Voltronic Power

InfiniSolar RS232 communication Protocol

InfiniSolar RS232 communication Protocol 1

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Hardware Description

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

Cabling:

COMPUTER DEVICE
==========
RX (pin2) <----------> TX

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

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

(9 pins female D-type connector)

Note:

All commands return values have a CRC check before '0x0d', in addition to 'QPI',but the command coming from PC without CRC.

for example:

Computer: Computer: QMOD<cr>

Device: (S<CRC><cr>

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. 11.Home solar
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~~(Reserved)	~~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 2: Do nothing 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	Reserved	Reserved
a1	Reserved	Reserved
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	Reserved	Reserved
a13	Reserved	Reserved
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	Reserved	Reserved
a20	Reserved	Reserved
a21	Reserved	Reserved
a22	Over temperature	Over temperature
A23	Ground loss	Ground loss
A24	Fan Lock	Problem found in Fan module
A25	Grid input voltage loss	The grid voltage out of range
A26	Grid input frequencyloss	The grid frequencyout of range

A27	Battery Weak	Battery weak(for Starting the generator)

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
p	Enable/disable buzzer audible in standby mode
c	Enable/disable wide AC input

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 2011, 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 2011/07, 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 2011/07/01, 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 2011/08/09, 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)

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	Floating 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 QDM<cr>: The model of device inquiry

Computer:QDM<cr>

Device: (VVV<cr>

VVV is an integer number 000 to 999.

The meaning of the value is shown as following.

Value	Model
000	VDE Type(Used by other model)
001	AS4777 Type(Used by other model)
002	DK Type(Used by other model)

003	RD1663 Type(Used by other model)
004	G83 Type(Used by other model)
005	TaiwanType (Used by other model)
006	USHType (Used by other model)
007	USLType(Used by other model)
008	VDE4105Type(Used by other model)
009	KoreaType(Used by other model)
010	HongSunType(Used by other model)
011	SwedenType(Used by other model)
012	1MPPTType(Used by other model)
013~049	reserve
050	Infini-Solar 3KW hybrid type VDE Type
051	Infini-Solar 3KW hybrid type AS4777 Type
052	Infini-Solar 3KW hybrid type DK Type
053	Infini-Solar 3KW hybrid type RD1663 Type
054	Infini-Solar 3KW hybrid type G83 Type
055	Infini-Solar 3KW hybrid type TaiwanType
056	Infini-Solar 3KW hybrid type USHType
057	Infini-Solar 3KW hybrid type USLType
058	Infini-Solar 3KW hybrid type VDE4105Type
059	Infini-Solar 3KW hybrid type KoreaType
060	Infini-Solar 3KW hybrid type HongSunType
061	Infini-Solar 3KW hybrid type SwedenType
068	Infini-Solar 3KW hybrid type NRS097
069	Infini-Solar 3KW hybrid type IndianType
062~099	reserve
100	Infini-Solar 3KW Grid type VDE Type
101	Infini-Solar 3KW Grid type AS4777 Type
102	Infini-Solar 3KW Grid type DK Type
103	Infini-Solar 3KW Grid type RD1663 Type
104	Infini-Solar 3KW Grid type G83 Type
105	Infini-Solar 3KW Grid type TaiwanType
106	Infini-Solar 3KW Grid type USHType
107	Infini-Solar 3KW Grid type USLType
108	Infini-Solar 3KW Grid type VDE4105Type(
109	Infini-Solar 3KW Grid type KoreaType
110	Infini-Solar 3KW Grid type HongSunType
111	Infini-Solar 3KW Grid type SwedenType
118	Infini-Solar 3KW Grid type NRS097
119	Infini-Solar 3KW Grid type IndianType
112~149	reserve
150	Infini-Solar 3KW off Grid type

1.29 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
a	(	Start byte	
b	HHH	The max grid output voltage high loss point	H is an Integer number 0 to 9. The unit is V.
c	MMM	The min grid output voltage high loss point	M is an Integer number 0 to 9. The unit is V.
d	LLL	The max grid output voltage low loss point	L is an Integer number 0 to 9. The unit is V.
e	NNN	The min grid output voltage low loss point	N is an Integer number 0 to 9. The unit is V.
f	ZZ.Z	The max grid output frequency high loss point	N is an Integer number 0 to 9. The unit is Hz.
g	XX.X	The min grid output frequency high loss point	X is an Integer number 0 to 9. The unit is Hz.
h	WW.W	The max grid output frequency low loss point	W is an Integer number 0 to 9. The unit is Hz.
i	YY.Y	The min grid output frequency low loss point	Y is an Integer number 0 to 9. The unit is Hz.
j	AAA	The max waiting time for feeding	A is an Integer number 0 to 9. The unit is S. (Used by other model)
k	BBB	The min waiting time for feeding	A is an Integer number 0 to 9. The unit is S. (Used by other model)
l	NN.N	The max floating charging voltage	N is an Integer number 0 to 9. The unit is V.
m	NN.N	The min floating charging voltage	N is an Integer number 0 to 9. The unit is V.
n	NN.N	The max charging current	N is an Integer number 0 to 9. The unit is V.
o	NN.N	The min charging current	N is an Integer number 0 to 9. The unit is V.
p	NNN	The max PV upper limit of input voltage	N is an Integer number 0 to 9. The unit is V.
q	NNN	The min PV upper limit of input voltage	N is an Integer number 0 to 9. The unit is V.

r	NNN	The max PV lowest limit of input voltage	N is an Integer number 0 to 9. The unit is V.
s	NNN	The min PV lowest limit of input voltage	N is an Integer number 0 to 9. The unit is V.
t	NNN	The max MPPT high voltage	N is an Integer number 0 to 9. The unit is V.
u	NNN	The min MPPT high voltage	N is an Integer number 0 to 9. The unit is V.
v	NNN	The max MPPT low voltage	N is an Integer number 0 to 9. The unit is V.
w	NNN	The min MPPT low voltage	N is an Integer number 0 to 9. The unit is V.
x	XXXXX	The max output power	X is an Integer number 0 to 9. The unit is V.
y	XXXXX	The min output power	X is an Integer number 0 to 9. The unit is V.
z	NN.N	The max charging voltage	N is an Integer number 0 to 9. The unit is V.
A	NN.N	The min charging voltage	N is an Integer number 0 to 9. The unit is V.

1.30 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
Fan Stop	27	Fan Stop

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

1.31 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。

1.32 QBSDV <cr>:The discharge cut-off voltage inquiry

Computer: QBSDV<cr>

Device: (aa.a bb.b cc.c dd.d

aa.a is battery cut-off discharging voltage when Grid is unavailable.

bb.b is battery cut-off discharging voltage when Grid is available.

cc.c is battery re-discharging voltage when Grid is available.

dd.d is battery re-discharging voltage when Grid is unavailable:

1.33 QPRIO<cr>:The PV energy supply priority

Computer: QPRIO<cr>

Device: (XX<CRC><cr>

XX is an integer number 01 to 03.

For example:

Computer: QPRIO<cr>

DEVICE: (02<CRC><cr>

Means: The current PV energy supply priority is 2.

code	PV energy supply priority
01	Bat – Load –Grid
02	Load – Bat – Grid
03	Load – Grid – Bat

1.34 QENF<cr>:Function enable/disable status inquiry

Computer:QFCF<cr>

Device:(AxBxCxDxExFxGxHxI-J-<CRC><cr>

x is “0” or “1”,”0” means disable,”1”enable.

code	description
A	PV charger
B	AC charger
C	Feed in grid
D	Battery discharge load if PV is available
E	Battery discharge load if PV is unavailable
F	Battery discharge to feed grid if PV is available
G	Battery discharge to feed grid if PV is unavailable
H	Reserved
I	Reserved
J	Reserved

1.35 QEBGP<cr>: Feeding power adjust and battery type inquiry

Computer:QEBGP<cr>

Device:(±aaa b<CRC><cr>

aaa：Feeding power adjust

b: battery type

0: lead acid battery

1: lithium battery

1.36 QOPF<cr>: Feed-in power factor inquiry

Computer: QOPF<cr>

Device:(nnn<CRC><cr>

nnn：090~100 means +0.90~1.00， 190~199 means -0.90~0.99.

1.37 QMDCC<cr>: Inquire battery Max. discharged current in hybrid mode

Computer: QMDCC<cr>

Device:(nnn<CRC><cr>

nnn：010~150, the unit is A.

1.38 QPKT<cr>: AC charging time inquiry

Computer: QPKT<cr>

Device:(aabb ccdd<CRC><cr>

aabb: the starting time of AC charge, aa is hour, bb is minute

ccdd: the ending time of AC charge, cc is hour, dd is minute

1.39 QLDT<cr>: AC output ON/OFF time inquiry

Computer: QLDT<cr>

Device:(aabb ccdd<CRC><cr>

aabb: the time of AC output ON, aa is hour, bb is minute

ccdd: the time of AC output OFF, cc is hour, dd is minute

1.40 QBSDP<cr>: Battery stop discharge percentage inquiry

Computer: QBSDP<cr>

Device: (aaa bbb ccc ddd<CRC><cr>

aaa: Battery stop discharge percentage when grid is unavailable;

bbb: Battery stop discharge percentage when grid is available;

ccc: Battery re-discharge percentage when grid is unavailable;

ddd: Battery re-discharge percentage when grid is available;

2 Control Command

2.1 SON<cr>: Remote turn on Device

Computer: SON<cr>

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

Means: Remote turn on Device.

2.2 SOFF<cr>: Remote turn off Device

Computer: SOFF<cr>

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

Means: Remote turn off Device.

3 Setting parameters Command

3.1 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
P	Enable/disable buzzer audible in standby mode
C	Enable/disable wide AC input

3.2 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>

3.3 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 45.0 to 49.9; in 60Hz system, <MM.M> is a number ranging from 55.0 to 59.9; 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

3.4 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 55.0; in 60Hz system, <NN.N> is

a number ranging from 60.1 to 65.0; 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.

3.5 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 180 to 225. 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.

3.6 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 235 to 276. 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

3.7 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.

3.8 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.

3.9 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.

3.10 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.

3.11 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.

3.12 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.

3.13 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	264.5V
2	Grid output voltage low loss point	184V
3	Grid output frequency high loss point	51.5Hz
4	Grid output frequency low loss point	47.5Hz
5	Grid input voltage high loss point	264.5V
6	Grid input voltage low loss point	184V
7	Grid input frequency high loss point	51.5Hz
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

3.14 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.

3.15 MCHGV<nn.n><cr>: Setting floating 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 .

3.16 BCHGV<nn.n><cr>: Setting bulk charging voltage

Computer: BCHGV <nn.n><cr>

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

nnn is from 50.0 to 58.0v .

3.17 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.

3.18 BSDV<aa.a bb.b><cr>:Setting discharge cut-off voltage

Computer: BSDV <nn.n><cr>

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

aa.a is battery cut-off discharging voltage when Grid is unavailable. The number ranging is from 40.0 to 48.0, default 42.0V

bb.b is battery cut-off discharging voltage when Grid is available. The number ranging is from 40.0 to 48.0, default 48.0v

3.19 DSUBV<aa.a bb.b><cr>:Setting re-discharge voltage

Computer: DSUBV <aa.a bb.b><cr>

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

aa.a is battery re-discharging voltage when Grid is unavailable. The number ranging is from battery cut-off discharging voltage when Grid is unavailable. to max charging voltage, default 48.0V

bb.b is battery re-discharging voltage when Grid is available. The number ranging is from battery cut-off discharging voltage when Grid is available. to max charging voltage, default 54.0V

3.20 PRIO <XX><cr>：Set the PV energy supply priority

Computer:PRIO <XX><cr>

XX is an integer number 01 to 03.

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

For example:

Computer: PRIO 03<cr>

DEVICE: (ACK<CRC><cr>

code	PV energy supply priority

01	Bat – Load –Grid
02	Load – Bat – Grid
03	Load – Grid – Bat

3.21 ENF<X0or1><cr>: Setting function enable/disenable

X means function code

Computer:ENFA1<cr>

A is PV charging enabled

A1 PV mains charging enabled

A0 PV mains charging disenabled

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

Code	Description
A	Enable/disable PV charger
B	Enable/disable AC charger
C	Enable/disable feed in grid
D	Enable/disable battery discharge load when PV is available
E	Enable/disable battery discharge load when PV is unavailable
F	Enable/disable battery discharge grid when PV is available
G	Enable/disable battery discharge grid when PV is unavailable
H	Reserved
I	Reserved
J	Reserved

3.22 LBF<X ><cr>: Setting Battery type

X is 0or1

0: lead acid battery

1: lithium battery

For example:

Computer:LBF1<cr>

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

3.23 SOPF<±nnn ><cr>: Setting feed-in power factor

nnn: 090~100

For example:

Computer: SOPF+090<cr>

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

3.24 SMDCCnnn<cr>: Setting battery Max. discharged current in hybrid mode

nnn: 010~150, the unit is A.

For example:

Computer: SMDCC150<cr>

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

3.25 ABGP±nnn<cr>: Setting grid power adjustment

nnn: 000~100, the unit is W.

For example:

Computer: ABGP+100<cr>

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

3.26 PKT<aabb ccdd ><cr>: Setting AC charge time

aabb: the starting time of AC charge, aa is hour, bb is minute

ccdd: the ending time of AC charge, cc is hour, dd is minute

For example:

Computer: PKT0400 0900<cr>

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

Means: Set the AC charging duration 04:00~09:00. 00:00~00:00 means AC charger operates all-time.

3.27 LDT<aabb ccdd ><cr>: Setting AC output ON/OFF time

aabb: the time of AC output ON, aa is hour, bb is minute

ccdd: the time of AC output OFF, cc is hour, dd is minute

For example:

Computer: LDT0400 0900<cr>

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

Means: The device auto start at 04:00,and it auto shutdown at 09:00.

3.28 BSDP<aaa bbb>: Setting battery stop discharge percentage

aaa: the percentage of battery stop discharge when grid is unavailable.

bbb: the percentage of battery stop discharge when grid is available.

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

3.29 DMODEL<nnn>: Setting model of device

nnn: As per QDM list

Before send this command, please send OEEPB first.