HPR33 Series
UPS Communication Protocol

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CATALOGUE

1 Document Description

1.1 Goals

This document specifies the RS232 communication protocol used in the Galleon II 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 setting Command. By sending the control commands you can control the UPS.
3. Introducing the calibration Command. By sending the calibration Command you can calibration 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 “,” separate the data.
7. In a UPS’s response, if there is no data, with “-” instead of data, and the length of the “-” as long as data.
8. In a UPS’s response, if some data length is less than the definition, type enough “#” before the data.

1.3 Reference document

None

1.4 Glossary – Abbreviations – Notations

None

2 CRC Description

The CRC in this document is a general standard of CRC-16 and is generated by the Half Byte look-up table method.

The Table is as follows:

crc_ta = {

0x0000,0x1021,0x2042,0x3063,0x4084,0x50a5,0x60c6,0x70e7,
0x8108,0x9129,0xa14a,0xb16b,0xc18c,0xd1ad,0xe1ce,0xf1ef
}

The CRC generate method is show as below:

```
crc=0;
while(len--!=0)                                    ……..1
{
    da=((INT8U)(crc>>8))>>4;
    crc<<=4;
    crc^=crc_ta[da^(((*ptr)&0xFF)>>4)];        ……..2
    da=((INT8U)(crc>>8))>>4;
    crc<<=4;
    crc^=crc_ta[da^(*ptr&0x0f)];
    ptr++;
}
```

For example:

UPS respond as follows data ^D007PI35<CRCH><CRCL><0x0d>

1,len means the length of data form '^' to '5',equal to 9;

2,*ptr means get the data from the first responding data address, this is '^'.

When calculate the crc ,<CRCH> equal to (crc >>8)&0xFF, means the high byte of CRC; <CRCL> equal to crc&0xFF, means the low byte of CRC.

3 Hardware Description

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

Cabling:

COMPUTER		UPS
RX (pin2)	<---------->	TX
TX (pin3)	<---------->	RX
GND (pin5)	<---------->	GND

(9 pins female D-type connector)

4 UPS Respond Description

The UPS responding contents are as follows:

^DNNNAA,BBB.B,CCC.C,DDD.D…..<CRCH><CRCL><cr>

"^D" is a fixed form.

"NNN" means the length of the responding data (from the byte after NNN to byte <cr>).

"AA,BBB.B,CCC.C,DDD.D…..":means responding data(refe to 5~7 chapter).

<CRCH>:means the high byte of CRC.

<CRCL>:means the low byte of CRC.

<cr>:means the end of a response.(This document also writes as <0x0d>)

5 Inquiry Command

5.1 ^P005Q3GS<0x0d>: The general status parameters inquiry

Computer: ^P005Q3GS<0x0d>

UPS:^D113AA,BBB.B,CCC.C,DDD.D,EE.E,FFF.F,GGG.G,HHH.H,II.I,JJJ.J,KKK.K,LLL.L,MMM.M,NNN.N,OOO.O,PPP.P,QQQ.Q,RRR.R,SSS,b9b8b7b6b5b4b3b2b1b0a0<CRC H><CRC L><0x0d>

AA	UPS Work mode
BBB.B	Line Voltage R
CCC.C	Line Voltage S
DDD.D	Line Voltage T
EE.E	Line frequency
FFF.F	Output Voltage R
GGG.G	Output Voltage S
HHH.H	Output Voltage T
II.I	Output Frequency
JJJ.J	Output Current R
KKK.K	Output Current S
LLL.L	Output Current T
MMM.M	Load Percent R
NNN.N	Load Percent S
OOO.O	Load Percent T
PPP.P	Total Load Percent
QQQ.Q	Battery voltage P

RRR.R	Battery voltage N
SSS	Max temperature
b9b8	Ups type 00: standy 01: line-interactive 10: on-line
b7	Utility Fail
b6	Battery Low
b5	Bypass mode
b4	UPS Failed
b3	EPO active
b2	Test in Progress
b1	Shutdown Active
b0	mute status (bat silence)
a0	battery test ok

5.2 ^P005Q3LD<0x0d>: The Load Information Inquiry

Computer: ^P005Q3LD<0x0d>

UPS:^D0109AAA.A,BBB.B,CCC.C,DDD.D,EEE.E,FFF.F,GGG.G,HHH.H,III.I,JJJ.J,KKK.K,LLL.L,MMMMM,NNNNN,OOOOO,PPPPP,QQQQQ,RRRRR<CRCH><CRCL><0x0d>

AAA.A	Max Load Percent R
BBB.B	Max Load Percent S
CCC.C	Max Load Percent T
DDD.D	Max Total Percent
EEE.E	Load VA Percent R
FFF.F	Load VA Percent S
GGG.G	Load VA Percent T
HHH.H	Load VA Total Percent
III.I	Load Watt Percent R
JJJ.J	Load Watt Percent S
KKK.K	Load Watt Percent T
LLL.L	Load Watt Total Percent
MMMMM	Load VA R
NNNNN	Load VA S
OOOOO	Load VA T
PPPPP	Load Watt R

QQQQQ Load Watt S
RRRRR Load Watt T

5.3 ^P004Q3Y<0x0d>: The Bypass Information Inquiry

Computer: ^P004Q3Y<0x0d>

UPS: ^D043AAA.A,BBB.B,CCC.C,DDD.D,EEE.E,FFF.F,GG.G<CRC H><CRC L><0x0d>

AAA.A	Bypass Voltage R
BBB.B	Bypass Voltage S
CCC.C	Bypass Voltage T
DDD.D	Bypass Current R
EEE.E	Bypass Current S
FFF.F	Bypass Current T
GG.G	Bypass Frequency

5.4 ^P005QBRT<0x0d>: The battery fixed paramater inquiry

Computer: ^P005QBRT<0x0d>

UPS: ^D033AA.A,BB.B,CCC,DDD.D,EE.E,FF.F,GG,HHH<CRC H><CRC L><0x0d>

Item	Description	Range	
AA.A	Reserved	120	120
BB.B	Battery shutdown voltage	10.5V~12.0V	10.7
CC.C	Battery Low voltage	(Under 点+0.1V)~(Under 点+2V)	11
DDD	Reserved	0	0
EEE.E	Reserved	4.0	4.0
FF.F	Battery High voltage	14.0~15.0	14
GG	battery cell number	16~20	16/18/19/20
HHH	Reserved	0	0

5.5 ^P005QBTT<0x0d>: Battery test Mode end time inquiry

Computer: ^P005QBTT<0x0d>

UPS: ^D011AAA,CC.C<CRC H><CRC L><0x0d>

AAA	Battery test stop time (minute)	001~240	Battery test stop time (second)
CC.C	Battery test stop voltage(V)	11.0~12.0	Battery test stop time (minute)

5.6 ^P004QBV<0x0d>: battery voltage paramater inquiry

Computer: ^P004QBV<0x0d>

UPS:^D049AAA.A,BBB.B,CCCC.C,DDD.D,EEE.E,FFFF.F,GGG,HHHH<CRC.H><CRC L><0x0d>

AAA.A	Battery Voltage P	V
BBB.B	Battery Charging Current P	A
CCCC.C	Battery Discharging Current P	A
DDD.D	Battery Voltage N	V
EEE.E	Battery Charging Current N	A
FFFF.F	Battery Discharging Current N	A
GGG	Battery Residual Capacity	%
HHHH	Reserved	0

5.7 ^P005QFLG<0x0d>: Setting flag status inquiry

Computer: ^P005QFLG<0x0d>

UPS: ^D065A0B0C0…Z0a0…e1<CRC H><CRC L><0x0d>

A	Enable/disable all audible alarm（完全静音）
B	Enable/disable battery mode warning mute
C	Enable/disable code start(The gray means not support now.)
D	Enable/disable battery open status check
E	Enable/disable high efficiency mode（ECO mode）
F	Enable/disable bypass forbidden
G	Enable/disable energy saving
H	Enable/disable short restart 3 times
I	Enable/disable inverter short clear function
J	Enable/disable Output socket1 when the delay release time is over in battery mode .
K	Enable/disable Output socket2 when the delay release time is over in battery mode.
L	Enable/disable Site fault detect
M	Enable/disable hot standby function

N	Enable/disable deep high efficiency mode
O	Enable/disable bypass when UPS turn off.（bps enable/disable）
P	Enable/disable bypass audible warning
Q	Enable/disable Constant Phase Angle function
R	Enable/disable auto-restart
S	Enable/disable battery deep discharge protect
T	Enable/disable battery low protect (if disable, the battery will discharge to 6V)
U	Enable/disable Free run function
V	Enable/disable converter mode
W	Enable/disable limited runtime on battery mode
X	Enable/disable output parallel function in phase angle 0
Y	Enable/disable phase auto adapt
Z	Enable/disable period battery test
a	Enable/disable power walk in delay function
b	Enable/disable battery test stop by time
c	Enable/disable battery test stop by voltage
d	Enable/disable work without battery
e **f** **g** **h** **i**	Enable/disable frequency auto detection Enable/disable auto bateery test function Enable/disable waring mute Enable/disable fault mute Enable/disable all mode mute

5.8 ^P004QFS<0x0d>: The last fault code inquiry

Computer：^P004QFS<0x0d>

UPS: ^D005AA<CRC H><CRC L><0x0d>

Fault 类别	Fault 名称	Fault 代码	Fault 描述
Bus/converter	Bus start fail	0x01	规定时间内，bus 电压未达到设定值。

fault	Bus volt over	0x02	Bus 电压超过上限值。
	Bus volt under	0x03	Bus 电压低于下限值。
	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。
	PFC IGBT over current	0x07	PFC IGBT 电流过大
	Input contact fault	0x08	输入接触器故障
Inverter fault	Inverter soft start 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 short fault	0x21	Battery scr 短路故障
	Line SCR short fault	0x22	Line scr 短路故障
	Inverter relay open fault	0x23	Inverter relay 开路故障
	Inverter relay/STS short fault	0x24	Inverter relay 或者 STS 短路故障
	Wiring fault	0x25	输入输出线路反接故障
	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
	Charger output short	0x2A	Charger 输出端短路
	BypScrFault	0x2B	Bypass relay 或者 STS 短路故障
Parallel system fault（待实现）	CAN communication fault	0x31	CAN bus 通信故障。(support)
	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，
	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	机型设置错误
	MCU communication fault	0x47	控制板与通讯板 MCU 通信故障
	DSP firmware version incompatible	0x48	控制板软体版本不兼容
	IpOPPhaseError	0x49	输入输出相序不兼容
		0x4A	
		0x4B	
		0x4C	
		0x4D	

	0x4E	
	0x4F	
BypScrShort	0x61	旁路 SCR 短路
BypScrOpen	0x62	旁路 SCR 开路
RINVWaveAbnormal	0x63	R 相逆变波形不正常
SINVWaveAbnormal	0x64	S 相逆变波形不正常
TINVWaveAbnormal	0x65	T 相逆变波形不正常
CTSatiation	0x66	CT 饱和
BypassOutputShort(L-N)	0x67	旁路相短路
BypassOutputShort(L-L)	0x68	旁路线短路
InvScrShort	0x69	逆变 SCR 短路

*GRAY: Not Support

*RED: New Add

5.9 ^P004QID<0x0d>: UPS serial number inquiry

Computer: ^P004QID<0x0d>

UPS: ^D021AAAAAAAAAAAAAAAAAA<CRC H><CRC L><0x0d>

*Fixed Length 17

5.10 ^P004QMD<0x0d>: UPS Mode inquiry

Computer: ^P004QMD<0x0d>

UPS: ^D042AAxxxxxxxx,BBBBBB,CCC,DDD,EEE,FF,GG<CRC H><CRC L><0x0d>

AAxxxxxxxx	unit Name (10 Bytes)		GALLEON2 显示容量信息
BBBBBB	Rating ouput VA (w)		额定功率
CCC	Output Factor	090 means PF 0.9	
DDD	Input phase/Output phase	fixed 3/3	
EEE	Input Rating voltage		
FFF	Output Rating voltage		
GG	battery piece number		电池节数
HH	voltage per cell		固定显示 12v

*This whole length is 10bits, if the model value less than 10 bits, use “#” instead before the UPS model, for example: GALLEON2 3-3 40KL Standard: #GAL2 40KL; GALLEON2 3-3 40KS Standard: ##GAL2 40K,

5.11 ^P004QPI<0x0d>: Protocol ID Inquiry

Computer: ^P004QPI<0x0d>

UPS: ^D007PI38<CRC H><CRC L><0x0d>

*Fixed PI38:Galleon2 3-3 UPS

5.12 ^P005QRHL<0x0d> : UPS Range inquiry

Computer：^P005QRHL<0x0d>

UPS:^D052AAA,BBB,CC,DD,EEE,FFF,GG.G,HH.H,III,JJJ,KK.K,LL.L<CRCH><CRCL><0x0d>

AAA	Line Voltage High
BBB	Line Voltage Low
CC.C	Line Frequency High
DD.D	Line Frequency Low
EEE	Bypass Voltage High
FFF	Bypass Voltage Low
GG.G	Bypass Frequency High
HH.H	Bypass Frequency Low
III	ECO Voltage High
JJJ	ECO Voltage Low
KK.K	ECO Frequency High
LL.L	ECO Frequency Low

5.13 ^P004QRI<0x0d>: UPS Rating Information inquiry

Computer: ^P004QRI<0x0d>

UPS: ^D022AAA.A,CCC.C,DDD,EE.E<CRC H><CRC L><0x0d>

AAA.A	Rating output voltage
CCC.C	Rating battery voltage
DDD	Reserved
EE.E	Rating output frequency

5.14 ^P005QTPR<0x0d>: The temperature inquiry

Computer: ^P005QTPR<0x0d>

UPS: ^D018AAA,BBB,CCC,DDD<CRC H><CRC L><0x0d>

AAA temperature 1
BBB temperature 2
CCC Temperature 3
DDD Max temperature

5.15 ^P005QVFW<0x0d>::DSP and CPU Firmware version inquiry

Computer: ^P005QTPR<0x0d>

UPS: ^D024AAAA,BB.CC,DDDD,EE.FF,GGGG,HH.II<CRC H><CRC L><0x0d>

AAAA DSP1 firmware number
BB DSP1 firmware version
CC DSP1 firmware extra version
DDDD MCU firmware number
EE MCU firmware version
FF MCU firmware extra version

5.16 ^P004QWS<0x0D>: Warning Status Inquiry

Computer: ^P004QWS<0x0D>

UPS: ^D075a0a1…a71<CRC H><CRC L><0x0d>

bit	code		note
a0	1	Battery open	电池未接报警。
a1	2	IP N loss	输入 N 线丢失报警。
a2	3	IP site fail	输入零火线接反报警。
a3	4	Line phase error	三相输入时，市电 L1/L2/L3 相序错误。
a4	5	Bypass phase error	三相输入时，旁路 L1/L2/L3 相序错误。
a5	6	Bypass frequency unstable	旁路输入频率变化过快，超出 UPS 锁相能力。
a6	7	Battery over charge	电池过充报警。
a7	8	Battery low	电池低压报警。

a8	9	Overload warning	过载报警。
a9	0A	Fan lock warning	风扇模组堵转报警。（GALLEON2 加入）
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	CHGFail	CHG 故障（GALLEON2 更改）
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 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。（GALLEON2 加入）
a33	22	Bypass connect different	并机系统各模块旁路连接不一致。（GALLEON2 加入）
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。
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	PFC 输入电流不平衡告警。

		AC input current unbalance	
a52	35	Battery Phase loss	电池相序丢失
a53	36	Inverter current unbalance	逆变并板不均流告警。（GALLEON2 加入）
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（GALLEON2 不支持）
a56	39	Warning for input phase error	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（GALLEON2 加入）
a60	3D	Bypass unstable	旁路状态不稳定（GALLEON2 加入）
a62		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		Discharger overly	电池过放电告警,需要进行保护
a64		Battery too high	电池电压远高于 overcharge 点
a65		Battery too low	电池电压过低
a66	3E	Battery Volt High	电池电压过高（GALLEON2 对应告警码不一样）
a67	3F	Battery Volt Unbalance	电池电压不平衡（GALLEON2 对应告警码不一样）
a68	40	CHG Short	CHG 短路（GALLEON2 对应告警码不一样）

*GRAY:Not Support Now
*RED:New Add

5.17 ^P008QINTYPE<0x0D>:INPUT TYPE INQUIRY

Computer: ^P008QINTYPE<0x0D>

UPS: ^D012A……<CRC H><CRC L><0x0d>

A	intype	0/1	‘0’ : Line
BBBBBBBBBB	-generator/-#####line		‘1’ : Generator

*New Add

6 Set Command

6.1 ^S005BOFF<0x0d>: Silence buzzer beep

Computer: ^S005BOFF<0x0d>

UPS: ^D006ACK<CRC H><CRC L><0x0d>

if UPS accepts this command, otherwise, responds ^D006NAK<CRC H><CRC L><0x0d>

Means: The buzzer beep silence .

6.2 ^S004BON<0x0d>: buzzer beep open

Computer: ^S004BON<0x0d>

UPS: ^D006ACK<CRC H><CRC L><0x0d>

if UPS accepts this command, otherwise, responds ^D006NAK<CRC H><CRC L><0x0d>

Means: The buzzer beep open

6.3 ^S005CFTD<0x0d>: default calibration factor

Computer: ^S005CFTD<0x0d>

UPS: ^D006ACK<CRC H><CRC L><0x0d>

if UPS accepts this command, otherwise, responds ^D006NAK<CRC H><CRC L><0x0d>

Means: Restore calibration factor

*take effect when UPS turn on next time

6.4 ^S009CHMC00.9<0x0d>: set charging current

Computer: ^S009CHMC00.9<0x0d>

UPS: ^D006ACK<CRC H><CRC L><0x0d>

if UPS accepts this command, otherwise, responds ^D006NAK<CRC H><CRC L><0x0d>

Means: set the max charging current, unit is A

6.5 ^S003CS<0x0d>:cancel shutdown and restore

Computer: ^S003CS<0x0d>

UPS: ^D006ACK<CRC H><CRC L><0x0d>

if UPS accepts this command, otherwise, responds ^D006NAK<CRC H><CRC L><0x0d>

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)

6.6 ^S003CT<0x0d>: cancel battery test

Computer: ^S003CT<0x0d>

UPS: ^D006ACK<CRC H><CRC L><0x0d>

if UPS accepts this command, otherwise, responds ^D006NAK<CRC H><CRC L><0x0d>

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

6.7 ^S009PHFH52.0<0x0d>:set eco freq high loss point

Computer: ^S009PHFH52.0<0x0d>

UPS: ^D006ACK<CRC H><CRC L><0x0d>

if UPS accepts this command, otherwise, responds ^D006NAK<CRC H><CRC L><0x0d>

Means: Set ECO freq high loss point,unit is Hz;The max freq point is 52.0Hz

6.8 ^S009PHFL48.0<0x0d>:set eco freq low loss point

Computer: ^S009PHFL48.0<0x0d>

UPS: ^D006ACK<CRC H><CRC L><0x0d>

if UPS accepts this command, otherwise, responds ^D006NAK<CRC H><CRC L><0x0d>

Means: Set ECO freq low loss point,unit is Hz;The min freq point is 48.0Hz

6.9 ^S008PHVH240<0x0d>:set eco voltage high loss

Computer: ^S008PHVH240

UPS: ^D006ACK<CRC H><CRC L><0x0d>

if UPS accepts this command, otherwise, responds ^D006NAK<CRC H><CRC L><0x0d>

Means: Set ECO voltage high loss point,unit is V;The max freq point is (op volt+11V)

6.10 ^S008PHVL200<0x0d>:seteco voltage Low loss

Computer: ^S008PHVL200<0x0d>

UPS: ^D006ACK<CRC H><CRC L><0x0d>

if UPS accepts this command, otherwise, responds ^D006NAK<CRC H><CRC L><0x0d>

Means: Set ECO voltage loss point,unit is V;The min voltage point is (op volt-11V)

6.11 ^S005PFTD<0x0d>:default parameter Factor

Computer: ^S005PFTD<0x0d>

UPS: ^D006ACK<CRC H><CRC L><0x0d>

if UPS accepts this command, otherwise, responds ^D006NAK<CRC H><CRC L><0x0d>

Means: Set the bypass voltage and freq to default

Set the ECO voltage and freq to default

Set the Control Flag to default

6.12 ^S009PSFH52.0<0x0d>:set bypass freq high loss point

Computer: ^S009PSFH52.0<0x0d>

UPS: ^D006ACK<CRC H><CRC L><0x0d>

if UPS accepts this command, otherwise, responds ^D006NAK<CRC H><CRC L><0x0d>

Means: set bypass freq high loss point ,unit is Hz; The high freq range is 51~54Hz or 61~64Hz

6.13 ^S009PSFL48.0<0x0d>:set bypass freq low loss point

Computer: ^S009PSFL48.0<0x0d>

UPS: ^D006ACK<CRC H><CRC L><0x0d>

if UPS accepts this command, otherwise, responds ^D006NAK<CRC H><CRC L><0x0d>

Means: set bypass freq low loss point ,unit is Hz; The low freq range is 51~54Hz or 61~64Hz

6.14 ^S010PSVH240.0<0x0d>:set bypass voltage high loss point

Computer: ^S010PSVH240.0<0x0d>

UPS: ^D006ACK<CRC H><CRC L><0x0d>

if UPS accepts this command, otherwise, responds ^D006NAK<CRC H><CRC L><0x0d>

Means: set bypass voltage high loss point, unit isV; The high voltage range is 231~276V

6.15 ^S010PSVL200.0<0x0d>:set bypass voltage low loss point

Computer: ^S010PSVL200.0<0x0d>

UPS: ^D006ACK<CRC H><CRC L><0x0d>

if UPS accepts this command, otherwise, responds ^D006NAK<CRC H><CRC L><0x0d>

Means: set bypass voltage high loss point, unit is V; The high voltage range 176~209V

6.16 ^S005REEP<0x0d>:restore eeprom date

Computer: ^S005REEP<0x0d>

UPS: ^D006ACK<CRC H><CRC L><0x0d>

if UPS accepts this command, otherwise, responds ^D006NAK<CRC H><CRC L><0x0d>

Means: Restore eeprom date to default

*take effect when UPS turn on next time

6.17 ^S009SBHV15.0<0x0d>:set the battery high warning voltage

Computer: ^S009SBHV15.0<0x0d>

UPS: ^D006ACK<CRC H><CRC L><0x0d>

if UPS accepts this command, otherwise, responds ^D006NAK<CRC H><CRC L><0x0d>

Means: Set the battery high warning voltage, unit is V/pcs; The voltage range is 14.0~15.0V

6.18 ^S009SBLV11.4<0x0d>:set the battery low warning voltage

Computer: ^S009SBLV11.4<0x0d

UPS: ^D006ACK<CRC H><CRC L><0x0d>

if UPS accepts this command, otherwise, responds ^D006NAK<CRC H><CRC L><0x0d>

Means: set the battery low warning voltage, unit is V/pcs; The voltage range is (Under volt Point+0.1V)~(Under volt Point +2V)

6.19 ^S009SBSV10.5<0x0d>:set the battery under(shutdown) voltage

Computer: ^S009SBSV10.5<0x0d>

UPS: ^D006ACK<CRC H><CRC L><0x0d>

if UPS accepts this command, otherwise, responds ^D006NAK<CRC H><CRC L><0x0d>

Means: Set the battery under(shutdown) voltage, unit is V/pcs; The voltage range is 10.5~12.0V

6.20 ^S008SOPV220<0x0d>:set output voltage

Computer: ^S008SOPV220<0x0d>

UPS: ^D006ACK<CRC H><CRC L><0x0d>

if UPS accepts this command, otherwise, responds ^D006NAK<CRC H><CRC L><0x0d>

Means: set output voltage,unit is V;The volt point is 208\220\230\240V

6.21 ^S005SN.6<0x0d>:set shut down time in nn minute

Computer: ^S005SN.6<0x0d>

UPS: ^D006ACK<CRC H><CRC L><0x0d>

if UPS accepts this command, otherwise, responds ^D006NAK<CRC H><CRC L><0x0d>

Means: Set shut down time in nn minute

6.22 ^S005SOFF<0x0d>:turn off the UPS

Computer: ^S005SOFF<0x0d>

UPS: ^D006ACK<CRC H><CRC L><0x0d>

if UPS accepts this command, otherwise, responds ^D006NAK<CRC H><CRC L><0x0d>

Means: turn off the UPS

6.23 ^S004SON<0x0d>:turn on the UPS

Computer: ^S004SON<0x0d>

UPS: ^D006ACK<CRC H><CRC L><0x0d>

if UPS accepts this command, otherwise, responds ^D006NAK<CRC H><CRC L><0x0d>

Means: turn on the UPS

6.24 ^S009SOPF60.0<0x0d>:set the output frequency

Computer: ^S009SOPF60.0<0x0d>

UPS: ^D006ACK<CRC H><CRC L><0x0d>

if UPS accepts this command, otherwise, responds ^D006NAK<CRC H><CRC L><0x0d>

Means: Set UPS output nominal frequency to 50Hz or 60Hz. (Only in bypass mode)

6.25 ^S005SPDA<0x0d>:disable control flag

Computer: ^S005SPDA<0x0d>

UPS: ^D006ACK<CRC H><CRC L><0x0d>

if UPS accepts this command, otherwise, responds ^D006NAK<CRC H><CRC L><0x0d>

Means: Disable control flag

No	Control setting
A	Enable/disable all audible alarm（完全静音）

B	Enable/disable battery mode warning mute
C	Enable/disable code start(The gray means not support now.)
D	Enable/disable battery open status check
E	Enable/disable high efficiency mode（ECO mode）
F	Enable/disable bypass forbidden
G	Enable/disable energy saving
H	Enable/disable short restart 3 times
I	Enable/disable inverter short clear function
J	Enable/disable Output socket1 when the delay release time is over in battery mode .
K	Enable/disable Output socket2 when the delay release time is over in battery mode.
L	Enable/disable Site fault detect
M	Enable/disable hot standby function
N	Enable/disable deep high efficiency mode
O	Enable/disable bypass when UPS turn off.（bps enable/disable）
P	Enable/disable bypass audible warning
Q	Enable/disable Constant Phase Angle function
R	Enable/disable auto-restart
S	Enable/disable battery deep discharge protect
T	Enable/disable battery low protect (if disable, the battery will discharge to 6V)
U	Enable/disable Free run function
V	Enable/disable converter mode
W	Enable/disable limited runtime on battery mode
X	Enable/disable output parallel function in phase angle 0
Y	Enable/disable phase auto adapt
Z	Enable/disable period battery test
a	Enable/disable power walk in delay function
b	Enable/disable battery test stop by time

c	Enable/disable battery test stop by voltage
d	Enable/disable work without battery
e	Enable/disable frequency auto detection
f	Enable/disable auto bateery test function
g	Enable/disable waring mute
h	Enable/disable fault mute
i	Enable/disable all mode mute

*GRAY: Not support now

6.26 ^S005SPEA<0x0d>:enable control flag

Computer: ^S005SPEA<0x0d>

UPS: ^D006ACK<CRC H><CRC L><0x0d>

if UPS accepts this command, otherwise, responds ^D006NAK<CRC H><CRC L><0x0d>

Means: Enable control flag

6.27 ^S007SR0010<0x0d>:restart in nnnn minute

Computer: ^S007SR0010<0x0d>

UPS: ^D006ACK<CRC H><CRC L><0x0d>

if UPS accepts this command, otherwise, responds ^D006NAK<CRC H><CRC L><0x0d>

Means: Set restart time in nnnn minute

6.28 ^S022STID0123456789abcedef<0x0d>:set ups serial number

Computer: ^S022STID0123456789abcedef<0x0d>

UPS: ^D006ACK<CRC H><CRC L><0x0d>

if UPS accepts this command, otherwise, responds ^D006NAK<CRC H><CRC L><0x0d>

Means: Set the serial number of UPS

*This whole length is 17bits, if the value less than 17bits, use “0” to instead

6.29 ^S004T10<0x0d>:do battery test for 10 second

Computer: ^S004T10<0x0d>

UPS: ^D006ACK<CRC H><CRC L><0x0d>

if UPS accepts this command, otherwise, responds ^D006NAK<CRC H><CRC L><0x0d>

Means: do battery test for 10 second

6.30 ^S003TL<0x0d>:do battery test until battery low

Computer: ^S003TL<0x0d>

UPS: ^D006ACK<CRC H><CRC L><0x0d>

if UPS accepts this command, otherwise, responds ^D006NAK<CRC H><CRC L><0x0d>

Means: do battery test until battery low

6.31 ^S005TN.8<0x0d>:do battery test for nn minute

Computer: ^S005TN.8<0x0d>

UPS: ^D006ACK<CRC H><CRC L><0x0d>

if UPS accepts this command, otherwise, responds ^D006NAK<CRC H><CRC L><0x0d>

Means: do battery test for nn minute

6.32 ^S009SINTYPE<n><0x0d>:set input Type Line or generator

Computer: ^S009SINTYPE<n><0x0d>

UPS: ^D006ACK<CRC H><CRC L><0x0d>

if UPS accepts this command, otherwise, responds ^D006NAK<CRC H><CRC L><0x0d>

Means: set input Type Line or generator

*'0':normal line input;

'1': generator input

7 Calibration Command

7.1 ^C008RLV+007<0x0d>: calibration R line voltage

Computer: ^C008RLV+007<0x0d>

UPS: ^D006ACK<CRC H><CRC L><0x0d>

if UPS accepts this command, otherwise, responds ^D006NAK<CRC H><CRC L><0x0d>

Means: Calibration R line voltage percent value; The range of the value is 0~10%

7.2 ^C008SLV+007<0x0d>: calibration S line voltage

Computer: ^C008SLV+007<0x0d>

UPS: ^D006ACK<CRC H><CRC L><0x0d>

if UPS accepts this command, otherwise, responds ^D006NAK<CRC H><CRC L><0x0d>

Means: Calibration S line voltage percent value; The range of the value is 0~10%

7.3 ^C008TLV+007<0x0d>: calibration S line voltage

Computer: ^C008TLV+007<0x0d>

UPS: ^D006ACK<CRC H><CRC L><0x0d>

if UPS accepts this command, otherwise, responds ^D006NAK<CRC H><CRC L><0x0d>

Means: Calibration T line voltage percent value; The range of the value is 0~10%

7.4 ^C008ROV+007<0x0d>: calibration R output voltage

Computer: ^C008ROV+007<0x0d>

UPS: ^D006ACK<CRC H><CRC L><0x0d>

if UPS accepts this command, otherwise, responds ^D006NAK<CRC H><CRC L><0x0d>

Means: Calibration R Output voltage percent value; The range of the value is 0~10%.

7.5 ^C008SOV+007<0x0d>: calibration R output voltage

Computer: ^C008SOV+007<0x0d>

UPS: ^D006ACK<CRC H><CRC L><0x0d>

if UPS accepts this command, otherwise, responds ^D006NAK<CRC H><CRC L><0x0d>

Means: Calibration S Output voltage percent value; The range of the value is 0~10%.

7.6 ^C008TOV+007<0x0d>: calibration R output voltage

Computer: ^C008TOV+007<0x0d>

UPS: ^D006ACK<CRC H><CRC L><0x0d>

if UPS accepts this command, otherwise, responds ^D006NAK<CRC H><CRC L><0x0d>

Means: Calibration T Output voltage percent value; The range of the value is 0~10%.

7.7 ^C008ROC+007<0x0d>: calibration R output current

Computer: ^C008ROC+007<0x0d>

UPS: ^D006ACK<CRC H><CRC L><0x0d>

if UPS accepts this command, otherwise, responds ^D006NAK<CRC H><CRC L><0x0d>

Means: Calibration R Output current percent value; The range of the value is 0~12.5%.

7.8 ^C008SOC+007<0x0d>: calibration R output current

Computer: ^C008SOC+007<0x0d>

UPS: ^D006ACK<CRC H><CRC L><0x0d>

if UPS accepts this command, otherwise, responds ^D006NAK<CRC H><CRC L><0x0d>

Means: Calibration S Output current percent value; The range of the value is 0~12.5%.

7.9 ^C008TOC+007<0x0d>: calibration R output current

Computer: ^C008TOC+007<0x0d>

UPS: ^D006ACK<CRC H><CRC L><0x0d>

if UPS accepts this command, otherwise, responds ^D006NAK<CRC H><CRC L><0x0d>

Means: Calibration T Output current percent value; The range of the value is 0~12.5%.

7.10 ^C009RIVV+007<0x0d>:calibration r inverter voltage

Computer: ^C009RIVV+007<0x0d>

UPS: ^D006ACK<CRC H><CRC L><0x0d>

if UPS accepts this command, otherwise, responds ^D006NAK<CRC H><CRC L><0x0d>

Means: Calibration R inverter voltage percent value; The range of the value is 0~10%.

7.11 ^C009SIVV+007<0x0d>:calibration r inverter voltage

Computer: ^C009SIVV+007<0x0d>

UPS: ^D006ACK<CRC H><CRC L><0x0d>

if UPS accepts this command, otherwise, responds ^D006NAK<CRC H><CRC L><0x0d>

Means: Calibration S inverter voltage percent value; The range of the value is 0~10%.

7.12 ^C009TIVV+007<0x0d>:calibration r inverter voltage

Computer: ^C009TIVV+007<0x0d>

UPS: ^D006ACK<CRC H><CRC L><0x0d>

if UPS accepts this command, otherwise, responds ^D006NAK<CRC H><CRC L><0x0d>

Means: Calibration T inverter voltage percent value; The range of the value is 0~10%.

7.13 ^C009RBYV+007<0x0d>: calibration r bypass voltage

Computer: ^C009RBYV+007<0x0d>

UPS: ^D006ACK<CRC H><CRC L><0x0d>

if UPS accepts this command, otherwise, responds ^D006NAK<CRC H><CRC L><0x0d>

Means: Calibration R Bypass voltage percent value; The range of the value is 0~10%.

7.14 ^C009SBYV+007<0x0d>: calibration r bypass voltage

Computer: ^C009SBYV+007<0x0d>

UPS: ^D006ACK<CRC H><CRC L><0x0d>

if UPS accepts this command, otherwise, responds ^D006NAK<CRC H><CRC L><0x0d>

Means: Calibration S Bypass voltage percent value; The range of the value is 0~10%.

7.15 ^C009TBYV+007<0x0d>: calibration r bypass voltage

Computer: ^C009TBYV+007<0x0d>

UPS: ^D006ACK<CRC H><CRC L><0x0d>

if UPS accepts this command, otherwise, responds ^D006NAK<CRC H><CRC L><0x0d>

Means: Calibration T Bypass voltage percent value; The range of the value is 0~10%.

7.16 ^C010BUSPV+007<0x0d>:calibration positive bus voltage

Computer: ^C010BUSPV+007<0x0d>

UPS: ^D006ACK<CRC H><CRC L><0x0d>

if UPS accepts this command, otherwise, responds ^D006NAK<CRC H><CRC L><0x0d>

Means: Calibration positive BUS voltage percent value; The range of the value is 0~10%.

7.17 ^C010BUSNV+007<0x0d>:calibration positive bus voltage

Computer: ^C010BUSPN+007<0x0d>

UPS: ^D006ACK<CRC H><CRC L><0x0d>

if UPS accepts this command, otherwise, responds ^D006NAK<CRC H><CRC L><0x0d>

Means: Calibration negative BUS voltage percent value; The range of the value is 0~10%.

7.18 ^C010BATPV+007<0x0d>:calibration positive battery voltage

Computer: ^C010BATPV+007<0x0d>

UPS: ^D006ACK<CRC H><CRC L><0x0d>

if UPS accepts this command, otherwise, responds ^D006NAK<CRC H><CRC L><0x0d>

Means: Calibration positive battery voltage percent value; The range of the value is 0~10%.

7.19 ^C010BATNV+007<0x0d>:calibration positive battery voltage

Computer: ^C010BATNV+007<0x0d>

UPS: ^D006ACK<CRC H><CRC L><0x0d>

if UPS accepts this command, otherwise, responds ^D006NAK<CRC H><CRC L><0x0d>

Means: Calibration negative battery voltage percent value; The range of the value is 0~10%.