UPS Protocol
UniStar V

COMMANDS TABLE

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31	PLV<p>	Set bypass voltage low loss point
32	PHV<q>	Set bypass voltage high loss point
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34	PGF<n>	Set bypass frequency high loss point

35	PF	Setting control parameter to default value
36	BATGN<nn>	Setting battery group number
37	HEH<nnn>	Set high efficiency mode voltage high loss point
38	HEL<nnn>	Set high efficiency mode voltage low loss point
39	PSK<n><m>	Set output socket release delay time in battery mode

一、 Rule

1. Computer and UPS respond both the "<cr>" as the end of a response.

2. UPS respond with “(“ start, and with one space separate the data.

3. In a UPS’s response, if there is no data, with “-” instead of data, and the length of the “-” as long as data.

4. In a UPS’s response, if some data length is less than the definition, type enough “#” before the data.

5. if UPS don’t accepts this command, responds (NAK<cr>

二、 Hardware Description

BAUD RATE.....: 2400 bps

DATA LENGTH.....: 8 bits

STOP BIT.....: 1 bit

PARITY.....: NONE

COMPUTER UPS

==========

RX (pin2) <----------> TX

TX (pin3) <----------> RX

GND (pin5) <----------> GND

(9 pins female D-type connector)

三、 Command

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

2 QMD<cr>: Model Inquiry

Computer: QMD<cr>

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

(a) UPS Model: TTTTTTTTTTTTTTT

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

(b) Output rated VA: 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: 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.

(g) Battery Piece Number: RR

R is an integer number ranging from 0 to 9.

(h) 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>

3 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
ECO mode	E
Converter mode	C
Shutdown mode	D

For example:

Computer: QMOD<cr>

UPS: (Y<cr>

means: the current UPS mode is bypass mode.

4 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

5 QGS<cr>: The general status parameters inquiry

Computer：QGS<cr>

UPS: (MMM.M HH.H LLL.L NN.N QQQ.Q DDD KKK.K VVV.V SSS.S XXX.X TTT.T b9b8b7b6b5b4b3b2b1b0<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	b9b8b7b6 b5b4b3b2 b1b0a0a1	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 a0: Bat test fail a1: Bat test OK

Example:

Computer: QGS<cr>

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

Means:

I/P voltage is 220.2V.

I/P frequency is 50.0Hz

O/P voltage is 220.0V

O/P frequency is 50.0Hz.

O/P current is 27.0A

O/P load 100%

Positive BUS voltage is 345.8V

Negative BUS voltage is 344.9V

P Battery voltage is 241.0V.

N Battery voltage is 241.5V.

Temperature is 45.0 degrees of centigrade.

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

6 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.

7 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.

8 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**
p	Enable/disable bypass audible warning
b	Enable/disable battery mode audible warning
r	Enable/disable auto-Restart.
o	Enable/disable bypass when UPS turn off.
a	Enable/disable audible alarm
s	Enable/disable battery deep discharge protect
v	Enable/disable converter mode
e	Enable/disable high efficiency mode
g	Enable/disable energy saving
h	Enable/disable short restart 3 times
c	Enable/disable code start
f	Enable/disable bypass forbiding
j	Enable/disable Output socket1 when the delay release time is over in battery mode .
l	Enable/disable Site fault detect
n	Enable/disable deep high efficiency mode
m	Set hot standby master/slave, PEM means master, PDM means slave
z	Enable/disable period self test

9 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 Type
a0	Battery disconnected

a1	
a2	Neutral and line wires oppositely connected
a3	
a4	
a5	Input frequency unstable in bypass
a6	Battery overcharged
a7	Low battery
a8	Overload
a9	
a10	EPO enabled
a11	
a12	Over temperature alarm
a13	Charger alarm
a14	
a15	
a16	
a17	
a18	
a19	
a20	
a21	
a22	
a23	
a24	
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a41	

a42	
a43	
a44	
a45	
a46	
a47	
a48	
a49	
a50	
a51	
a52	
a53	
a54	P1 cut off pre-alarm

10 QFS<cr>: Fault Status Inquiry

This command shows the information of the last UPS fault recorded on non-volatile memory.

If UPS never failed:

computer: QFS<cr>

UPS: (OK<cr> (no fault)

If there was 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 Type	Fault Code	Fault Name
Bus fault	0x01	Bus start fail
	0x02	Bus volt over
	0x03	Bus volt under
	0x04	Bus volt unbalance
	0x05	Bus short
Inverter fault	0x11	Inverter soft fail
	0x12	Inverter volt high
	0x13	Inverter volt low
	0x14	L1 inverter short
Electric link fault	0x27	Battery too high
	0x28	Battery too low
Others	0x41	Over temperature
	0x43	Overload fault

(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
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 □

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

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。

12 QID<cr>: The UPS ID inquiry

Computer：QID<cr>

UPS: (ABCDEEFFGXXXXX<cr>

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

Example:

Computer: QID<cr>

UPS: (83320903100001<cr>

13 QBV<cr>: The P battery information inquiry

Computer：QBV<cr>

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

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

14 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.

15 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。

16 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.

17 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.

18 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.

19 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

20 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

21 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.

22 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> 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)

23 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.

24 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 .

25 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

26 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.

27 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.

28 SKON<n> <cr>: Remote turn off UPS

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,

29 SKOFF<n> <cr>: Remote turn off UPS

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,

30 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
P	Enable/disable bypass audible warning
B	Enable/disable battery mode audible warning
R	Enable/disable auto-reboot.
O	Enable/disable bypass when UPS turn off.
A	Enable/disable audible alarm
S	Enable/disable battery deep discharge protect
V	Enable/disable converter mode
E	Enable/disable high efficiency mode
G	Enable/disable energy saving
H	Enable/disable short restart 3 times
C	Enable/disable code start
F	Enable/disable bypass forbidding
J	Enable/disable “Output socket1 when the delay release time is over in battery mode” .
L	Enable/disable Site fault detect
N	Enable/disable deep high efficiency mode
M	Set hot standby master/slave, PEM means master, PDM means slave
Z	Enable/disable period self test

31 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.

32 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

33 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

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

Computer: PGF<n><cr>

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

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

Computer: PGF54.6<cr>

UPS: (ACK<cr>

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

35 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
p	Enable/disable bypass audible warning
b	Enable/disable battery mode audible warning

r	Enable/disable auto-reboot.
o	Enable/disable bypass when UPS turn off.
a	Enable/disable audible alarm
s	Enable/disable battery deep discharge protect
v	Enable/disable converter mode
e	Enable/disable high efficiency mode
g	Enable/disable energy saving
h	Enable/disable short restart 3 times
c	Enable/disable code start
f	Enable/disable bypass forbiding
j	Enable/disable "Output socket1 when the delay release time is over in battery mode" .
l	Enable/disable Site fault detect
n	Enable/disable deep high efficiency mode
m	Set hot standby master/slave, PEM means master, PDM means slave
z	Enable/disable period self test

Notes: 1 is enable, 0 is disable.

36 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

37 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.

38 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.

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

Computer: PSF<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.