	66/68

nnnn is from 0001 to 9999, unit: AH

For firmware implementing, the battery total AH can be used to calculate the battery group number(=Total AH/Rating AH)

### 6.60 PST<PP><cr>: Setting the period of period self test

Computer: PST<PP><cr>

Device: (ACK<cr> if UPS accepts this command, otherwise, responds (NAK<cr>

PP: Period is from 00~99, unit: day, 00: Disable period self test.

### 6.61 -TSET<YYYYMMWDDHHNNSS><cr>: Set Time

Computer: TSET<YYYYMMWDDHHNNSS><cr>

Device: (ACK<cr> if device accepts this command, otherwise, responds (NAK<cr>

YYYY = four ASCII digits indicating current year

MM = two ASCII digits indicating current month

W = one ASCII digits indicating current week

DD = two ASCII digits indicating current day

HH = two ASCII digits indicating current hour

NN = two ASCII digits indicating current minute

SS = two ASCII digits indicating current second

### 6.62 -STSET<W><N><AAAABBBBCCCCDDDD><cr>: Set Scheduled Time Zone

Computer: STSET<W><N><AAAABBBBCCCCDDDD><cr>

Device: (ACK<cr> if device accepts this command, otherwise, responds (NAK<cr>

W = one ASCII digits, 0:weekdays, 1:weekends

N = one ASCII digits, 0: Phase 0, 1: Phase 1

AAAA = four ASCII digits indicating charge start hour and minute

BBBB = four ASCII digits indicating charge end hour and minute

CCCC = four ASCII digits indicating discharging start hour and minute

DDDD = four ASCII digits indicating discharging end hour and minute

Case Name:		Date:		Num:	
Case Num:		Version:		PAGE	67/68

**6.63 -DWHRST<cr>: Reset discharging watt-hour information in eeprom**

Computer: DWHRST<cr>

Device: (ACK<cr> if device accepts this command, otherwise, responds (NAK<cr>

**6.64 -MM<xxx.....><cr>: modify Manufacturer name; (only for X9)**

Computer: MM<xxx.....><cr>: <xxx.....> the max length is 13 characters;

Device: (ACK<cr> if device accepts this command, otherwise, responds (NAK<cr>

**6.65 -MU<xxx.....><cr>: modify UPS Unit name; (only for X9)**

Computer: MU<xxx.....><cr>: <xxx.....> the max length is 10 characters;

Device: (ACK<cr> if device accepts this command, otherwise, responds (NAK<cr>

**6.66 -MD<nnnn><cr>: modify Manufacturer name; (only for X9)**

Computer: MM<xxx.....><cr>: <nnnn> the range is 0000~1500;

Device: (ACK<cr> if device accepts this command, otherwise, responds (NAK<cr>

**6.67 -PP1E<cr>: Enable the output program function ; (only for X9)**

Computer: PP1E<cr>:

Device: (ACK<cr> if device accepts this command, otherwise, responds (NAK<cr>

**6.68 -PP1D<cr>: Disable the output program function; (only for X9)**

Computer: PP1D<cr>;

Device: (ACK<cr> if device accepts this command, otherwise, responds (NAK<cr>

**6.69 -I<n><cr>: Setting the input transformer ratio (for Galleon 1-1, 3-3)**

Computer: I<n><cr>

UPS: (ACK<cr>

if UPS accepts this command, otherwise, responds (NAK<cr>

Means: <n> is the input transformer ratio, can be 1.0, 1.7, 2.0. The UPS will display the input voltage and current according to the ratio.

For example:

I1.0<cr> means the UPS displaying the real input voltage and current(measured by UPS).

Case Name:		Date:		Num:	
Case Num:		Version:		PAGE	68/68

I1.7<cr> means the UPS displaying the input voltage which value = the real input voltage /  $\sqrt{3}$

and the current which value = the real input current \*  $\sqrt{3}$ .

I2.0<cr> means the UPS displaying the input voltage which value = the real input voltage / 2  
and the current which value = the real input current \* 2.

### 6.70 -O<n><cr>: Setting the output transformer ratio (for Galleon 1-1, 3-3)

Computer: O<n><cr>

UPS: (ACK<cr>

if UPS accepts this command, otherwise, responds (NAK<cr>

Means: <n> is the output transformer ratio, can be 1.0, 1.7, 2.0. The UPS will display the output voltage and current according to the ratio.

For example:

O1.0<cr> means the UPS displaying the real output voltage and current(measured by UPS).

O1.7<cr> means the UPS displaying the output voltage which value = the real output voltage/ $\sqrt{3}$  and the current which value = the real output current \*  $\sqrt{3}$ .

O2.0<cr> means the UPS displaying the output voltage which value = the real output voltage/2  
and the current which value = the real output current \* 2.