Voltronic Power

 UPS Communication Protocol

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| Author： |  |  | Date： |  |
| Confirm： |       |  | Date： |       |
| Approve： |       |  | Date： |       |

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| No. | Version | Modify content | Author | Date | Confirm | Date |
| 1 | V00 | Original from Plus power, modify for A Plus power. | Horace | 2021-2-26 |  |  |
| 2 | V01 | QPI return PI44 instead of PI33 for A Plus Power | JCYang | 2021-04-01 |  |  |
| 3 | V02 | 1. 修改4.16 QVFW、4.17 QVFWEXT、4.18 QVFWN、4.19 QVFW2、4.20 QVFW2N之Version顯示描述更改為4位數
2. CHGC修改限制為01~180與LCD顯示一致
3. 新增SPW<nn><cr>，系統轉換模式時，各模塊轉換的間隔時間
4. 加回UPSBYP<cr>，Turn-on Bypass control
 | JCYang | 2021-05-11 |  |  |
| 4 | V03 | 1. 修改5.3 描述說明
2. 修改6.15 SEAF之<NN>描述說明
3. 新增6.17 SCVF預設值說明
4. 新增SISO 指令
5. 新增QISO查詢SISO設置指令
6. 新增QSPW(查詢SPW指令)
7. 修改6.25 BATTAH的範圍
8. 修改UPS Parallel Command為UPS Commad
9. 移除QPRI,SPR,SCB指令
10. 修改需要進入Parallel才需要下的指令內容
 | JCYang  | 2021-08-05 |  |  |
| 5 | V04 | 新增SSTSCTx, QSTSCT, SSTSCTDx, SPRxx, QPR, SPRDON, SPRDOFF指令說明 | JCYang | 2022-09-19 |  |  |
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**CATALOGUE**

# Document Description

## Goals

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

## 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. <ID> It’s means what’s power module ID number will be setting or query.
7. UPS respond with “(“ start, and with one space separate the data.

(exception: off-line Arista UPS)

1. 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.)
2. 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.).

# 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)

# Command supported by Software

# Inquiry Command

## QPI<cr>: Protocol ID Inquiry

Computer: QPI<cr>

UPS: (PI44<cr>

Function : To request the UPS Protocol ID.

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

Computer: QMD<cr>

UPS: (TTTTTTTTTTTTTTT WWWWWWW KKK P/P MMM NNN RR BB.B <cr>

* 1. 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: WWWWWWW

 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:

 K is an integer number ranging from 0 to 9.

 KKK is the percentage of power factor, for example: 100

 (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.

## Q3GS<cr>: The general status parameters inquiry for system data

## 4.3.1 Q3GSN,<ID><cr>: The general status parameters inquiry for each module data

Computer: Q3GS<cr>

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

Computer: Q3GSN,<ID><cr>

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

|  |  |  |  |
| --- | --- | --- | --- |
|  | Data | Description | Notes |
| a | ( | Start byte |  |
| b | MMM.M | R Input voltage | M is an Integer number 0 to 9. The units is V.  |
| b | MMM.M | S Input voltage | M is an Integer number 0 to 9. The units is V.  |
| b | MMM.M | T 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 | R Output voltage | L is an Integer number 0 to 9. The units is V. |
| d | LLL.L | S Output voltage | L is an Integer number 0 to 9. The units is V. |
| d | LLL.L | T 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 | QQQQ.Q | R Output current | Q is an Integer number from 0 to 9. The units is A.  |
| g | QQQQ.Q | S Output current | Q is an Integer number from 0 to 9. The units is A.  |
| g | QQQQ.Q | T Output current | Q is an Integer number from 0 to 9. The units is A.  |
| h | DDD | R 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.  |
| h | DDD | S 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.  |
| h | DDD | T 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.  |
| 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 | b9b8b7b6b5b4b3b2b1b0 a0a1 | Ups status | B9,b8: 00: standy;01: line-interactive;10: on-line.B7: Utility Failb6: Battery Lowb5: Bypass/Boost Activeb4: UPS Failedb3: EPOb2: Test in Progressb1: Shutdown Activeb0: silence a0: Bat test faila1: Bat test OK |

Example:

Computer: Q3GS<cr>

UPS: (220.2 220.4 220.3 50.0 220.2 220.3 220.4 50.0 0027.0 0029.0 0028.0 100 098 099 241.0
241.5 045.0 100011000000<cr>

 Computer: Q3GSN,01<cr>

UPS: (220.2 220.4 220.3 50.0 220.2 220.3 220.4 50.0 0027.0 0029.0 0028.0 100 098 099 241.0
241.5 045.0 100011000000<cr>

Means:

I/P R voltage is 220.2V.

I/P S voltage is 220.4V.

I/P T voltage is 220.3V.

I/P frequency is 50.0Hz

O/P R voltage is 220.2V

O/P S voltage is 220.3V

O/P T voltage is 220.4V

O/P frequency is 50.0Hz.

O/P R current is 27.0A

O/P S current is 29.0A

O/P T current is 28.0A

O/P R load 100%

O/P S load 98%

O/P T load 99%

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.

If there are not UPS module ID on line:

Computer: Q3GSN,03<cr>

UPS: (NAK<cr>

## QFS<cr>: Fault Status Inquiry for system data

## 4.4.1 QFSN,<ID><cr>: Fault Status Inquiry for each module data

If there are no UPS fail occur:

computer: QFS<cr>

UPS: (00<cr> (no fault)

computer: QFSN,01<cr>

UPS: (00<cr> (no fault)

If there are UPS fail occur:

Computer: QFS<cr>

UPS: (FF<cr>

Computer: QFSN,02<cr>

UPS: (FF<cr>

|  |  |  |
| --- | --- | --- |
| Code(FF) | Name | Definition |
| 0x01 | cBusSoftFault | BUS soft start failed |
| 0x02 | cBusOver | BUS voltage high |
| 0x03 | cBusUnder | BUS voltage low |
| 0x04 | cBusUnbalance | BUS voltage unbalanced |
| 0x06 | cPFCOverCurr | Converter over current |
| 0x11 | cInvSoftFault | Inverter soft start failed |
| 0x12 | cInvVoltHigh | Inverter voltage high |
| 0x13 | cInvVoltLow | Inverter voltage low |
| 0x14 | cL1InvShort | Phase A (Line to Neutral) output short circuited |
| 0x15 | cL2InvShort | Phase B (Line to Neutral) output short circuited |
| 0x16 | cL3InvShort | Phase C (Line to Neutral) output short circuited |
| 0x17 | cL1L2InvShort | Phase A-Phase B (Line to Line) output short circuited |
| 0x18 | cL2L3InvShort | Phase B-Phase C (Line to Line) output short circuited |
| 0x19 | cL3L1InvShort | Phase C-Phase A (Line to Line) output short circuited |
| 0x1A | cL1InvNegPow | Phase A output negative power fault |
| 0x1B | cL2InvNegPow | Phase B output negative power fault |
| 0x1C | cL3InvNegPow | Phase C output negative power fault |
| 0x23 | cInvRlyOpen | Inverter relay open circuited |
| 0x25 | cWiringFault | Line wiring fault |
| 0x31 | cCommCANFault | Parallel communication failed |
| 0x41 | cOverTempFault | Over temperature |
| 0x42 | cDSPCommFault | DSP communication failed |
| 0x43 | cOverloadFault | Heavy overload causes UPS fault |
| 0x45 | cChgrFault | As stated. |
| 0x46 | cModelFault | Incorrect UPS setting |
| 0x47 | cMcuCommFault | MCU communication failed |
| 0x49 | cIpOpPhaseError | Input and output phase error |
| 0x61 | cBypScrShort | Bypass SCR short circuited |
| 0x62 | cBypScrOpen | Bypass SCR open circuited |
| 0x63 | cRINVWaveAbnormal | Voltage waveform abnormal in R phase |
| 0x64 | cSINVWaveAbnormal | Voltage waveform abnormal in S phase |
| 0x65 | cTINVWaveAbnormal | Voltage waveform abnormal in T phase |
| 0x67 | cOpShort\_Byp | Bypass output short circuited |
| 0x68 | cOpLineShort\_Byp | Bypass output line to line short circuited |
| 0x69 | cInvScrShort | Inverter Relay short circuited |
| 0x6C | cBusVoltVaryFault | BUS voltage drop too fast |
| 0x6D | cCurrentDetectFault | Current sampling error value |
| 0x6E | cPFC\_INVOverCurFault | SPS Power fault |
| 0x6F | cBATFault | Battery polarity reverse |
| 0x71 | cPFCRIGBTFault | PFC IGBT over-current in R phase |
| 0x72 | cPFCSIGBTFault | PFC IGBT over-current in S phase |
| 0x73 | cPFCTIGBTFault | PFC IGBT over-current in T phase |
| 0x74 | cINVRIGBTFault | INV IGBT over-current in R phase |
| 0x75 | cINVSIGBTFault | INV IGBT over-current in S phase |
| 0x76 | cINVTIGBTFault | INV IGBT over-current in T phase |
| 0x77 | cISOOverTempFault | Isolation transformer over temperature |
| 0x79 | cModuleDisConnectFault | As stated. |

Example:

Computer: QFS<cr>

UPS: (01<cr>

Computer: QFSN,02<cr>

UPS: (01<cr>

If there are not UPS module ID on line:

Computer: QFSN,03<cr>

UPS: (NAK<cr>

## Q3WS<cr>: Warning Status Inquiry for system data

## 4.5.1 Q3WSN,<ID><cr>: Warning Status Inquiry for each module data

Computer: Q3WS<cr>

UPS: (a0a1……a20<cr>

Computer: Q3WSN,<ID><cr>

UPS: (a0a1……a20<cr>

a0,…,a20 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 | Code | Name | Definition |
| a0 | 0x00000001 | cEpoActive | EPO is Active |
| a1 | 0x00000002 | cOverLoadFail | Load is over load level and reach countdown delay |
| a2 | 0x00000004 | cCommCanFail | CAN bus is abnormal |
| a3 | 0x00000008 | cOverLoad | Load level is over Overload Alarm Level |
| a4 | 0x00000010 | cBatOpen | Battery is not connected. (Battery voltage is less than 9V) |
| a5 | 0x00000020 | cBatHigh | Battery is over 15V |
| a6 | 0x00000040 | cModuleUnLock | Module is not locked |
| a7 | 0x00000080 | cTurnOnAbornaml | Including:EPO is active,Maintain Bypass is active,DC start, But DC start setting is disableLine Status is not OK. (Voltage or Frequency is out of range, Phase sequence is not correct, Neutral Loss)SYNCHRO signal is abnormalTRIG0 signal is abnormal |
| a8 | 0x00000100 | cChgFail | Charger is abnormal |
| a9 | 0x00000200 | cEepromFail | Checksum value of Eeprom Data saved in MCU is not correct |
| a10 | 0x00000400 | cFanLock | Fan Locked |
| a11 | 0x00000800 | cLinePhaseErr | Line Phase sequence is not correct |
| a12 | 0x00001000 | cBypassPhaseErr | Bypass Phase sequence is not correct |
| a13 | 0x00002000 | cNLoss | Neutral is absent |
| a14 | 0x00004000 | cInternalInitialFail | Initial communication between DSP & MCU is abnormal |
| a15 | 0x00008000 | cCommSynSigFail | SYNCHRO signal is abnormal |
| a16 | 0x00010000 | cCommTRIG0Fail | TRIG0 signal is abnormal |
| a17 | 0x00020000 | cRedundancySetFail | Power Module number is not consistent with setting |
| a18 | 0x00040000 | cParaSysConfigWrong | No STS in system |
| a19 | 0x00080000 | cMaintainBypass | Maintain Bypass is active |
| a20 | 0x00100000 | cParaRackCableLoosenWR | Parallel Cable loose |

Example:

Computer: Q3WS<cr>

UPS: (10000000000000000000<cr>

Computer: Q3WSN,02<cr>

UPS: (10000000000000000000<cr>

Means: EPO is Active

If there are not UPS module ID on line:

Computer: Q3WSN,03<cr>

UPS: (NAK<cr>

## QMOD<cr>: UPS Mode inquiry for system data

## 4.6.1 QMODN,<ID><cr>: UPS Mode inquiry for each module data

Computer: QMOD<cr>

UPS: (M<cr>

Computer: QMODN,01<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>

Computer: QMODN,02<cr>

UPS: (Y<cr>

means: the current UPS mode is bypass mode.

If there are not UPS module ID on line:

Computer: QMODN,03<cr>

UPS: (NAK<cr>

## QRI<cr>: UPS Rating Information inquiry

Computer: QRI<cr>

UPS: (MMM.M QQQQ 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 : QQQQ

c. Battery Voltage: SSS.S.

d. Rating Output Frequency : RR.R

## Q3YV<cr>: The bypass three phase voltage inquiry for system data

## 4.8.1 Q3YVN,<ID><cr>: The bypass three phase voltage inquiry for each module data

Computer：Q3YV<cr>

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

Computer: Q3YVN,01<cr>

UPS: (RRR.R SSS.S TTT.T<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. |

Example:

Computer: Q3YV<cr>

UPS: (220.2 215.3 222.1<cr>

Computer: Q3YVN,03<cr>

UPS: (220.2 215.3 222.1<cr>

Means:

R voltage of bypass is 220.2V.

S voltage of bypass is 215.3V.

T voltage of bypass is 222.1V.

If there are not UPS module ID on line:

Computer: Q3YVN,03<cr>

UPS: (NAK<cr>

## 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.

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

Computer：Q3YC<cr>

UPS: (RRRR.R SSSS.S TTTT.T<cr>

|  |  |  |  |
| --- | --- | --- | --- |
|  | Data | Description | Notes |
| a | ( | Start byte |  |
| b | RRRR.R | R current | R is an Integer number 0 to 9. The units is A. |
| c | SSSS.S | S current | S is an Integer number 0 to 9. The units is A. |
| d | TTTT.T | T current | T is an Integer number 0 to 9. The units is A. |

Example:

Computer: Q3YC<cr>

UPS: (0045.2 0044.3 0045.1<cr>

Means:

R current is 45.2A.

S current is 44.3A.

T current is 45.1A.

## Q3LD<cr>: The three phase load inquiry for system data

## 4.11.1 Q3LDN,<ID><cr>: The three phase load inquiry for each module data

Computer：Q3LD<cr>

UPS: (RRR SSS TTT AAA<cr>

Computer: Q3LDN,<ID><cr>

UPS: (RRR SSS TTT AAA <cr>

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

Example:

Computer: Q3LD<cr>

UPS: (045 042 047 050<cr>

Computer: Q3LDN,01<cr>

UPS: (045 042 047 050<cr>

Means:

R phase of load is 45%.

S phase of load is 42%.

T phase of load is 47%.

The whole load is 50%

If there are not UPS module ID on line:

Computer: Q3LDN,03<cr>

UPS: (NAK<cr>

## 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.

## 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.

## QPAR<cr>: UPS parallel number inquiry

Computer：QPAR<cr>

UPS: (nn rr<cr> nn=01……99 rr=01……99

nn is the parallel number.
 rr is the setting redundant number.

Example:

Computer: QPAR<cr>

UPS: (03 01<cr>

Means: There are three modules on the line and setting the redundant number to one unit.

## 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 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-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 self test  |

## QVFW<cr>: STS Firmware version inquiry

Computer: QVFW<cr>

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

<m> are 4 characters, represent firmware series number;

<n> can be 2 characters, represent version;

Example:

Computer: QVFW<cr>

UPS: (STS\_FW: 0000.01<cr>

00: firmware series number；

01: version.

## QVFWEXT<cr>: Extra Comm Firmware version inquiry

Computer: QVFWEXT<cr>

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

<m> are 4 characters, represent firmware series number;

<n> can be 2 characters, represent version;

Example:

Computer: QVFWEXT<cr>

UPS: (EXTRA\_COMM\_FW: 0000.01<cr>

00: firmware series number；

01: version.

## QVFWN,<ID><cr>: Main CPU Firmware version inquiry for each module data

Computer: QVFWN,<ID><cr>

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

<m> are 4 characters, represent firmware series number;

<n> can be 2 characters, represent version;

Example:

Computer: QVFWN,03<cr>

UPS: (PFC\_FW: 0000.01<cr>

00: firmware series number；

01: version.

If there are not UPS module ID on line:

Computer: QVFWN,03<cr>

UPS: (NAK<cr>

## QVFW2<cr>: LCD Firmware version inquiry

Computer: QVFW2<cr>

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

<m> are 4 characters, represent firmware series number;

<n> can be 2 characters, represent version;

Example:

Computer: QVFW2<cr>

UPS: (PANEL\_FW:0000.01<cr>

00: firmware series number；

01: version.

## QVFW2N,<ID><cr>: the second CPU Firmware version inquiry for each module data

Computer: QVFW2N,<ID><cr>

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

<m> are 4 characters, represent firmware series number;

<n> can be 2 characters, represent version;

Example:

Computer: QVFW2N,03<cr>

UPS: (INV\_FW: 0000.01<cr>

00: firmware series number；

01: version.

If there are not UPS module ID on line:

Computer: QVFW2N,03<cr>

UPS: (NAK<cr>

## QID<cr>: The UPS ID inquiry for system data

## 4.20.1 QIDN,<ID><cr>: The UPS ID inquiry for each module data

Computer：QID<cr>

UPS: (ABCDEEFFGXXXXX<cr>

Computer: QIDN,<ID><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>

UPS: (88461403100001<cr>

Computer: QIDN,01<cr>

UPS: (85321403100001<cr>

If there are not UPS module ID on line:

Computer: QIDN,03<cr>

UPS: (NAK<cr>

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

Computer：QBV<cr>

UPS: (RRR.R NN MMM CCC TTT CCC.C<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 | MMM | Battery nominal capacity(Ah) | MMM is an Integer number 01 to 999. |
| 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. |
| CCC.C | Charge current | CCC.C is charge current |  |

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

Computer：QNBV<cr>

UPS: (RRR.R NN MMM CCC TTT CCC.C<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 | MMM | Battery nominal capacity(Ah) | MMM is an Integer number 01 to 999. |
| 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. |
| CCC.C | Charge current | CCC.C is charge current |  |

## QLDL<cr>: Load level inquiry for system data

## 4.23.1 QLDLN,<ID><cr>: Load level inquiry for each module data

Computer: QLDL<cr>

UPS: (RRR SSS TTT XXX YYY ZZZ<cr>

Computer: QLDLN,<ID><cr>

UPS: (RRR SSS TTT XXX YYY ZZZ<cr>

|  |  |  |  |
| --- | --- | --- | --- |
|  | Data | Description | Notes |
| a | ( | Start byte |  |
| b | RRR | R Watt percent | R is an Integer number 0 to 9. The unit is %. |
| C | SSS | S Watt percent | S is an Integer number 0 to 9. The unit is %. |
| D | TTT | T Watt percent | T is an Integer number 0 to 9. The unit is %. |
| E | XXX | R VA percent | X is an Integer number 0 to 9. The unit is %. |
| F | YYY | S VA percent | Y is an Integer number 0 to 9. The unit is %. |
| g | ZZZ | T VA percent | Z is an Integer number 0 to 9. The unit is %. |

Example:

Computer: QLDL<cr>

UPS: (050 048 030 050 048 030<cr>

Computer: QLDLN,01<cr>

UPS: (050 048 030 050 048 030<cr>

Means:

R phase of load is 50%.(Watt)

S phase of load is 48%.(Watt)

T phase of load is 30%.(Watt)

R phase of load is 50%.(VA)

S phase of load is 48%.(VA)

T phase of load is 30%.(VA)

If there are not UPS module ID on line:

Computer: QLDL,03<cr>

UPS: (NAK<cr>

## 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. |

## 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. |

## QOPF<cr>: The output power factor inquiry for system data

## 4.27.1 QOPFN,<ID><cr>: The output power factor inquiry for each module data

Computer: QOPF <cr>

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

Computer: QOPFN,<ID><cr>

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

|  |  |  |  |
| --- | --- | --- | --- |
|  | Data | Description | Notes |
| a | ( | Start byte |  |
| b | R.RRR | R output power factor | R is an Integer number 0 to 9. |
| c | S.SSS | S output power factor | S is an Integer number 0 to 9.  |
| d | T.TTT | T output power factor | T is an Integer number 0 to 9. |

Example:

Computer: QOPF<cr>

UPS: (0.998 0.997 0.999<cr>

Computer: QOPFN,01<cr>

UPS: (0.998 0.997 0.999<cr>

Means:

R phase of power factor is 0.998.

S phase of power factor is 0.997.

T phase of power factor is 0.999.

If there are not UPS module ID on line:

Computer: QOPFN,03<cr>

UPS: (NAK<cr>

## QSR<cr>: Get shutdown and restore count down time

Computer: QSR<cr>

UPS: (SSSS RRRRR<cr>

SSSS: count down time of shutdown Unit: second

RRRR: count down time of restore Unit: second

Example:
Computer: QSR <cr>
UPS: (0059 00060<cr>

## QBTD <cr>: Get battery test stop time , capacity and voltage

Computer: QBTD <cr>

UPS: (TTTT CCC VV.VV<cr>

TTTT: Bat test stop time Unit: second

CCC: Bat test stop capacity Unit:%

VV.VV: Bat test stop voltage Unit: Volt/PCS

Example:
Computer: QBTD <cr>
UPS: (0060 80 10.20<cr>

## QREPO <cr>: EPO function normal open or close inquiry

Computer: QREPO <cr>

UPS: (N<cr>

Example:
UPS: (OPEN<cr> (If UPS set normal open active )

UPS: (CLOSE<cr> (If UPS set normal close active)

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

## QBDR<cr>: The baud rate inquiry

Computer: QBDR<cr>
UPS:(NN MM<cr>

NN is 24, 48, and 96. It means comport0 baud rate is 2400, 4800 and 9600.
MM is 24, 48, and 96. It means comport1 baud rate is 2400, 4800 and 9600.

## QTPR<cr>: The temperature inquiry for system data

## 4.32.1 QTPRN,<ID><cr>: The temperature inquiry for each module data

Computer: QTPR<cr>

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

Computer: QTPRN,<ID><cr>

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 | SSS.S | temperature2 | S is an Integer number 0 to 9. The units is ℃. |
| d | HHH.H |  temperature3 | H is an Integer number 0 to 9. The units is ℃. |
| e | LLL.L |  temperature4 | L is an Integer number 0 to 9. The units is ℃. |

For example:

Computer：QTPR<cr>

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

Computer：QTPRN,03<cr>

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

Means:

The first temperature check point is 32.0℃；

There is no the fourth temperature check points

If there are not UPS module ID on line:

Computer: QTPR,02<cr>

UPS: (NAK<cr>

## QCHGC<cr>: Setting Charging current inquiry

Computer: QCHGC<cr>

UPS: (CHGC<nnn><cr> nnn is from 000 to 128

## QV<cr>: Output voltage setting value inquiry

Computer: QV<cr>

UPS: (V220<cr>

Means: Output is setting to 220V.

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

Computer: QBCO<cr>

UPS: (A.AA BB.BB CC.CC DD<cr>

A.AA: Battery Cut-off minimum voltage per cell,

BB.BB: Cut off voltage per PCS,

CC.CC: Battery low voltage per PCS.
DD: Battery low capacity(%)

EE: Battery shutdown capacity(%)

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

Computer：QBTAH<cr>

Device: (RRR<cr>

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

## 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

For example

Computer: QPST<cr>

UPS: (PST:07<cr>

## QMF<cr>: The Manufacturer Inquiry

Computer：QMF<cr>

Device: (MMMMMMMMMMMMMMMMMMMMMMMMMM<cr>

The whole length of manufacturer name is 26 ASCII characters, if the manufacturer name less than 26 ASCII character, please enter ‘#’ before the UPS manufacturer name.

For example:

Computer: QMF<cr>

Device: (###########Voltronic Power<cr>

## QTIME<cr>: Current Time Inquiry

Computer：QTIME<cr>

Device: (YYYY MM DD HH MM SS <cr>

Device sends current time information from real time clock.

YYYY = four ASCII digits indicating current year

MM = two ASCII digits indicating current month

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

## QSID <cr>: The system maintenance date inquiry

Computer：QSID<cr>

Device: (YYYY MM DD<cr>

YYYY: The Year
MM: The Month
DD: The day

Example:
Computer:QSID<cr>
UPS: (2013 09 16<cr>

##  QSMD <cr>: The system maintenance date inquiry

Computer：QSMD <cr>

Device: (YYYY MM DD<cr>

YYYY: The Year
MM: The Month
DD: The day

Example:
Computer: QSMD <cr>
UPS: (2013 09 16<cr>

##  QBID <cr>: The battery installed date inquiry

Computer：QBID <cr>

Device: (YYYY MM DD<cr>

YYYY: The Year
MM: The Month
DD: The day

Example:
Computer: QBID <cr>
UPS: (2013 09 16<cr>

##  QBMD <cr>: The battery installed date inquiry

Computer：QBMD <cr>

Device: (YYYY MM DD<cr>

YYYY: The Year
MM: The Month
DD: The day

Example:
Computer: QBMD <cr>
UPS: (2013 09 16<cr>

##  QMID <cr>: On line module ID number inquiry

 Example:

Computer：QMID <cr>(If module ID number 01 03 05 07 on line)

UPS: (01 03 05 07 <cr>

Computer: QMID <cr>(If there is not any module on line)
UPS: (NAK<cr>

## QEVENT<cr>: History event inquiry Computer：QEVENT<cr>

(HV STS Firmware up to 10.00 or LV STS Firmware up to 09.00 )

 Device: (NNN YYYY MM DD HH MM SS DD<cr>

(HV STS Firmware under to 10.00 or LV STS Firmware under to 09.00 )

 Device: (NN YYYY MM DD HH MM SS DD<cr>

|  |  |  |
| --- | --- | --- |
| Data | Description | Notes |
| ( | Start byte |  |
| NNN | Fault code or warning code Number | 01~148(Reference Table1) |
| YYYY | The year |  |
| MM | The month |  |
| DD | The date |  |
| HH | The hour |  |
| MM | The minute |  |
| SS | The second |  |
| DD | Module ID number | 99 is system |

Example:

Computer：QEVENT <cr>

UPS: (001 2014 03 05 07 36 42 01<cr>

Means: Module ID:01 detect BUS voltage is over 450V on 2014/03/05 07:36:42

UPS: (37 2014 03 05 07 36 42 07<cr>

Means: Module ID:07 detect EPO is active on 2014/03/05 07:36:42

## QSNIDL<cr>: The Customer ID inquiry for STS data of length

## QSNIDLN,<ID><cr>: The Customer ID inquiry for each module data of length

Computer: QSNIDL <cr>

UPS: (XX<cr>

Computer: QSNIDLN,<ID><cr>

UPS: (XX<cr>

XX is length

Example:

1. Computer: QSNIDL<cr>

UPS: (00<cr>

00: This means that the serial number to be get by the QID<cr>

1. Computer: QSNIDL<cr>

 UPS: (16<cr>

 16: This means that the serial number of length is 16 Character. The serial number to be get
 by the QSNID<cr>

1. Computer: QSNIDLN ,03<cr>

UPS: (00<cr>

00: This means that the serial number to be get by the QIDN,03<cr>

1. Computer: QSNIDLN ,03<cr>

 UPS: (16<cr>

 16: This means that the serial number of length is 16 Character. The serial number to be get
 by the QSNIDN,03<cr>

## QSNID<cr>: The UPS ID inquiry for system data

## 4.48.1 QSNIDN,<ID><cr>: The UPS ID inquiry for each module data

1. Computer：QSNID <cr>

 If QSNIDL response 00

 UPS: (NAK<cr>

1. Computer：QSNID <cr>

 If QSNIDL response 16

 UPS: (XXXXXXXXXXXXXXXX<cr> A total of 16 characters 16 Character

1. Computer：QSNIDN,03 <cr>

 If QSNIDL response 00

 UPS: (NAK<cr>

1. Computer：QSNIDN,03 <cr>

 If QSNIDL response 16

 UPS: (XXXXXXXXXXXXXXXX<cr> A total of 16 characters 16 Character

# Control Command

## 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.

## 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.

## T<nn>,T<.n><cr>: Test for specified time(Above 1min or Below 1min) Computer: T<nn>,T<.n><cr>

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

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

**Means: Test for <nn> more than 1 minute; Test for <.n> n = (0~9)\*6**

## 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

## 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.

## 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)

## 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.

## 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.

## 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.

## 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 .

## 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

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

# Setting parameters Command

## 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  |
| **C** | Enable/disable code start  |
| **E** | Enable/disable high efficiency mode |
| **F** | Enable/disable bypass forbidding  |
| **O** | Enable/disable bypass when UPS turn off. |
| **R** | Enable/disable auto-reboot.  |
| **V** | Enable/disable converter mode  |
| **W** | Enable/disable limited runtime on battery mode, |
| **Z** | Enable/disable period self test |
|  |  |

## PSF<m><cr>: Set bypass frequency high loss point and low loss point

Computer: PSF<m><cr>

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

In 50Hz system and 60Hz system, <m> is a 1 2 or 4, default -4Hz and +4Hz; the precision is 0.1Hz;

Example:

Computer: PSF1<cr>

UPS: (ACK<cr>

Means: In 50Hz system, the bypass frequency low loss point has been set to 49Hz and the bypass frequency high loss point has been set to 51Hz

Computer: PSF2<cr>

UPS: (ACK<cr>

Means: In 60Hz system, the bypass frequency low loss point has been set to 58Hz and the bypass frequency high loss point has been set to 62Hz

## 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 precent ranging have 10% 20% and 30%, default 20% for HV system.

<p> is a precent ranging have 10% 20%, default 20% for LV system.

For example:

Computer: PLV10<cr>

UPS: (ACK<cr>

Means: Set the bypass voltage low loss point to 220 \* 0.9 = 198V.(Output is setting to 220V)

## 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 precent ranging have 10% 15% and 20%, default 15% for HV system

<q> is a precent ranging have 10% 15%, default 15% for LV system

For example:

Computer: PHV10<cr>

UPS: (ACK<cr>

Means:Set the bypass voltage high loss point to 220 \* 1.1 = 242V.

## 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.

1. Setting bypass frequency low loss point to output - 4.0Hz.
2. Setting bypass frequency high loss point to output + 4.0Hz.
3. Setting bypass voltage low loss point to 176V.
4. Setting bypass voltage high loss point to 264V.

## 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.

## SSTN<TT:RR><cr>: Setting the system total module number and redundancy number

Computer: SSTN <TT:RR><cr>

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

TT: Total module number
RR: Redundancy module number

Example:

Computer: SSTN03:01<cr>

UPS: (ACK<cr>

## SBDT<NNNN><cr>: Setting the battery shut down delay time

Computer: SBDT <TT:RR><cr>

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

NNNN: Unit is second(The range is 0~0999)

Example:

Computer: SBDT0999<cr>

UPS: (ACK<cr>

 Means: After 999 minute shutdown in battery mode.

## SBLV <NN.NN><cr>: Setting the battery low voltage

Computer: SBLV < NN.NN ><cr>

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

NN.NN: Unit is V/pcs. (The range is 10.5V~11.5V)

Example:

Computer: SBLV10.52<cr>

UPS: (ACK<cr>

 Means: The battery low voltage is 10.50V.

## SBLC <NN><cr>: Setting the battery low capacity

Computer: SBLC<NN><cr>

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

NN: Unit is % (The range is 20%~50%)

Example:

Computer: SBLC20<cr>

UPS: (ACK<cr>

 Means: The battery low capacity is 20%.

## ~~SBSC <NN><cr>: Setting the battery shutdown capacity~~

~~Computer: SBSC<NN><cr>~~

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

~~NN: Unit is %~~

~~Example:~~

~~Computer: SBSC10<cr>~~

~~UPS: (ACK<cr>~~

 ~~Means: The battery shutdown capacity is 10%.~~

## SBTSV <NN.NN><cr>: Setting the battery test stop voltage

Computer: SBTSV <NN.NN><cr>

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

NN.NN: Unit is V/pcs. (The range is 11V ~ 12V)

Example:

Computer: SBTSV10.50<cr>

UPS: (ACK<cr>

 Means: When the system turn to battery test mode, the stop voltage is 10.50V / pcs.

## SBTSC <NN><cr>: Setting the battery test stop capacity

Computer: SBTSC <NN><cr>

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

NN: Unit is % (The range is 20% ~ 50%)

Example:

Computer: SBTSC20<cr>

UPS: (ACK<cr>

 Means: When the system turn to battery test mode ,the stop capacity is 20%.

## SBTST<NNN><cr>: Setting the battery test stop time

Computer: SBTST <NNN><cr>

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

NNN: Unit is second(The range is 000~999)

Example:

Computer: SBTST999<cr>

UPS: (ACK<cr>

 Means: When the system turn to battery test mode ,the stop time is 999 second.

## SEAF <NN><cr>: Setting the EPO function

Computer: SEAF <NNN><cr>

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

NN: If NN is 00, the EPO function in normal open. If NN is 0**1**, the EPO function in normal close.

Example:

Computer: SEAF01<cr>

UPS: (ACK<cr>

 Means: When the EPO contact point is open , the system will shutdown.

## UPSBYP<cr>: UPS turn to bypass

Computer: UPSBYP <cr>

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

Example:

Computer: UPSBYP <cr>

UPS: (ACK<cr>

 Means: When bypass setting to enable and UPS on line mode. UPS will turn to bypass mode.

## SCVF <nn><cr>: Set converter mode output frequency

Computer: SCVF<nn><cr>

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

nn = 50 or 60

Example:

Computer: SCVF50<cr>

UPS: (ACK<cr>

 Means: When the converter mode is setting to enable, normal output frequency will be 50Hz

 **System default 50Hz.**

## SCOF <nn><cr>: Set charger On / Off

Computer: SCOF<nn><cr>

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

nn = 00 or 01

Example:

Computer: SCOF00<cr>

UPS: (ACK<cr>

 Means: Charger is turn off

## 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.

## ID <ABCDEEFFGXXXXX><cr>: Setting UPS ID for system data

## 6.21.1 ID, <ID><ABCDEEFFGXXXXX><cr>: Setting UPS ID for each module data

Computer: ID< ABCDEEFFGXXXXX ><cr>

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

Computer: ID,01< 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>

Computer: ID,0183320903100001<cr>

UPS: (ACK<cr>

If there are not UPS module ID on line:

Computer: ID,0183320903100001<cr>

UPS: (NAK<cr>

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

mputer: 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.

## 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 220,230,240 for HV system.

Output Voltage: <n>. n is 120,127 for LV system.

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

For example:

Computer: V230<cr>

UPS: (ACK<cr>

Means: set output nominal voltage to 230V.

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

Computer: CHGC <nnn><cr>

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

nn is form 001 to 180.

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

Computer: BATCO<nn.nn> <cr> n.nn= 10.00~11.00

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

Example:

 Computer: BATCO10.00<cr>

 UPS: (ACK<cr>

Means: The battery minimum cut-off voltage is 10.00V/pcs

## BATTAH<nnn><cr>: Setting battery Total AH

Computer: BATTAH<nnn><cr>

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

nnn is from 009 to 999, unit: AH

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

## 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.

## 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

## SSID < YYYYMMDD ><cr>: Setting the system installed date

Computer: SSID < YYYYMMDD ><cr>

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

YYYY :The Year
MM :The Month
DD :The day

Example:

Computer: SSID20130914<cr>

UPS: (ACK<cr>

 Means: The system installed date is 2013/09/14

## SSMD < YYYYMMDD ><cr>: Setting the system maintenance date

Computer: SSMD < YYYYMMDD ><cr>

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

YYYY :The Year
MM :The Month
DD :The day

Example:

Computer: SSMD20130914<cr>

UPS: (ACK<cr>

 Means: The system maintenance date is 2013/09/14

## SBID < YYYYMMDD ><cr>: Setting the battery installed date

Computer: SBID < YYYYMMDD ><cr>

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

YYYY :The Year
MM :The Month
DD :The day

Example:

Computer: SBID20130914<cr>

UPS: (ACK<cr>

 Means: The battery installed date is 2013/09/14

## SBMD < YYYYMMDD ><cr>: Setting the battery maintenance date

Computer: SBMD < YYYYMMDD ><cr>

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

YYYY :The Year
MM :The Month
DD :The day

Example:

Computer: SBMD20130914<cr>

UPS: (ACK<cr>

 Means: The battery maintenance date is 2013/09/14..

## SPW<nn><cr>: Setting each module interval time when system mode transfer.

Computer: SPW <nn ><cr>

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

nn : 01~10

Computer: SPW01<cr>

UPS: (ACK<cr>

## SISO<n><cr>: Setting ISO Voltage Compensation function for Cold Start.

Computer: SISO <n ><cr>

UPS: (ISO Enable<cr> if ISO Voltage Compensation =1, otherwise, responds (ISO Disable<cr>

n: 0 or 1;

Computer: SISO1<cr>

UPS: (ISO Enable<cr>

Computer: SISO0<cr>

UPS: (ISO Disable)<cr>

## QISO<cr>: Reading ISO Voltage Compensation function for Cold Start.

Computer: QISO<cr>

UPS: (ISO Status: ON<cr> if ISO Voltage Compensation =1, otherwise, responds (ISO Status: OFF<cr>

Computer: Setting SISO1🡺QSISO<cr>

UPS: (ISO Status: ON<cr>

## QSPW<cr>: Reading function of Power Walk In Setting.

Computer: QSPW <cr>

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

Computer: Setting SPW07🡺QSPW

UPS: (07<cr>

## QSID<ID> <cr>: The rack installed date inquiry

Computer：QSID<ID><cr>

Device: (YYYY MM DD<cr>

ID: 08 or 17. It means set rack1 or rack2 install date.

YYYY: The Year
MM: The Month
DD: The day

Example:
Computer:QSID08<cr>
UPS: (2013 09 16<cr>

## QSMD <ID> <cr>: The system maintenance date inquiry

Computer：QSMD<ID> <cr>

Device: (YYYY MM DD<cr>

ID: 08 or 17. It means set rack1 or rack2 install date.

YYYY: The Year
MM: The Month
DD: The day

Example:
Computer: QSMD 17<cr>
UPS: (2013 09 16<cr>

##  QBID<ID> <cr>: The battery installed date inquiry

Computer：QBID<ID> <cr>

Device: (YYYY MM DD<cr>

ID: 08 or 17. It means set rack1 or rack2 install date.

YYYY: The Year
MM: The Month
DD: The day

Example:
Computer: QBID08 <cr>
UPS: (2013 09 16<cr>

##  QBMD<ID><cr>: The battery installed date inquiry

Computer：QBMD<ID> <cr>

ID: 08 or 17. It means set rack1 or rack2 install date.

Device: (YYYY MM DD<cr>

YYYY: The Year
MM: The Month
DD: The day

Example:
Computer: QBMD 17<cr>
UPS: (2013 09 16<cr>

## QRBAT<X><cr>: The rack1 and rack2 battery information inquiry

Computer：QRBAT1<cr>

UPS: (RRR.R SSS.S NN MMM CCC TTT CC.CC AA.AA<cr>

|  |  |  |  |
| --- | --- | --- | --- |
|  | Data | Description | Notes |
| a | ( | Start byte |  |
| b | RRR.R | Positive Battery voltage | R is an Integer number 0 to 9. The units is V. |
| c | SSS.S | Negative Battery voltage | S is an Integer number 0 to 9. The units is V. |
| d | NN | Battery piece number | NN is from 01 to 20. |
| e | MMM | Battery nominal capacity(Ah) | MMM is an Integer number 01 to 999. |
| f | CCC | Battery capacity | CCC is an Integer number 000 to 100. |
| g | TTT | Battery remain time | T is an Integer number 0 to 9. The units is minutes. |
| h | CC.CC | Positive Charge current | CC.CC is total charge current |
| i | AA.AA | Negative Charge current | AA.AA is total charge current |

## SSID<ID> < YYYYMMDD ><cr>: Setting the rack installed date

Computer: SSID<ID>< YYYYMMDD ><cr>

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

ID: 08 or 17. It means set rack1 or rack2 install date.

YYYY :The Year
MM :The Month
DD :The day

Example:

Computer: SSID0820130914<cr>

UPS: (ACK<cr>

 Means: The rack1 installed date is 2013/09/14

## SSMD <ID>< YYYYMMDD ><cr>: Setting the system maintenance date

Computer: SSMD < YYYYMMDD ><cr>

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

ID: 08 or 17. It means set rack1 or rack2 install date.

YYYY :The Year
MM :The Month
DD :The day

Example:

Computer: SSMD20130914<cr>

UPS: (ACK<cr>

 Means: The rack1 maintenance date is 2013/09/14

## SBID<ID> < YYYYMMDD ><cr>: Setting the battery installed date

Computer: SBID <ID>< YYYYMMDD ><cr>

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

ID: 08 or 17. It means set rack1 or rack2 install date.

YYYY :The Year
MM :The Month
DD :The day

Example:

Computer: SBID20130914<cr>

UPS: (ACK<cr>

 Means: The battery installed date is 2013/09/14

## SBMD <ID>< YYYYMMDD ><cr>: Setting the battery maintenance date

Computer: SBMD <ID>< YYYYMMDD ><cr>

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

ID: 08 or 17. It means set rack1 or rack2 install date.

YYYY :The Year
MM :The Month
DD :The day

Example:

Computer: SBMD20130914<cr>

UPS: (ACK<cr>

 Means: The battery maintenance date is 2013/09/14..

##  STS CT Ratio Value Setting

Computer: SSTSCTx<cr>

UPS (**APLUS Model**):

If x = 0 🡪 (300KVA STS CT Ratio Set! <cr>

Means: 300kVA STS CT Ratio is set.

If x = 1 🡪 (420KVA STS CT Ratio Set! <cr>

Means: 420kVA STS CT Ratio is set.

If x = 2 🡪 (600KVA STS CT Ratio Set! <cr>

Means: 600kVA STS CT Ratio is set.

UPS (**APLUS-480V Model**):

If x = 0 🡪 (350KVA STS CT Ratio Set! <cr>

Means: 350kVA STS CT Ratio is set.

If x = 1 🡪 (700KVA STS CT Ratio Set! <cr>

Means: 700kVA STS CT Ratio is set.

UPS (**FORTRESS Model**):

If x = 0 🡪 (120KVA STS CT Ratio Set! <cr>

Means: 120kVA STS CT Ratio is set.

If x = 1 🡪 (200KVA STS CT Ratio Set! <cr>

Means: 200kVA STS CT Ratio is set.

Note. If x is not equal to 0, 1 or 2, UPS will replies “(Operation Error…<cr>”message.

#### Read STS CT Ratio Value

Computer: QSTSCT<cr>

UPS:

(STS CT Ratio: xxxKVA<cr>

Means: xxx represents STS’s CT ratio value. It will be 120, 200, 300, 350, 420, 600, 700, etc., depending on what machine model is and what CT ratio will be set.

## STS CT Ratio Value Display Enable/Disable Setting

Computer: SSTSCTDx<cr>

UPS:

If x = 0 🡪 (STS CT Ratio Display OFF!<cr>

Means: Turning off STS CT Ratio Value Display on Information page of LCD.

If x = 1 🡪 (STS CT Ratio Display ON!<cr>

Means: Turning on STS CT Ratio Value Display on Information page of LCD.

## Module Power Rating Value Setting (ONLY FOR DISPLAY)

Computer: SPRxx<cr>

UPS: (xxKVA Power Rating Set!<cr>

Means: xxkVA single module power rating value (ONLY FOR DISPLAY) is set.

Note. The range of xx is 0~99. UPS will replies “(Operation Error…<cr>”message if out of the range.

#### Read Module Power Rating Value (ONLY FOR DISPLAY)

Computer: QPR<cr>

UPS: (Power Rating: xxKVA<cr>

Means: xxkVA single module power rating value (ONLY FOR DISPLAY) is read.

## Module Power Rating Value Display Enable Setting

Computer: SPRDON<cr>

UPS: (Power Rating Display ON! <cr>

Means: Turning on Module Power Rating Value Display on Main page of LCD.

Computer: SPRDOFF<cr>

UPS: (Power Rating Display OFF! <cr>

Means: Turning off Module Power Rating Value Display on Main page of LCD.

======UPS Command====

1. 新增Warning
2. CHGC<XX><cr> -> CHGC<XXX><cr> QCHGC改為3位數~版本為3.00之後
3. Q3GS QRI Q3GSN Q3YC Q3OC Q3OCN的電流改為QQQQ.Q 版本為3.00之後
4. **修正無須透過指令QPRI .才需要用到以下的指令**

QRBAT, QSID<ID>,QSMD<ID>, QBID<ID>, QBMD<ID>, SSID<ID><YYYYMMDD>

SSMD<ID><YYYPYMMDD>, SBID<ID><YYYYMMDD>, SBMD<ID><YYYYMMDD>,

1. 修改4.16 QVFW、4.17 QVFWEXT、4.18 QVFWN、4.19 QVFW2、4.20 QVFW2N之Version顯示描述更改為4位數
2. CHGC修改限制為01~180與LCD顯示一致
3. 新增SPW<nn><cr>，系統轉換模式時，各模塊轉換的間隔時間
4. 加回UPSBYP<cr>，Turn-on Bypass control
5. 修改5.3協議可測試的參數設定
6. 修改6.15 SEAF normal close的描述
7. 增加6.17 SCVF系統預設頻率描述
8. 修改6.25 BATTAH範圍009 ~ 999
9. 新增6.33 SISO 在Cold Start情形增加變壓器負載回應Fault的訊息
10. 新增6.34 QISO 查詢SISO指令設置狀態
11. 新增6.35 QSPW查詢SPW參數設置的指令