RS232 communication Protocol

Cabling:

COMPUTER DEVICE

==========

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

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

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

(9 pins female D-type connector)

Communication Description

BAUD RATE.....: 2400 bps

DATA LENGTH.....: 8 bits

STOP BIT.....: 1 bit

PARITY.....: NONE

1 Inquiry Command

1.1 QPI<cr>: Device Protocol ID Inquiry

Computer: QPI<cr>s

Device: (PI<NN><cr>

N is an integer number ranging from 0 to 9.

Function : To request the device Protocol ID.

Protocol ID distribution: please choose “00~14、99、80” for UPS products, and 15～24 for PV INVERTER products.

1.2 QID<cr>: The device ID inquiry

Computer：QID<cr>

Device: (ABCDEEFFGXXXXX<cr>

	Data	Description	Notes
a	(	Start byte	
b	A	Main Production type	
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	

1.3 QVFW<cr>: Main CPU Firmware version inquiry

Computer: QVFW<cr>

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

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

Example:

Computer: QVFW<cr>

Device: (VERFW:00123.01<cr>

00123: firmware series number；01：version。

1.4 QVFW2<cr> :Another CPU Firmware version inquiry

Computer: QVFW2<cr>

UPS: (VERFW2: <NNNNN.NN><cr>

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

1.5 QMD<cr>: Device Model Inquiry

Computer: QMD<cr>

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

(a) Device Model: TTTTTTTTTTTTTTT

This whole length is 15bits, if the model value less than 15 bits, please enter "#" before the device 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) Grid phase: P/P

P is an integer number of 1 or 3.

(e) Nominal device Voltage: MMM

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

(f) Nominal Grid 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>

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

1.6 QPIRI<cr>: Device Rating Information inquiry

Computer：QPIRI<cr>

Device: (BBB.B FF.F III.I EEE.E DDD.D AA.A GGG.G R MM T<cr>

	Date	Description	Notes
a	(	Start byte	
b	**BBB.B**	Grid rating voltage	B is an Integer ranging from 0 to 9. The units is V.
c	**FF.F**	Grid rating frequency	F is an Integer ranging from 0 to 9. The unit is HZ.
d	**III.I**	Grid rating current	I is an Integer ranging from 0 to 9. The unit is A.
e	**EEE.E**	AC output rating voltage	E is an Integer ranging from 0 to 9. The units is Hz.
f	**DDD.D**	AC output rating current	D is an Integer ranging from 0 to 9. The unit is A.
g	**AA.A**	Per MPPT rating current	A is an Integer ranging from 0 to 9. The units is A
h	**GGG.G**	Battery rating voltage	G is an Integer ranging from 0 to 9. The units is V.
i	**R**	MPPT track Number	R is an integer number ranging from 0 to 9
j	**MM**	Machine type	00: Grid tie; 01: Off Grid; 10: Hybrid.
k	**T**	Topology	0 transformerless 1 transformer

1.7 QPIGS<cr>: Device general status parameters inquiry

Computer：QPIGS<cr>

Device: (MMM.M CBBBBB HH.H CZZZ.Z LLL.L MMMMM NN.N QQQ.Q DDD KKK.K VVV.V SSS.S RRR.R XXX PPPPP EEEEE OOOOO UUU.U WWW.W YYY.Y TTT.T b7b6b5b4b3b2b1b0a0a1<cr>

	Data	Description	Notes
a	(	Start byte	
b	MMM.M	Grid voltage R	M is an Integer number 0 to 9. The units is V.
c	CBBBBB	Grid power R	B is an Integer ranging from 0 to 9. The units is W. C is an sign byte and an integer number of 1 or 0,0: positive ,1: negative
d	HH.H	Grid frequency	H is an Integer number 0 to 9. The units is Hz.
e	CZZZ.Z	Grid current R	Z is an Integer number 0 to 9. The units is A. C is an sign byte and an integer number of 1 or 0,0: positive ,1: negative
f	LLL.L	AC output voltage R	L is an Integer number 0 to 9. The units is V.
g	MMMMM	AC output power R	M is an Integer ranging from 0 to 9. The units is W.
h	NN.N	AC output frequency	N is an Integer number from 0 to 9. The units is Hz.
i	QQQ.Q	AC output current R	Q is an Integer number from 0 to 9. The units is A.
j	DDD	Output load percent	DEVICE: DDD is Maximum of W% or VA%. VA% is a percent of maximum VA. W% is a percent of maximum real power.
k	KKK.K	P BUS voltage	K is an Integer ranging from 0 to 9. The units is V.
l	VVV.V	S BUS voltage	V is an Integer ranging from 0 to 9. The units is V.
m	SSS.S	P battery voltage	S is an Integer ranging from 0 to 9. The units is V.
n	RRR.R	N battery voltage	S is an Integer ranging from 0 to 9. The units is V. (Used by other model)
o	XXX	Battery capacity	X is an Integer ranging from 0 to 9. The units is %.
q	PPPPP	PV Input power 1	P is an Integer ranging from 0 to 9. The units is W.
r	EEEEE	PV Input power 2	E is an Integer ranging from 0 to 9. The units is W.
s	OOOOO	PV Input power 3	O is an Integer ranging from 0 to 9. The units is W. (Used by other model)
t	UUU.U	PV Input voltage 1	U is an Integer ranging from 0 to 9. The units is V.
u	WWW.W	PV Input voltage 2	W is an Integer ranging from 0 to 9. The units is V. (Used by other model)
v	YYY.Y	PV Input voltage 3	Y is an Integer ranging from 0 to 9. The units is V.(Used by other model)
w	TTT.T	Max Temperature of the detecting pointers	T is an integer ranging from 0 to 9. The units is °C
x	b7b6b5b4b3b2b1b0a0a1	Device status	b7: reserve b6: reserve b5: reserve b4: reserve

			b3: Load status 0: Load off 1:Load on b2: Battery status b1: Battery status b2b1: 00: Do nothing 01: Charging 10: Discharging b0: Inv direction 0: DC-AC 1: AC-DC a0: Line direction a1: Line direction a0a1: 00 means unsteady 01 means Line input 10 means Line output

Example:

Computer: QPIGS<cr>

Device: (220.0 002200 50.0 010 220.0 005940 50.0 027.0 100 345.8 344.9 012.2 013.3082 004.2 00900 00940 00950 111.0 112.5 100.4 045.0 0100000000<cr>

Means:

Grid voltage L1 is 220.0V.

Grid power L1 is +02200W.

Grid frequency is 50.0Hz

Grid current L1 is 10A

AC output voltage L1 is 220.0V

AC output power L1 is +05940W

AC output frequency is 50.0Hz.

AC output current L1 is 27.0A

Output load 100%

P BUS voltage is 345.8V

S BUS voltage is 344.9V

P battery voltage value is 12.2V.

N battery voltage value is 13.3V.

Battery capacity is 82%.

Charging current is 24.2A

The PV 1 Input power is 900W.

The PV 2 Input power is 940W.

The PV 3 Input power is 950W.

The PV 1 Input voltage is 111.0V

The PV 2 Input voltage is 112.5V

The PV 3 Input voltage is 100.4V.

Temperature is 45.0 degrees of centigrade.

Device status is battery low.

1.8 QMOD<cr>: Device Mode inquiry

Computer: QMOD<cr>

Device: (M<cr>

MODE	CODE(M)	Notes
Power On Mode	P	Power on mode
Standby Mode	S	Standby mode
Bypass Mode	Y	Bypass mode
Line Mode	L	Line Mode
Battery Mode	B	Battery mode
Battery Test Mode	T	Battery test mode
Fault Mode	F	Fault mode
Shutdown Mode	D	Shutdown Mode
Grid mode	G	Grid mode
Charge mode	C	Charge mode

For example:

Computer: QMOD<cr>

DEVICE: (G<cr>

means: the current DEVICE mode is Grid mode.

1.9 QPIWS<cr>: Device Warning Status inquiry

Computer: QPIWS <cr>

Device: (a0a1…..a62a127<cr>

a0,…,a127 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**	Description
a0	PV fail	Default
a1	Auto adjust processing	CPU auto adjust its sensing on Grid, PV1, PV2 voltage.
a2	External flash fail	External flash fail
a3	PV loss	No input on PV and PV2
a4	PV low	The current PV voltage is too low can only start up the machine but cannot put on grid.

a5	Islanding detect	Has detect islanding
a6	Initial fail	Initialization failed in CPU
a7	Grid voltage high loss	The grid voltage has exceed the highest limit
a8	Grid voltage low loss	The grid voltage has exceed the lowest limit
a9	Grid frequency high loss	The grid frequency has exceed the highest limit
a10	Grid frequency low loss	The grid frequency has exceed the highest limit
a11	Feeding average voltage over	Average feeding voltage has exceed the upper limit
a12	get energy from the grid	Obtain energy from grid
a13	Grid fault	Emergent off grid
a14	Battery under	Battery voltage is too low
a15	Battery low	Battery voltage is too low
a16	Battery open	Do not found the battery
a17	Battery discharge low	Low voltage from over discharging
a18	Over load	Over load
A19	EPO active	EPO activate (Used by other model)
a20	PV1 loss	No input from PV1 (Used by other model)
a21	PV2 loss	No input from PV2 (Used by other model)
a22	Over temperature	Over temperature
A23	Ground loss	Ground loss
A24	Fan Lock	Problem found in Fan module

1.10 QFLAG<cr>: Device flag status inquiry

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

x	Control setting
a	Enable/disable silence buzzer or open buzzer
r	Enable/disable auto-Restart. (Used by other model)
b	Enable/disable battery mode audible warning
d	Enable/disable battery open status check (Used by other model)
l	Enable/disable Site fault detect (Used by other model)
m	Hot standby master/slave PEM means master, PDM means slave (Used by other model)
s	Enable/disable battery deep discharge protect (Used by other model)
t	Enable/disable battery low protect (if disable, the battery will discharge to 6V) (Used by other model)
c	Enable/disable code start (Used by other model)
f	Enable/disable bypass forbidding (Used by other model)
o	Enable/disable bypass when device turn off. (Used by other model)
p	Enable/disable buzzer audible in standby mode
h	Enable/disable short restart 3 times (Used by other model)
i	Enable/disable inverter short clear function (Used by other model)
w	Enable/disable inverter power on test by self (Used by other model)

Computer: QFLAG<cr>

Device: (ExxxDxxx<cr>(With undefined digits)

1.11 QT<cr>: **Time inquiry**

Computer: QT<cr>

Device**:**(YYYYMMDDHHMMSS<cr>

For example:

Computer: QT<cr>

DEVICE: (20100926111120<cr>

Means: The time is 2010/09/26,11:11:20.

	Data	Description	Notes
a	(	Start byte	
b	YYYYMMDD	Date	Y, M and D are an Integer number 0 to 9.
c	HHMMSS	Time	H, M and S are an Integer number 0 to 9.

1.12 QET<cr>: Inquiry total energy

Computer: QET<cr>

Device: (NNNNNNNN<cr>.

N is an Integer number 0 to 9. The unit is KWh.

For example:

Computer：QET<cr>

DEVICE: (03012300<cr>

Means: The total energy is: 3012300KWh

1.13 QEY<YYYYnnn><cr>: Inquiry total energy in the year

Computer: QEY<YYYYnnn><cr>

<YYYY> Y is an Integer number 0 to 9. nnn is the checksum for QEYYYYY and the decimal number towards lower 8 digits.

Device: (NNNNNNNN<cr>.

N is an Integer number 0 to 9. The unit is Wh.

For example:

Computer：QEY2011179<cr>

DEVICE: (03012300<cr>

Means: in 2010, the total energy is: 3012300Wh

1.14 QEM<YYYYMMnnn><cr>: Inquiry total energy in the month

Computer: QEM<YYYYMMnnn><cr>

<YYYYMM> Y is an Integer number 0 to 9, M is an Integer number 0 to 9. nnn is the checksum for QEMYYYYMM and the decimal number towards lower 8 digits.

Device: (NNNNNNN<cr>.

N is an Integer number 0 to 9. The unit is Wh.

For example:

Computer：Computer：QEM201107014<cr>

Device: (0312300<cr>

Means: in 2010/09, the total energy is: 312300Wh

1.15 QED<YYYYMMDDnnn><cr>: Inquiry total energy in the day

Computer: QED<YYYYMMDDnnn><cr>

<YYYYMMDD> Y is an Integer number 0 to 9, M is an Integer number 0 to 9, D is an Integer number 0 to 9. nnn is the checksum for QEDYYYYMMDD and the decimal number towards lower 8 digits.

Device: (NNNNNN<cr>.

N is an Integer number 0 to 9. The unit is Wh.

For example:

Computer：QED20110701102<cr>

Device: (030123<cr>

Means: in 2010/09/26, the total energy is: 30123Wh

1.16 QEH<YYYYMMDDHHnnn><cr>: Inquiry total energy in the hour

Computer: QEH<YYYYMMDDHHnnn><cr>

<YYYYMMDDHHnnn> Y is an Integer number 0 to 9, M is an Integer number 0 to 9,D is an Integer number 0 to 9,D is an Integer number 0 to 9,H is an Integer number 0 to 9. nnn is the checksum for QEHYYYYMMDDHH and the decimal number towards lower 8 digits.

Device: (NNNNN<cr>.

N is an Integer number 0 to 9. The unit is Wh.

For example:

Computer：QEH2011080902213<cr>

DEVICE: (05123<cr>

Means: at 19:00 2010/09/26, the total energy is: 5123Wh

1.17 QGOV<cr>: The grid output voltage range inquiry

Computer: QGOV <cr>
Device: (HHH.H LLL.L <cr>
Length: 12

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

1.18 QGOF<cr>: The grid output frequency range inquiry

Computer: QGOF <cr>
Device: (FF.F GG.G<cr>

	Data	Description	Notes
a	(	Start byte	
d	FF.F	The grid output freq high loss point	F is an Integer number 0 to 9. The unit is Hz.
c	GG.G	The grid output freq low loss point	G is an Integer number 0 to 9. The unit is Hz.

1.19 QOPMP<cr>: The current max output power inquiry

Computer: QOPMP<cr>
Device: (LLLLL<cr>

1.20 QMPPTV<cr>: The PV input voltage range inquiry for MPPT

Computer: QPVIPV<cr>
Device: (HHH LLL<cr>

	Data	Description	Notes
a	(	Start byte	
b	HHH	High voltage	H is an Integer number 0 to 9. The unit is V.
c	LLL	Low voltage	L is an Integer number 0 to 9. The unit is V.

1.21 QPVIPV<cr>: The PV input voltage range inquiry

Computer: QPVIPV<cr>
Device: (HHH LLL<cr>

	Data	Description	Notes
a	(	Start byte	
b	HHH	The upper limit of input voltage	H is an Integer number 0 to 9. The unit is V.
c	LLL	The lowest limit of input voltage	L is an Integer number 0 to 9. The unit is V.

1.22 QLST<cr>: The LCD sleep time inquiry

Computer: QLST<cr>
Device: (LL<cr>
LL is a number to 00、01、02、10、20, default 02, 00 means always light, the unit is 30s.

1.23 QTPR<cr>: The temperature inquiry

Computer: QTPR<cr>
Device: (LLL.L SSS.S TTT.T ---.-<cr>

	Data	Description	Notes
a	(	Start byte	
b	LLL.L	Boost temperature	L is an Integer ranging from 0 to 9. The units is °C
c	SSS.S	Inverter temperature	S is an Integer ranging from 0 to 9. The units is °C
d	TTT.T	Inner temperature	T is an Integer ranging from 0 to 9. The units is °C
e	---.-	Reservation	---.-: Reservation

1.24 QDI2<cr>: The default setting value information

Computer: QDI2<cr>

Device: (HH.H LL.L NNN ----------<cr>

	Data	Description	Notes
A0	(	Start byte	
A1~A4	HH.H	The max charging current	H is an Integer number 0 to 9. The unit is V.
A6~A9	LL.L	The max charging volt	L is an Integer number 0 to 9. The unit is V.
A11~A13	NNN	The waiting time for feeding	N is an Integer number 0 to 9. The unit is S. (Used by other model)
A14~A62		Reserved	

1.25 QDI<cr>: The default setting value information

Computer: QDI<cr>

Device: (BBB.B CCC.C DD.D EE.E FFF.F GGG.G HH.H II.I JJJ KKK LLL MMM NNNNN OOO PP QQ RRR SS<cr>

	Data	Description	Notes
a	(	Start byte	
b	BBB.B	Grid output voltage high loss point	B is an Integer ranging from 0 to 9. The unit is V.
c	CCC.C	Grid output voltage low loss point	C is an Integer ranging from 0 to 9. The units is V.
d	DD.D	Grid output frequency high loss point	D is an Integer ranging from 0 to 9. The unit is Hz.
e	EE.E	Grid output frequency low loss point	E is an Integer ranging from 0 to 9. The unit is Hz.
f	FFF.F	Grid input voltage high loss point	F is an Integer ranging from 0 to 9. The unit is V.
g	GGG.G	Grid input voltage low loss point	G is an Integer ranging from 0 to 9. The unit is V.
h	HH.H	Grid input frequency high loss point	H is an Integer ranging from 0 to 9. The unit is Hz.
i	II.I	Grid input frequency low loss point	I is an Integer ranging from 0 to 9. The unit is Hz.
j	JJJ	The upper limit of PV input voltage	J is an Integer ranging from 0 to 9. The unit is V.

k	KKK	The lowest limit of PV input voltage	K is an Integer ranging from 0 to 9. The unit is V.
l	LLL	The PV input high voltage for MPPT	L is an Integer ranging from 0 to 9. The unit is V.
m	MMM	The PV input low voltage for MPPT	Mis an Integer ranging from 0 to 9. The unit is V.
n	NNNNN	Max output power	N is an Integer ranging from 0 to 9. The unit is W.
o	OOO	Long time grid average voltage high loss point	O is an Integer ranging from 0 to 9. The unit is V.
p	PP	LCD sleep time	P is an Integer ranging from 0 to 9. The unit is 30s.
q	QQ	Battery piece number	Q is an Integer ranging from 0 to 9.
r	RRR	Battery total capacity	R is an Integer ranging from 0 to 9. The unit is Ah. (Used by other model)
s	SS	Charger current	S is an Integer ranging from 0 to 9. The unit is A. (Used by other model)

========Device inner command=========

1.26 QGLTV<cr>: The grid long time average voltage range inquiry

Computer: QGLTV<cr>

Device: (HHH LLL <cr>

	Data	Description	Notes
a	(	Start byte	
b	HHH	The grid input long time average voltage high loss point	H is an Integer number 0 to 9. The unit is V.
c	LLL	The grid input long time average voltage low loss point	L is an Integer number 0 to 9. The unit is V. (Used by other model)

The grid input long time average voltage rang from 253 to 264V, default 253V, the precision is 1 volt.

1.27 QCHGS<cr>: Charger status inquiry

Computer: QCHGS<cr>

Device: (AA.A BB.B CC.C DD.D<cr>

	Data	Description	Notes
a	(	Start byte	
b	AA.A	Charging current	A is an Integer number 0 to 9. The unit is A.
c	BB.B	Max charging voltage	B is an Integer number 0 to 9. The unit is V.

d	CC.C	Max charging current	C is an Integer number 0 to 9. The unit is A.
e	DD.D	Bulk charging voltage	D is an Integer number 0 to 9. The unit is V.

1.28 QVFTR<cr>: The grid information range can be set inquiry

Computer: QVFTR <cr>
Device: (HHH.H MMM.M LLL .L NNN.N ZZ.Z XX.X WW.W YY.Y AAA BBB ---- ----
Length: 129

	Data	Description	Notes
A0	(	Start byte	
A1-A5	HHH.H	The max grid output voltage high loss point	H is an Integer number 0 to 9. The unit is V.
A7-A11	MMM.M	The min grid output voltage high loss point	M is an Integer number 0 to 9. The unit is V.
A13-A17	LLL.L	The max grid output voltage low loss point	L is an Integer number 0 to 9. The unit is V.
A19-A23	NNN.N	The min grid output voltage low loss point	N is an Integer number 0 to 9. The unit is V.
A25-A28	ZZ.Z	The max grid output frequency high loss point	Z is an Integer number 0 to 9. The unit is Hz.
A30-A33	XX.X	The min grid output frequency high loss point	X is an Integer number 0 to 9. The unit is Hz.
A35-A38	WW.W	The max grid output frequency low loss point	W is an Integer number 0 to 9. The unit is Hz.
A40-A43	YY.Y	The min grid output frequency low loss point	Y is an Integer number 0 to 9. The unit is Hz.
A45-A47	AAA	The max waiting time for feeding	A is an Integer number 0 to 9. The unit is S. (Used by other model)
A49-A51	BBB	The min waiting time for feeding	B is an Integer number 0 to 9. The unit is S. (Used by other model)
A53-A56	CC.C	The max voltage for max charging voltage	C is an Integer number 0 to 9. The unit is V.
A58-A61	DD.D	The min voltage for max charging voltage	D is an Integer number 0 to 9. The unit is V.
……		Reserved	
A128		Reserved	

1.29 QPIHF<NN><cr>: The historical fault inquiry

<NN> NN is 2 Integer number 0 to 9.Means fault ID.

If there are device fail occur:

Computer: QPIHF<03><cr>

Inverter fault		
Bus over voltage	01	BUS has exceed the highest limit
Bus under voltage	02	BUS has exceed the lowest limit
Bus soft start time out	03	BUS soft star runs out of time
Inverter soft start time out	04	Inverter soft star runs out of time
Inverter short	05	Inverter over current
Over temperature	06	Over temperature
Relay fault	07	Relay problem
DC current sensor fail	08	Inductor current CT problem
PV high voltage	09	The voltage for PV is too high
Power down	10	Auxiliary power problem
PV input short	11	Over current at PV input

GFCI over	12	Leakage current exceed the permit range
PV isolation low	13	PV insulation value is too low
Inverter DC current over	14	Inverter DC component has exceeds the permitted limit
Line value consistent fail between MCU & DSP	15	The sensing grid voltage and frequency by MCU 与 DSP has exceeded the permitted limit
GFCI sensor fail	16	GFCI sensor (CT) fail
Connect fail between MCU & DSP	17	Connect fail between MCU & DSP
Communication fail between MCU & DSP	18	Communication fail between MCU & DSP
Ground loss	19	It can not found grounding
Discharge fail	20	Discharge circuit problem
Discharge Soft Time Out	21	Discharge Soft Time Out
Battery over charge	22	Battery over charge
Over load	23	Over load
Battery open	24	Battery open（for off grid type）
Inverter over current for long time	25	Inverter over current for long time

Inverter short	26	IT found Inverter has short

Device: (KK YYYYMMDDHHMMSS AAA.A BBB.B CCC.C DDD.D EEE.E FFF.F GGG.G HHH.H III.I JJ.J CKKK.K LLL MMM.M NNN.N OO.O PPP.P QQQ.Q <b15b14b13b12b11b10b9b8b7b6b5b4b3b2b1b0><cr>

(a) Start byte: (

(b) Fault kind: KK ; KK is 2 bytes of ASCII code

(c) Fault time: YYYYMMDDHHMMSS (Such as, 20110128092050 means 2011/01/28, 09: 20: 50)

(d) PV1 input voltage before fault: AAA.A

(e) PV1 current before fault: BBB.B

(f) PV2 input voltage before fault: CCC.C

(g) PV2 current before fault: DDD.D

(h) PV3 input voltage before fault: EEE.E

(i) PV3 current before fault: FFF.F

(j) Inverter R voltage before fault: GGG.G

(k) Inverter R current before fault: HHH.H

(l)Grid R voltage before fault: III.I

(m)Grid Frequency before fault: JJ.J

(n)Grid R current before fault: CKKK.K (C Sign bit，0: grid output , 1:grid input)

(o)Output load percentage before fault: LLL

(p)AC output R current before fault: MMM.M

(q)AC output R voltage before fault: NNN.N

(r) AC output frequency before fault: OO.O

(s)Battery voltage before fault: PPP.P

(t)Max temperature before fault: QQQ.Q

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

b15 : PV1 boost on

b14 : PV2 boost on

b13 : PV3 boost on

b12 : Inverter on

b11 : 1: PV1 MPPT by boost; 0: PV1 MPPT by inverter

b10 : 1: PV2 MPPT by boost; 0: PV2 MPPT by inverter

b9 : 1: PV3 MPPT by boost; 0: PV3 MPPT by inverter

b8 : O/P relay on

b7 : Inverter relay on

b6 : Safe relay on

b5 : Main relay on

b4 : AC relay on

b3 : Reserved

b2 : Reserved

b1 : Reserved

b0 : DC TO DC on

1.30 QPICF<cr>: The current fault inquiry

Computer: QPICF<cr>

Device: (KK NN

Start byte: (

Fault kind: KK ; KK is 2 bytes of ASCII code

NN is 2 Integer number 0 to 8,means the latest fault ID。

2 Setting parameters Command

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

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

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

PExxxPDxxx set flag status. PE means enable, PD means disable

x	Control setting
A	Enable/disable silence buzzer or open buzzer
R	Enable/disable auto-Restart. (Used by other model)
B	Enable/disable battery mode audible warning Buzz
D	Enable/disable battery open status check (Used by other model)
L	Enable/disable Site fault detect (Used by other model)
M	Hot standby master/slave PEM means master, PDM means slave (Used by other model)
S	Enable/disable battery deep discharge protect (Used by other model)
T	Enable/disable battery low protect (if disable, the battery will discharge to 6V) (Used by other model)
C	Enable/disable code start (Used by other model)
F	Enable/disable bypass forbidding (Used by other model)
O	Enable/disable bypass when device turn off. (Used by other model)
P	Enable/disable buzzer audible in standby mode
H	Enable/disable short restart 3 times (Used by other model)
I	Enable/disable inverter short clear function (Used by other model)
W	Enable/disable inverter power on test by self (Used by other model)

2.2 DAT<YYMMDDHHMMSS><cr>: Date and time

Computer: DAT<YYMMDDHHMMSS><cr>

<Y, M, D, H, S> is an integer number 0 to 9.

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

2.3 GOLF<MM.M><cr>: Set grid output frequency low loss point

Computer: GOLF<MM.M><cr>

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

In 50Hz system, <MM.M> is a number ranging from 45.0to 49.8, default 47.5Hz; in 60Hz system, <MM.M> is a number ranging from 55.0 to 59.8, default 47.5Hz; the precision is 0.1Hz;

Computer: GOLF42.1<cr>

Device: (ACK<cr>

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

2.4 GOHF<NN.N><cr>: Set grid output frequency high loss point

Computer: GOHF<NN.N><cr>

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

In 50Hz system, <NN.N> is a number ranging from 50.1 to 54.8, default 50.2Hz; in 60Hz system, <NN.N> is a number ranging from 60.2 to 64.8, default 60.5Hz; the precision is 0.1Hz.

Computer: GOHF54.6<cr>

Device: (ACK<cr>

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

2.5 GOLV<VVV.V><cr>: Set grid output voltage low loss point

Computer: GOLV<VVV.V><cr>

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

<VVV.V> is a number ranging from 176 to 220, default 184V. The precision is 1 volt.

For example:

Computer: GOLV185.0<cr>

Device: (ACK<cr>

Means: Set the grid output voltage low loss point to 185.0V.

2.6 GOHV<VVV.V><cr>: Set grid output voltage high loss point

Computer: GOHV<VVV.V><cr>

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

<VVV.V> is a number ranging from 240to 276, default 264V. The precision is 1 volt.

For example:

Computer: GOHV260.5<cr>

Device: (ACK<cr>
Means: Set the grid output voltage high loss point to 260.5V

2.7 OPMP<nnnnn><cr>: Set the max output power

Computer: OPMP<nnnnn><cr>
Device: (ACK<cr> if device accepts this command, otherwise, responds (NAK<cr>
<nnnnn> is a number ranging from 0 to 3000W, default 3000W. The precision is 1 W.
For example:
Computer: OPMP <03000><cr>
Device: (ACK<cr>
Means: Set the max output power to 3000W.

2.8 MPPTHV<nnn><cr>: Set the PV input high voltage for MPPT

Computer: MPPTHV<nnn><cr>
Device: (ACK<cr> if device accepts this command, otherwise, responds (NAK<cr>
<nnn> is a number ranging from 400 to 450V, default 450V. The precision is 1 V.
For example:
Computer: MPPTHV<400><cr>
Device: (ACK<cr>
Means: Set the PV input high voltage to 400V for MPPT.

2.9 MPPTLV<nnn><cr>: Set the PV input low voltage for MPPT

Computer: MPPTLV<nnn><cr>
Device: (ACK<cr> if device accepts this command, otherwise, responds (NAK<cr>
<nnn> is a number ranging from 110 to 200V, default 110V. The precision is 1 V.
For example:
Computer: MPPTHV<150><cr>
Device: (ACK<cr>
Means: Set the PV input low voltage to 150V for MPPT.

2.10 PVIPHV<nnn><cr>: Set the upper limit of PV input voltage

Computer: IPHV<nnn><cr>
Device: (ACK<cr> if device accepts this command, otherwise, responds (NAK<cr>
<nnn> is a number ranging from 450 to 510V, default 500V. The precision is 1 V.
For example:
Computer: IPHV<230><cr>

Device: (ACK<cr>
Means: Set the upper limit of input voltage to 230V.

2.11 PVIPLV<nnn><cr>: Set the lowest limit of PV input voltage

Computer: IPLV<nnn><cr>
Device: (ACK<cr> if device accepts this command, otherwise, responds (NAK<cr>
<nnn> is a number ranging from 90 to 200V, default 150V. The precision is 1 V.
For example:
Computer: IPLV<230><cr>
Device: (ACK<cr>
Means: Set the upper limit of input voltage to 230V.

2.12 LST<nn><cr>: Set LCD sleep time

Computer: LST<nn><cr>
Device: (ACK<cr> if device accepts this command, otherwise, responds (NAK<cr>
<nn> is a number to 00、01、02、10、20, default 02, 00 means always light, the unit is 30s.
For example:
Computer: LST <01><cr>
Device: (ACK<cr>
Means: Set LCD sleep time to 30s.

2.13 PF<cr>: Setting control parameter to default value

Computer: PF<cr>
Device: (ACK<cr> if device accepts this command, otherwise, responds (NAK<cr>
All Device parameters set to default value.

x	Parameter setting	
	Parameter	Default value
1	Grid output voltage high loss point	264V
2	Grid output voltage low loss point	184V
3	Grid output frequency high loss point	50.2Hz
4	Grid output frequency low loss point	47.5Hz
5	Grid input voltage high loss point	264V
6	Grid input voltage low loss point	184V
7	Grid input frequency high loss point	50.2Hz
8	Grid input frequency low loss point	47.5Hz
9	The upper limit of PV input voltage	450V
10	The lowest limit of PV input voltage	150V
11	The PV input high voltage for MPPT	450V

12	The PV input low voltage for MPPT	110V
13	Max output power	3000W
14	Long time grid average voltage high loss point	253V
15	LCD sleep time	60s
16	Battery piece number	20
17	Battery total capacity	999Ah
18	Charger current	10A

The correct default value can be gain by QDI command.

x	Control setting
a	**Enable**/disable silence buzzer or open buzzer
r	**Enable**/disable auto-Restart.
b	Enable/disable battery mode audible warning
d	Enable/disable battery open status check
l	**Enable**/disable Site fault detect
m	Hot standby **master**/slave PEM means master, PDM means slave
s	Enable/disable battery deep discharge protect
t	Enable/disable battery low protect (if disable, the battery will discharge to 6V)
c	Enable/disable code start
f	Enable/disable bypass forbidding
o	Enable/disable bypass when device turn off.
p	**Enable**/disable buzzer audible in standby mode
h	Enable/disable short restart 3 times
i	Enable/disable inverter short clear function

======Device Inner Command====

2.14 MCHGC<nn.n><cr>: Setting max charging current

Computer: MCHGC<nn.n><cr>

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

nnn is from 005 to 250 Ah.

2.15 MCHGV<nn.n><cr>: Setting max charging voltage

Computer: MCHGV <nn.n><cr>

Device: (ACK<cr> if device accepts this command, otherwise, responds (NAK<cr>
nnn is from 480 to bulk charging voltage .

2.16 GLTHV<nnn><cr>: Set the grid long time average voltage high loss point

Computer: GLTHV<nnn><cr>
Device: (ACK<cr> if device accepts this command, otherwise, responds (NAK<cr>
nnn is form 253 to 264.