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Voltronic Power

UPS Communication Protocol

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1 Inquiry Command

1.1 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.

1.2 QMD<cr>: Model Inquiry

Computer: QMD<cr>

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

(a) UPS Model: TTTTTTTTTTTTTTTT

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>

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1.3 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 b0: bat silence

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			a0: Bat test fail a1: Bat test OK
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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.

1.4 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。
	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。

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	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,		
	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。		

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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。

(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.

(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
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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

1.5 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。

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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 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。

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a35	24	Parallel Capacity setting different	并机系统容量设置不一致。
a36	25	Parallel Auto Start Enable setting different	并机系统自动重启使能标志位设置不一致。
a37	26	Parallel Bypass Enable setting different	并机系统自动入旁路标志位设置不一致。
a38	27	Parallel Bat Protected Enable setting different	并机系统电池保护标志位设置不一致。
a39	28	Parallel Bat Open Check Enable setting different	并机系统电池连接侦测标志位设置不一致。
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 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

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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

1.6 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
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.

1.7 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

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1.8 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.

1.9 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.

1.10 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
c	Enable/disable code start
d	Enable/disable battery open status check
e	Enable/disable high efficiency mode
f	Enable/disable bypass forbiding
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

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	is over in battery mode.
l	Enable/disable Site fault detect
m	Set hot standby master/slave, PEM means master, PDM means slave
n	Enable/disable deep high efficiency mode
o	Enable/disable bypass when UPS turn off.
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
x	Enable/disable output parallel function in phase angle 0
y	Enable/disable phase auto adapt

1.11 QVFW<cr> : Main CPU Firmware version inquiry

Computer: QVFW<cr>

UPS: (VERFW: <NNNNN.NN><cr>

<n> is a HEX number from 0...9 or A...F.

Example:

Computer: QVFW<cr>

UPS: (VERFW: <00123.01><cr>

00123: firmware series number; 01: version.

1.12 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.

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f	TTT	Battery remain time	T is an Integer number 0 to 9. The units is minutes.
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1.13 QHE<cr>: High efficiency mode voltage range inquiry

Computer: QHE<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 voltage.
c	LLL	Voltage low loss point	L is an Integer number 0 to 9. The unit is voltage.

1.14 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.

1.15 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.

2 Control Command

2.1 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.

2.2 TL<cr>: Test until battery low

Computer: TL<cr>

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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.

2.3 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

2.4 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

2.5 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>

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.

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2.6 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)

2.7 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.

2.8 SON<cr>: Remote turn on UPS

Computer: SON<cr>

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

Means: Remote turn on UPS.

2.9 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.

2.10 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 .

2.11 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

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2.12 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,

2.13 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>

Means: Remote turn off UPS output socket.

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

3 Setting parameters Command

3.1 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>

X	Control setting
A	Enable/disable audible alarm
B	Enable/disable battery mode audible warning
C	Enable/disable code start
D	Enable/disable battery open status check
E	Enable/disable high efficiency mode
F	Enable/disable bypass forbidding
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	Set hot standby master/slave, PEM means master, PDM means slave

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N	Enable/disable deep high efficiency mode
O	Enable/disable bypass when UPS turn off.
P	Enable/disable bypass audible warning
Q	Enable/disable Constant Phase Angle function
R	Enable/disable auto-reboot.
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
X	Enable/disable output parallel function in phase angle 0
Y	Enable/disable phase auto adapt

3.2 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.

3.3 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

3.4 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>

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

3.5 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.

3.6 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

3.7 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.

X	Control setting
a	Enable/disable audible alarm
b	Enable/disable battery mode audible warning
c	Enable/disable code start
d	Enable/disable battery open status check
e	Enable/disable high efficiency mode

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f	Enable/disable bypass forbidding
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	Set hot standby master/slave, PEM means master, PDM means slave
n	Enable/disable deep high efficiency mode
o	Enable/disable bypass when UPS turn off.
p	Enable/disable bypass audible warning
q	Enable/disable Constant Phase Angle function
r	Enable/disable auto-reboot.
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
x	Enable/disable output parallel function in phase angle 0
y	Enable/disable phase auto adapt

Notes: 1 is enable, 0 is disable.

3.8 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

3.9 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.

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3.10 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.