Voltronic Power

Axpert Remote Panel Communication Protocol

(for MKS II& MKSIII)

Axpert Remote Panel Communication Protocol
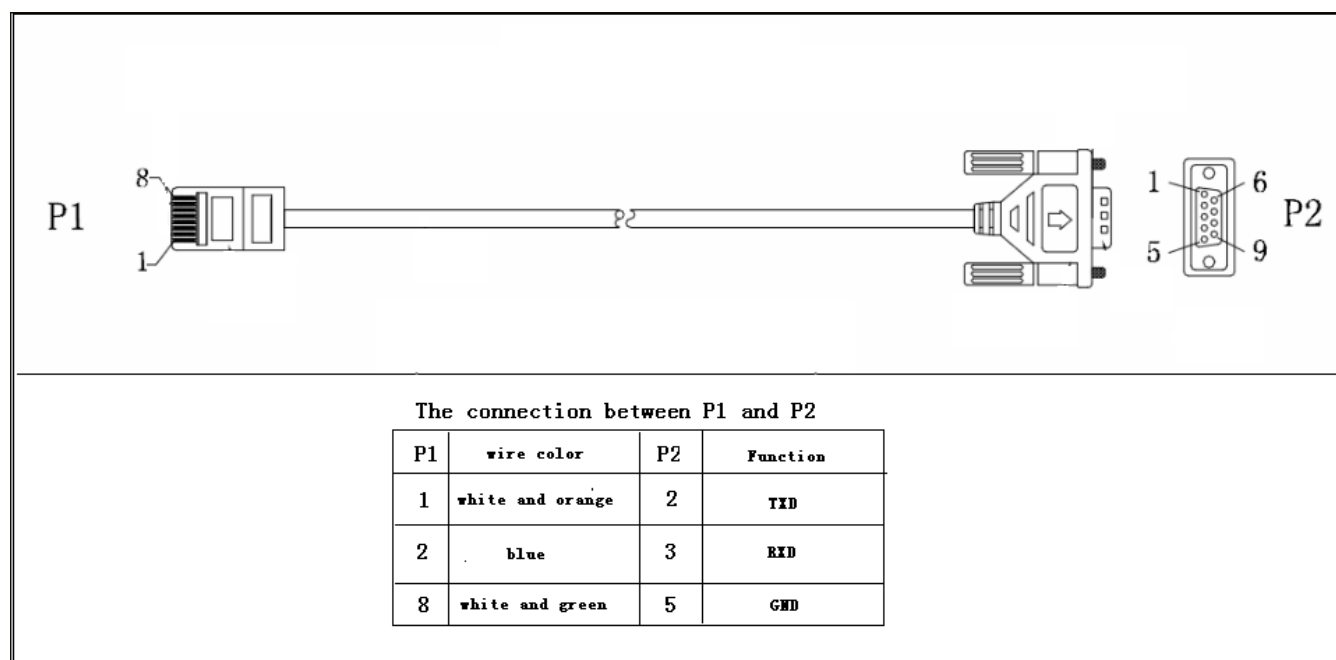
Version	Modification	Author	Date
1.00	1. Initial version, based on the Voltronic Power Axpert Remote Panel Communication Protocol (for VMIII & KING & MKSII) 修改记录.txt	Zmj	2020-10-23

RJ45 to RS232 cable between computer and device

The connection between P1 and P2

P1	wire color	P2	Function
1	white and orange	2	TXD
2	blue	3	RXD
8	white and green	5	GND

1 Communication format

Baud rate	Start bit	Data bit	Parity bit	Stop bit
2400	1	8	N	1

2 Inquiry Command

2.1 QPI<cr>: Device Protocol ID Inquiry

Computer: QPI<CRC><cr>

Device: (PI<NN><CRC><cr>

N is an integer number ranging from 0 to 9.

Function: To request the device Protocol ID.

Protocol ID distribution: 30 for Axpert series

2.2 QID<cr>: The device serial number inquiry

Computer: QID<CRC><cr>

Device: (XXXXXXXXXXXXXX<CRC><cr>

2.3 QSID<cr>: The device serial number inquiry (the length is more than 14)

Computer: QSID<CRC><cr>

Device: (NNXXXXXXXXXXXXXXXXXXXX<CRC><cr>

NN: Serial number valid length, X: Serial number, invalid part is filled as '0', total X is 20.

2.4 QVFW<cr>: Main CPU Firmware version inquiry

Computer: QVFW<CRC><cr>

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

N is a HEX number from 0...9 or A…F.

Example:

Computer: QVFW<CRC><cr>

Device: (VERFW:00123.01<CRC><cr>

00123: firmware series number；01: version

2.5 QVFW2<cr>: Scc CPU Firmware version inquiry

Computer: QVFW2<CRC><cr>

Device: (VERFW2:<NNNNN.NN><CRC><cr>

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

2.6 QVFW3<cr>: Remote Panel CPU Firmware version inquiry

Computer: QVFW3<CRC><cr>

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

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

2.7 ~~VERFW:<cr>: BLE CPU Firmware version inquiry （DSP get other cpu FV）~~

~~Computer: VERFW:<CRC><cr>~~

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

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

2.8 QPIRI<cr>: Device Rating Information inquiry

Computer: QPIRI<CRC><cr>

Device: (BBB.B CC.C DDD.D EE.E FF.F HHHH IIII JJ.J KK.K JJ.J KK.K LL.L O PPP QQQ O P Q R SS T U VV.V W X YYY ~~Z CCC~~ <CRC><cr>

Date	Description	Notes
(	Start byte	
BBB.B	AC output rating voltage	B is an integer ranging from 0 to 9. The units is V.
CC.C	AC output rating current	C is an Integer ranging from 0 to 9. The units is A.
DDD.D	AC output rating voltage	D is an Integer ranging from 0 to 9. The units is V.
EE.E	AC output rating frequency	E is an Integer ranging from 0 to 9. The units is Hz.
FF.F	AC output rating current	F is an Integer ranging from 0 to 9. The unit is A.
HHHH	AC output rating apparent power	H is an Integer ranging from 0 to 9. The unit is VA.
IIII	AC output rating active power	I is an Integer ranging from 0 to 9. The unit is W.
JJ.J	Battery rating voltage	J is an Integer ranging from 0 to 9. The

		units is V.
KK.K	Battery re-charge voltage	K is an Integer ranging from 0 to 9. The units is V.
JJ.J	Battery under voltage	J is an Integer ranging from 0 to 9. The units is V.
KK.K	Battery bulk voltage	K is an Integer ranging from 0 to 9. The units is V.
LL.L	Battery float voltage	L is an Integer ranging from 0 to 9. The units is V.
O	Battery type	0: AGM 1: Flooded 2: User 3: PYL 4: SH
PPP	Current max AC charging current	P is an Integer ranging from 0 to 9 The units is A.(PPP:only for MKS II/III to100A, PP：MKS II/III to 80A)
QQQ	Current max charging current	Q is an Integer ranging from 0 to 9. The units is A.
O	Input voltage range	0: Appliance 1: UPS
P	Output source priority	0: Utility first 1: Solar first 2: SBU first
Q	Charger source priority	0: Utility first 1: Solar first 2: Solar + Utility 3: Only solar charging permitted
R	Parallel max number	R is an Integer ranging from 0 to 9.
SS	Machine type	00: Grid tie; 01: Off Grid; 10: Hybrid.
T	Topology	0: transformerless 1: transformer
U	Output mode	00: single machine output 01: parallel output 02: Phase 1 of 3 Phase output 03: Phase 2 of 3 Phase output 04: Phase 3 of 3 Phase output
VV.V	Battery re-discharge voltage	V is an Integer ranging from 0 to 9. The unit is V.
W	PV OK condition for parallel	0: As long as one unit of inverters has

		connect PV, parallel system will consider PV OK; 1: Only All of inverters have connect PV, parallel system will consider PV OK
X	PV power balance	0: PV input max current will be the max charged current; 1: PV input max power will be the sum of the max charged power and loads power.
YYY	Max. charging time at C.V stage	Y is an Integer ranging from 0 to 9. The unit is minute. (only for KING & MKSII)
~~Z~~	~~Operation Logic~~	~~0: Automatically~~ ~~1: On-line mode~~ ~~2: ECO mode~~ ~~(only for KING)~~
~~CCC~~	~~Max discharging current~~	~~C is an integer ranging from 0 to 9. The units is A. (QGMN return 031)~~

2.9 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
b	Enable/Disable overload bypass function
~~e~~	~~Enable/Disable overload bypass function2 (only for KING)~~
~~d~~	~~Enable/Disable solar feed to grid (QGMN return 025)~~
k	Enable/Disable LCD display escape to default page after 1min timeout
~~m~~	~~Battery connect status(only for KING & MKSII)~~
u	Enable/Disable overload restart
v	Enable/Disable over temperature restart
x	Enable/Disable backlight on
y	Enable/Disable alarm on when primary source interrupt
z	Enable/Disable fault code record

Example:

Computer: QFLAG <CRC><cr>

Device: (ExxxDxxx <CRC><cr>

2.10 QPIGS<cr>: Device general status parameters inquiry

Computer: QPIGS <CRC><cr>

Device: (BBB.B CC.C DDD.D EE.E FFFF GGGG HHH III JJ.JJ KKK OOO TTTT EE.E UUU.U

WW.WW PPPPP b7b6b5b4b3b2b1b0 QQ VV MMMMM b10b9b8 <mark>~~Y ZZ AAAA~~</mark><CRC><cr>

Data	Description	Notes
(	Start byte	
BBB.B	Grid voltage	B is an Integer number 0 to 9. The units is V.
CC.C	Grid frequency	C s an Integer number 0 to 9. The units is Hz.
DDD.D	AC output voltage	D is an Integer number 0 to 9. The units is V.
EE.E	AC output frequency	E is an Integer number from 0 to 9. The units is Hz.
FFFF	AC output apparent power	F is an Integer number from 0 to 9. The units is VA
GGGG	AC output active power	G is an Integer ranging from 0 to 9. The units is W.
HHH	Output load percent	DEVICE: HHH is Maximum of W% or VA%. VA% is a percent of apparent power. W% is a percent of active power. The units is %.
III	BUS voltage	I is an Integer ranging from 0 to 9. The units is V.
JJ.JJ	Battery voltage	J is an Integer ranging from 0 to 9. The units is V.
KKK	Battery charging current	K is an Integer ranging from 0 to 9. The units is A.
OOO	Battery capacity	X is an Integer ranging from 0 to 9. The units is %.
TTTT	Inverter heat sink temperature	T is an integer ranging from 0 to 9. The units is °C.
EE.E	PV Input current	E is an Integer ranging from 0 to 9. The units is A. EEEE~~(only for KING)~~ ~~EE.E(only for VMIII & MKSII)~~
UUU.U	PV Input voltage	U is an Integer ranging from 0 to 9. The units is V.
WW.WW	Battery voltage from SCC	W is an Integer ranging from 0 to 9. The units is V.
PPPPP	Battery discharge current	P is an Integer ranging from 0 to 9. The units is A.
b7b6b5	Device status	b7: PV or AC feed the load, 1:yes,0:no

b4b3b2 b1b0		b6: configuration status: 1: Change 0: unchanged b5: SCC firmware version 1: Updated 0: unchanged b4: Load status: 0: Load off 1:Load on b3: reserved b2: Charging status(Charging on/off) b1: Charging status(SCC charging on/off) b0: Charging status(AC charging on/off) b2b1b0: 000: Do nothing 110: Charging on with SCC charge on 101: Charging on with AC charge on 111: Charging on with SCC and AC charge on
QQ	Battery voltage offset for fans on	Q is an Integer ranging from 0 to 9. The unit is 10mV.
VV	EEPROM version	V is an Integer ranging from 0 to 9.
MMM MM	PV Charging power	M is an Integer ranging from 0 to 9. The unit is watt.
b10b9b 8	Device status	b10: flag for charging to floating mode b9: Switch On b8: flag for dustproof installed(1-dustproof installed,0-no dustproof)
Y	Solar feed to grid status	0: normal 1: solar feed to grid QGMN return 025
ZZ	Set country customized regulation	00: India 01: Germany 02: South America QGMN return 025
AAAA	Solar feed to grid power	A is an Integer ranging from 0 to 9. The units is W. QGMN return 025

Fault Code	Fault Event	Icon on
01	Fan is locked	01 ERROR

02	Over temperature	
03	Battery voltage is too high	
04	Battery voltage is too low	
05	Output short circuited or Over temperature	
06	Output voltage is too high	
07	Over load time out	
08	Bus voltage is too high	
09	Bus soft start failed	
10	PV charger current over	
11	PV Over Volt	
12	DC-DC Over Current	
51	Over current inverter	
53	Inverter soft start failed	
55	Over DC voltage on output of inverter	
57	Current sensor failed	
58	Output voltage is too low	
59	PV voltage high	
60	Inverter negative power	(only for KING)
71	Parallel version different	
72	Output circuit failed	
73	Output Volt Different	
80	CAN communication failed	
81	Parallel host line lost	
82	Parallel synchronized signal lost	
83	Parallel battery voltage detect different	
84	Parallel Line voltage or frequency detect different	
85	Parallel Line input current unbalanced	
86	Parallel output setting different	

2.11 QMOD<cr>: Device Mode inquiry

Computer: QMOD<CRC><cr>

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Device: (M<CRC><cr>

MODE	CODE(M)
Power On Mode	P
Standby Mode	S
Line Mode	L
Battery Mode	B
Fault Mode	F
Shutdown Mode	D
Charge Mode	C
Bypass Mode	Y
ECO mode	E

Example:

Computer: QMOD<CRC><cr>

Device: (L<CRC><cr>

Means: the current device mode is Line mode.

2.12 QPIWS<cr>: Device Warning Status inquiry

Computer: QPIWS<CRC> <cr>

Device: (a0a1…..a34a35<CRC><cr>

a0… a35 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 loss(Reserved)	Warning
a1	Inverter fault	Fault
a2	Bus Over	Fault
a3	Bus Under	Fault
a4	Bus Soft Fail	Fault
a5	LINE_FAIL	Warning
a6	OPVShort	Fault
a7	Inverter voltage too low	Fault
a8	Inverter voltage too high	Fault
a9	Over temperature	Compile with a1, if a1=1,fault, otherwise warning
a10	Fan locked	Compile with a1, if a1=1,fault, otherwise warning
a11	Battery voltage high	Compile with a1, if a1=1,fault, otherwise warning
a12	Battery low alarm	Warning
a13	Reserved	
a14	Battery under shutdown	Warning

a15	Battery derating	Warning
a16	Over load	Compile with a1, if a1=1,fault, otherwise warning
a17	Eeprom fault	Warning
a18	Inverter Over Current	Fault
a19	Inverter Soft Fail	Fault
a20	Self Test Fail	Fault
a21	OP DC Voltage Over	Fault
a22	Battery Open	Fault
a23	Current Sensor Fail	Fault
a24	~~Battery Short~~(Reserved)	~~Fault(only for KING)~~
a25	~~Power limit~~(Reserved)	~~Warning(only for KING)~~
a26	PV voltage high	~~Warning/Fault(only for KING)~~
a27	~~MPPT overload fault~~ PV Over Current	Fault(~~only for KING~~)
a28	~~MPPT overload warning~~ (Reserved)	Warning(~~only for KING~~)
a29	~~Battery too low to charge~~ (Reserved)	Warning(~~only for KING~~)
a30	DC/DC Over Current	Fault(~~only for KING~~)
~~a31~~	~~D(remote)~~	==a32a33 is fault code(only for MKSIII)==
~~a32~~	~~D(remote)~~	~~a31a32 is fault code(only for VMIII)~~
~~a33~~	~~Low PV energy/D(remote)~~	~~Warning(only for VMIII)~~
~~a34~~	~~High AC input during BUS soft start(remote)~~	~~Warning(only for VMIII)~~
~~a35~~	~~Battery equalization(remote)~~	~~Warning(only for VMIII)~~

2.13 QDI<cr>: The default setting value information

Computer: QDI<CRC><cr>

Device: (BBB.B CC.C 00DD EE.E FF.F GG.G HH.H II J K L M N O P Q R S T U V W YY.Y X Z AAA ~~B~~<CRC><cr>

Data	Description	Notes	AXPERT
(	Start byte		
BBB.B	AC output voltage	B is an Integer ranging from 0 to 9. The units is V.	Default 230.0
CC.C	AC output frequency	C is an Integer ranging from 0 to 9. The units is Hz.	Default 50.0
00DD	Max AC charging current	D is an Integer ranging from 0 to 9. The unit is A.	Default 30.0
EE.E	Battery Under voltage	E is an Integer ranging from 0 to 9. The unit is V.	

FF.F	Charging float voltage	F is an Integer ranging from 0 to 9. The unit is V.	
GG.G	Charging bulk voltage	G is an Integer ranging from 0 to 9. The unit is V.	
HH.H	Battery default re-charge voltage	H is an Integer ranging from 0 to 9. The units is V.	
II	Max charging current	I is an Integer ranging from 0 to 9. The units is A.	60A
J	AC input voltage range	J is an Integer ranging from 0 to 1. No unit	Default 0 for appliance range
K	Output source priority	K is an Integer ranging from 0 to 1. No unit	Default 0 for utility first
L	Charger source priority	L is an Integer ranging from 0 to 1. No unit	Default 2 for Utility and Solar first
M	Battery type	M is an Integer ranging from 0 to 1. No unit	Default 0 for AGM
N	Enable/disable silence buzzer or open buzzer	N is an Integer ranging from 0 to 1. No unit	Default 0 for enable buzzer
O	Enable/Disable power saving	O is an Integer ranging from 0 to 1. No unit	Default 0 for disable power saving
P	Enable/Disable overload restart	P is an Integer ranging from 0 to 1. No unit	Default 0 for disable overload restart
Q	Enable/Disable over temperature restart	Q is an Integer ranging from 0 to 1. No unit	Default 0 for disable over temperature restart
R	Enable/Disable LCD backlight on	R is an Integer ranging from 0 to 1. No unit	Default 1 for enable LCD backlight on
S	Enable/Disable alarm on when primary source interrupt	S is an Integer ranging from 0 to 1. No unit	Default 1 for enable alarm on when primary source interrupt
T	Enable/Disable fault code record	T is an Integer ranging from 0 to 1. No unit	Default 0 for disable fault code record
U	Overload bypass	U is an Integer ranging from 0 to 1. No unit	Default 0 for disable overload bypass function

V	Enable/Disable LCD display escape to default page after 1min timeout	V is an Integer ranging from 0 to 1. No unit	Default 1 for LCD display escape to default page
W	Output mode	W is an Integer ranging from 0 to 4. No unit	Default 0 for single output
YY.Y	Battery re-discharge voltage	W is an Integer ranging from 0 to 9. The unit is V	
X	PV OK condition for parallel	X is an Integer ranging from 0 to 1	0: As long as one unit of inverters has connect PV, parallel system will consider PV OK;
Z	PV power balance	X is an Integer ranging from 0 to 1	0: PV input max current will be the max charged current;
AAA	Max. charging time at C.V stage	A is an Integer ranging from 0 to 9. The unit is Minutes.	0: means automatically ~~(only for KING & MKSII)~~
~~B~~	~~Operation logic~~	~~B is an Integer ranging from 0 to 1~~	~~0: automatically (only for KING)~~

2.14 QMCHGCR<cr>: Enquiry selectable value about max charging current

Computer: QMCHGCR<CRC><cr>

Device: (AAA BBB CCC DDD……<CRC><cr>

More value can be added, make sure there is a space character between every value.

2.15 QMUCHGCR<cr>: Enquiry selectable value about max utility charging current

Computer: QMUCHGCR<CRC><cr>

Device: (AAA BBB CCC DDD……<CRC><cr>

More value can be added, make sure there is a space character between every value.

~~2.16 QOPPT<cr>: The device output source priority time setting table~~

~~Computer: QOPPT<CRC><cr>~~

~~Device: (M M M M M M M M M M M M M M M M M M M M M M M M<CRC><cr>~~

~~M: 24 hour correspond to the output source priority (0: Utility first, 1: Solar first, 2: SBU)~~

~~2.17 QCHPT<cr>: The device charger source priority time setting table~~

~~Computer: QCHPT<CRC><cr>~~

Device: (M M M M M M M M M M M M M M M M M M M M M M M M M<CRC><cr>

M: 24 hour correspond to the charger source priority (1: Solar first, 2: Solar + Utility, 3: Only solar charging permitted)

2.18 QOPCHT<cr>: The device output source priority & charger source priority time setting

Computer: QOPCHT<CRC><cr>

Device: (A BB CC DD EE FF GG H II JJ KK LL MM NN a2a1a0 b2b1b0<CRC><cr>

Data	Description	Notes
(	Start byte	
A	Output source priority	0: Utility first 1: Solar first 2: SBU first
BB	USB starting time	B is an Integer number from 00 to 23. The units is Hour.
CC	USB end time	C s an Integer number from 00 to 23. The units is Hour.
DD	SUB starting time	D is an Integer number from 00 to 23. The units is Hour.
EE	SUB end time	E is an Integer number from 00 to 23. The units is Hour.
FF	SBU starting time	F is an Integer number from 00 to 23. The units is Hour.
GG	SBU end time	G is an Integer number from 00 to 23. The units is Hour.
H	Charger source priority	1: Solar first 2: Solar + Utility 3: Only solar charging permitted
II	Solar first starting time	I is an Integer number from 00 to 23. The units is Hour.
JJ	Solar first end time	J s an Integer number from 00 to 23. The units is Hour.
KK	Solar + Utility starting time	K is an Integer number from 00 to 23. The units is Hour.
LL	Solar + Utility end time	L is an Integer number from 00 to 23. The units is Hour.
MM	Only solar starting time	M is an Integer number from 00 to 23. The units is Hour.
NN	Only solar end time	N is an Integer number from 00 to 23. The units is Hour.
a2a1a0	Output source priority order	a2: highest a1: medium a0: lowest

b2b1b0	Charger source priority order	b2: highest
		b1: medium
		b0: lowest

2.19 QT<cr>: Time inquiry（remote）

Computer: QT<cr>

Device**:** (YYYYMMDDHHMMSS<cr>

Example:

Computer: QT<cr>

Device: (20180101111120<cr>

Means: The time is 2018/01/01 11:11:20.

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

2.20 QMN<cr>: Query model name

Computer: QMN<CRC><cr>

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

MMMMM: model name, NNNN: Rated output VA

2.21 QGMN<cr>: Query general model name

Computer: QGMN<CRC><cr>

Device: (NNN<CRC><cr> if Inverter accepts this command, otherwise, responds (NAK<cr>

NNN: model name number, list as below:

001	VP-5000	
002	VM-5000	
003	VP-3000	
004	VM-3000	
005	MKS+-2000-48-LV-LY	
006	MLV 3KVA	Axpert MLV 3K-24
007	PLV 3KVA	Axpert PLV 3K-24
008	MKS HV 24V 3KVA	Axpert MKS 3KP
009	KS HV 24V 3KVA	Axpert KS 3KP
010	MKS HV 24V 5KVA	Axpert MKS 5KP
011	KS HV 24V 5KVA	Axpert KS 5KP
012	MKS HV 48V 4K/5KVA/64V	Axpert MKS 4K/5K 64VDC

013	KS HV 48V 4/5KVA/64V	Axpert KS 4K/5K 64VDC
014	Axpert MKS 4/5KVA	Axpert MKS 4K/5K
015	Axpert KS 4/5KVA	Axpert KS 4K/5K
016	ALFA M-5000	ALFA M-5000
017	ALFA P-5000	ALFA P-5000
018	Axpert Plus Duo/Tri 5KVA	Axpert Plus Duo/Tri 5KVA
019	EPS 5KVA	Axpert EPS 5KW
020	EPS M5K	Axpert EPS M-5KW
021	EPS 3/3 5KW	Axpert EPS 33-5KW
022	AXPERT MKS II 5KW	Axpert MKS II 5KW
023	AXPERT KING 5KW	AXPERT KING 5KW
024	AXPERT KING 3KW	AXPERT KING 3KW
025	AXPERT MKS II 5KW	APT MKS II 5KW(Feed-in grid function)
026	Axpert MLV 5KW	Axpert MLV 5KW-48V
027	AXPERT VMIII	AXPERT VMIII
028	AXPERT VMIII	APT VMIII 3.2KW (Feed-in grid function)
029	AXPERT VMII	AXPERT VMII
030	AXPERT VMII	Fusion VMII (Feed-in grid function)
031	AXPERT MKS II 5KW	Phocos MKS II 5KW(Discharge current time function)
032	Axpert MKS	Axpert MKS Zero LV 0.7KW
033	Axpert MKS	Axpert MKS Zero LV 1.4KW
034	Axpert MKS	Axpert MKS Zero LV 2.6KW
035	AXPERT KING 5KW	AXPERT KING 5KW(Query PV generated and output load energy)
036	AXPERT KING 3KW	AXPERT KING 3KW(Query PV generated and output load energy)
037	AXPERT VMIII	AXPERT VMIII(Query PV generated and output load energy)
038	AXPERT MKS II 5KW	Phocos MKS II 5KW(Discharge current time function) (Query PV generated and output load energy)
039	AXPERT MKS II 5KW LV	Phocos MKS II 5KW LV(Discharge current time function)
040	Axpert SE 3.5K	
041	Axpert SE 5.5K	
042	AXPERT MKS III 5KW	
043	MAX3.6K	
044	MAX7.2K	

045	MAX5K LV	

2.22 QBEQI<cr>: Battery equalization status parameters inquiry

Computer: QBEQI<CRC><cr>

Device: (B CCC DDD EEE FFF GG.GG HHH III J KKKK<CRC><cr>

	Data	Description	Notes
a	(	Start byte	
b	B	Enable or Disable equalization	B is an Integer number 0 to 1.
C	CCC	equalization time	C s an Integer number 0 to 9. The unit is Minute.
D	DDD	equalization period	D is an Integer number 0 to 9. The unit is day.
E	EEE	equalization max current	E is an Integer number from 0 to 9. The unit is A.
F	FFF	reserved	reserved
G	GG.GG	equalization voltage	G is an Integer ranging from 0 to 9. The units is V.
H	HHH	reserved	reserved
I	III	equalization over time	I is an Integer ranging from 0 to 9. The unit is Minute.
j	J	equalization active status	J is an Integer ranging from 0 to 1.
k	KKKK	equalization elapse time	K is an Integer ranging from 0 to 9. The units is Hour.

2.23 QPGSn<cr>: Parallel Information inquiry （only for KING & MKSII）

Computer: QPGSn<CRC><cr>

Inverter: (A BBBBBBBBBBBBBB C DD EEE.E FF.FF GGG.G HH.HH IIII JJJJ KKK LL.L MMM NNN OOO.O PPP QQQQQ RRRRR SSS b7b6b5b4b3b2b1b0 T U VVV WWW ZZZ XX YYY<CRC><cr>

	Date	Description	Notes
A	(	Start byte	
B	A	The parallel num whether exist	0：No exist. 1：Exist.
C	BBBBBBBBBBBBBB	Serial number	B is an Integer ranging from 0 to 9.
D	C	Work mode	C is an character, refer to QMOD
E	DD	Fault code	D is an Integer ranging from 0 to 9.
F	EEE.E	Grid voltage	E is an Integer ranging from

			0 to 9. The units is V.
G	FF.FF	Grid frequency	F is an Integer ranging from 0 to 9. The unit is Hz.
H	GGG.G	AC output voltage	G is an Integer ranging from 0 to 9. The units is V.
I	HH.HH	AC output frequency	H is an Integer ranging from 0 to 9. The unit is Hz.
J	IIII	AC output apparent power	I is an Integer number from 0 to 9. The units is VA
K	JJJJ	AC output active power	J is an Integer ranging from 0 to 9. The units is W.
L	KKK	Load percentage	K is an Integer ranging from 0 to 9. The units is %.
M	LL.L	Battery voltage	L is an Integer ranging from 0 to 9. The unit is V.
N	MMM	Battery charging current	M is an Integer ranging from 0 to 9. The units is A.
O	NNN	Battery capacity	N is an Integer ranging from 0 to 9. The units is %.
P	OOO. O	PV Input Voltage	O is an Integer ranging from 0 to 9. The units is V.
Q	PPP	Total charging current	P is an Integer ranging from 0 to 9. The units is A.
R	QQQQQ	Total AC output apparent power	Q is an Integer ranging from 0 to 9. The units is VA.
S	RRRRR	Total output active power	R is an Integer ranging from 0 to 9. The units is W.
T	SSS	Total AC output percentage	S is an Integer ranging from 0 to 9. The units is %.

U	b7b6b5b4b3b2b1b0	Inverter Status	b7: 1 SCC OK, 0 SCC LOSS
			b6: 1 AC Charging
			    0 AC no charging
			b5: 1 SCC Charging
			    0 SCC no charging
			b4b3: 2 battery open, 1 battery under, 0 battery normal
			b2: 1 Line loss, 0 Line ok
			b1: 1 load on, 0 load off
			b0: configuration status:
			    1: Change 0: unchanged

V	T	Output mode	0: single machine 1: parallel output 2: Phase 1 of 3 phase output 3: Phase 2 of 3 phase output 4: Phase 3 of 3 phase output
W	U	Charger source priority	0: Utility first 1: Solar first 2: Solar + Utility 3: Solar only
X	VVV	Max charger current	V is an Integer ranging from 0 to 9. The units is A.
Y	WWW	Max charger range	W is an Integer ranging from 0 to 9. The units is A.
Z	ZZZ	Max AC charger current	Z is an Integer ranging from 0 to 9. The units is A.
a	XX	PV input current	X is an Integer ranging from 0 to 9. The units is A.
b	YYY	Battery discharge current	Y is an Integer ranging from 0 to 9. The units is A.

2.24 Q2PGSn<cr>: Parallel Information inquiry (QGMN return 025)

Computer: Q2PGSn<CRC><cr>

Inverter: (A BBBB C DDDD<CRC><cr>

	Date	Description	Notes
A	(	Start byte	
B	A	The parallel num whether exist	0: No exist. 1: Exist.
C	BBBB	PV input power	B is an Integer ranging from 0 to 9. The unit is W.
D	C	Solar feed to grid status	0: normal 1: solar feed to grid
E	DDDD	Solar feed to grid power	A is an Integer ranging from 0 to 9. The units is W.

2.25 QET<CRC><cr>: Query total PV generated energy （remote）

Computer: QET<CRC><cr>

Device: (NNNNNNNN<CRC><cr>

NNNNNNNN: Generated energy, N: 0~9, unit: Wh

2.26 QEYyyyy<CRC><cr>: Query PV generated energy of year （remote）

Computer: QEYyyyy<cr>

Device: (NNNNNNNN<CRC><cr>

yyyy: Year, y: 0~9

NNNNNNNN: Generated energy, N: 0~9, unit: Wh

2.27 QEMyyyymm<CRC><cr>: Query PV generated energy of month（remote）

Computer: QEMyyyymm <CRC><cr>

Device: (NNNNNNNN<CRC><cr>

yyyy: Year, y: 0~9

mm: Month, m: 0~9

NNNNNNNN: Generated energy, N: 0~9, unit: Wh

2.28 QEDyyyymmdd<CRC><cr>: Query PV generated energy of day（remote）

Computer: QEDyyyymmdd<CRC><cr>

Device: (NNNNNNNN<CRC><cr>

yyyy: Year, y: 0~9

mm: Month, m: 0~9

dd: Day, d: 0~9

NNNNNNNN: Generated energy, N: 0~9, unit: Wh

2.29 QLT<CRC><cr>: Query total output load energy（remote）

Computer: QLT<CRC><cr>

Device: (NNNNNNNN<CRC><cr>

NNNNNNNN: Output load energy, N: 0~9, unit: Wh

2.30 QLYyyyy<CRC><cr>: Query output load energy of year（remote）

Computer: QLYyyyy<CRC><cr>

Device: (NNNNNNNN<CRC><cr>

yyyy: Year, y: 0~9

NNNNNNNN: Output load energy, N: 0~9, unit: Wh

2.31 QLMyyyymm<CRC><cr>: Query output load energy of month（remote）

Computer: QLMyyyymm<CRC><cr>

Device: (NNNNNNNN<CRC><cr>

yyyy: Year, y: 0~9

mm: Month, m: 0~9

NNNNNNNN: Output load energy, N: 0~9, unit: Wh

2.32 QLDyyyymmdd<CRC><cr>: Query output load energy of day（remote）

Computer: QLDyyyymmdd<CRC><cr>

Device: (NNNNNNNN<CRC><cr>

yyyy: Year, y: 0~9

mm: Month, m: 0~9

dd: Day, d: 0~9

NNNNNNNN: Output load energy, N: 0~9, unit: Wh

2.33 ~~QBATCD<cr>: Discharge status and Charge status inquiry (QGMN return 031,038,039)~~

~~Computer: QBATCD<CRC><cr>~~

~~Device: (abc<CRC><cr>~~

~~a = Discharge completely on/off~~

~~b = Discharge on/off, but standby allowed (so small discharge allowed)~~

~~c = Charge completely on/off~~

2.34 QBMS<CRC><cr>: BMS message

Computer: QBMS<CRC><cr>

Device: (AAAA BBB C DDDD EE F GGGG HHHH IIII J K LLLL MMMM\<CRC>\<cr>

2.35 PBMS\<CRC>\<cr>: BMS message

Remote box: PBMSa bbb c d e fff ggg hhh iiii jjjj\<CRC>\<cr>

Device**:** (ACK\<CRC>\<cr>

Data	Description	Notes
(	Start byte	
a	Battery connect status	0: connect, 1: disconnect.
bbb	Battery percentage	b is an Integer ranging from 0 to 9. The units is %.
c	Force AC charge battery in any case	0: Do not force, 1: Force.
d	Battery stop discharge flag	0: Enable discharge, 1: disable discharging
e	Battery stop charge flag	0: Enable charge, 1: disable charging
fff	Battery C.V. charging voltage	f is an Integer ranging from 0 to 9. The units is V.
ggg	Battery floating charging voltage	g is an Integer ranging from 0 to 9. The units is V.
hhh	Battery cut-off voltage	h is an Integer ranging from 0 to 9. The units is V.
iiii	Battery max. charging current	i is an Integer ranging from 0 to 9. The units is A.
jjjj	Battery max. discharging current	j is an Integer ranging from 0 to 9. The units is A.

2.36 ~~QLED\<CRC>\<cr>: LED status parameters inquiry~~

~~Computer: QLED \<CRC>\<cr>~~

~~Device**:** (A B C D E aaabbbccc1 … aaabbbcccd \<CRC>\<cr>~~

~~Data~~	~~Description~~	~~Notes~~
~~(~~	~~Start byte~~	
~~A~~	~~Enable or Disable~~	~~A is an Integer number 0 to 1.~~
~~B~~	~~LED speed~~	~~B is an Integer ranging from 0 to 3. 0 means low; 1 means medium; 2 means fast~~
~~C~~	~~LED effect~~	~~C is an Integer ranging from 0 to 6. 0 means breathing; 1 means flashing; 2 means solid; 3 means right scrolling; 4 means left scrolling; 5 means right spark; 6 means left spark~~
~~D~~	~~LED brightness~~	~~E is an Integer ranging from 1 to 9.~~
~~E~~	~~Total number of colors~~	~~D is an Integer ranging from 1 to 3.~~

~~aaabbbcc c1… aaabbbcc cd~~	~~aa means red, bb means green, cc means blue~~	~~aaa1, bbb1, ccc1… aaad, bbbd, cccd is an Integer ranging from 0 to 255.~~

3   Setting parameters Command

3.1   ATE1<CRC><cr>: Start ATE test, remote panel stop polling

3.2   ATE0: End ATE test, remote panel polling

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

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

Device: (ACK<CRC><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
b	Enable/disable overload bypass
c	~~Enable/Disable overload bypass function2 (only for KING)~~
d	Enable/Disable solar feed to grid
k	Enable/Disable LCD display escape to default page after 1min timeout
u	Enable/Disable overload restart
v	Enable/Disable over temperature restart
x	Enable/Disable backlight on
y	Enable/Disable alarm on when primary source interrupt
z	Enable/Disable fault code record

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

Computer: PF<CRC><cr>

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

All Device parameters set to default value.

x	Parameter setting	
	Parameter	Default value
1	AC output voltage	230.0V
2	AC output frequency	50.0Hz
3	Max charging current	60A
	Max utility charging current	30A
4	AC input voltage range	0: Appliance range
5	Output source priority	0: Utility first
6	Battery re-charge voltage	11.5/23/46 for 12/24/48V unit.

7	Charger source priority	2: Utility and Solar first
8	Battery type	0: AGM
9	Enable/disable buzzer alarm	1: Enable buzzer alarm
10	Enable/Disable power saving	0: Disable power saving
11	Enable/Disable overload restart	0: Disable overload restart
12	Enable/Disable over temperature restart	0: Disable over temperature restart
13	Enable/Disable LCD backlight on	1: Enable LCD backlight on
14	Enable/Disable alarm on when primary source interrupt	1: Enable beep on when primary source interrupt
15	Enable/Disable overload bypass when overload happened in battery mode	0: Disable overload bypass
16	Enable/Disable LCD display escape to default page after 1min timeout	1: Enable LCD display escape to default page
17	Output mode	0: Reserved
18	float charging voltage	13.5/27/54 for 12/24/48V unit.
19	Bulk charging voltage	14.1/28.2/56.4 for 12/24/48V unit.
20	Battery cut-off voltage	10.5/21/42 for 12/24/48V unit.
21	Battery re-discharge voltage	13.5/27/54 for 12/24/48V unit.

Note: The correct default value can be gain by QDI command.

3.5 MNCHGC<nnn><cr>: Setting max charging current

Computer: MNCHGC<nnn><CRC><cr> (only for VMIII)

Computer: MNCHGC<mnnn><CRC><cr> (only for KING & MKSII)

Computer: MNCHGC<mnnn><CRC><cr>

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

Setting value can be gain by QMCHGCR command.

nnn is max charging current, m is parallel number.

3.6 MUCHGC<nnn><cr>: Setting utility max charging current

Computer: MUCHGC<nnn><CRC><cr> (only for VMIII)

Computer: MUCHGC<mnn><CRC><cr> (only for KING)

Computer: MUCHGC<mnnn><CRC><cr> (only for MKSII)

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

Setting value can be gain by QMUCHGCR command.

nn is max charging current m is parallel number

3.7 F<nn><cr>: Setting Inverter output rating frequency

Computer: F<nn><CRC><cr>

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

Set UPS output rating frequency to 50Hz.or 60Hz

3.8 POPV<nnnn><cr>: Setting device output rating voltage

Computer: POPV<nnnn><CRC><cr>

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

Set inverter output rating voltage to 220V/230V/240V(2200/2300/2400)

3.9 POP<NN><cr>: Setting device output source priority

Computer: POP<NN><CRC><cr>

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

Set output source priority, 00 for utility first, 01 for solar first, 02 for SBU priority

3.10 POPM<nn><cr>: Setting output mode

Computer: POPM<nn><CRC><cr>

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

nn:00: single machine output, 01: parallel output, 02: Phase 1 of 3 Phase output, 03: Phase 2 of 3 Phase output, 04: Phase 3 of 3 Phase output

3.11 ~~POPLG<nn><cr>: Setting operation logic (only for KING)~~

~~Computer: POPLG<nn><CRC><cr>~~

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

~~nn:00: automatically, 01: On-line mode, 02: ECO mode~~

3.12 PBCV<nn.n><cr>: Battery voltage back to utility

Computer: PBCV<nn.n><CRC><cr>

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

~~24V unit: 22V~25.5V (only for VMIII); 22V~28.5V (only for KING)~~

~~48V unit: 44V~51V (only for VMIII); 44V~57V (only for KING & MKSII)~~

3.13 PBDV<nn.n><cr>: Battery voltage back to battery

Computer: PBDV<nn.n><CRC><cr>

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

~~24V unit: 24V~29V (only for VMIII); 24V~33V (only for KING)~~

~~48V unit: 48V~58V (only for VMIII); 48V~64V (only for KING & MKSII)~~

00.0V means battery is full (charging in float mode).

3.14 PCP<NN><cr>: Setting device charger priority

Computer: PCP<NN><CRC><cr>

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

01 for solar first, 02 for solar and utility, 03 for only solar charging (only for VMIII & MKSII); 00 for SBL/UCB, 01 for SBL/UDC, 02 for SLB/UCB, 03 for SLB/UDC (only for KING)

3.15 PPCP<MNN><cr>: Setting device charger priority

Computer: PPCP<MNN><CRC><cr>

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

m is parallel number.

01 for solar first, 02 for solar and utility, 03 for only solar charging (only for MKSII); 00 for SBL/UCB, 01 for SBL/UDC, 02 for SLB/UCB, 03 for SLB/UDC (only for KING)

3.16 PGR<NN><cr>: Setting device grid working range

Computer: PGR<NN><CRC><cr>

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

Set device grid working range, 00 for appliance, 01 for UPS

3.17 PBT<NN><cr>: Setting battery type

Computer: PBT<NN><CRC><cr>

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

Set device grid working range, 00 for AGM, 01 for Flooded, 02 for user-define battery type, 03 for Pylontech, 04 for Shinheung, 05 for WECO, 06 for Soltaro

3.18 PSDV<nn.n><cr>: Setting battery cut-off voltage (Battery under voltage)

Computer: PSDV<nn.n><CRC><cr>

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

24V unit: 21V~24V (only for VMIII); 20V~27V (only for KING)

48V unit: 42V~48V (only for VMIII); 40V~54V (only for KING & MKSII)

3.19 PCVV<nn.n><cr>: Setting battery C.V. (constant voltage) charging voltage

Computer: PCVV<nn.n><CRC><cr>

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

24V unit: 25V~31.5V (only for VMIII); 24V~32V (only for KING)

48V unit: 48V~61V (only for VMIII); 48V~64V (only for KING & MKSII)

3.20 PBFT<nn.n><cr>: Setting battery float charging voltage

Computer: PBFT<nn.n><CRC><cr>

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

24V unit: 25V~31.5V (only for VMIII); 24V~32V (only for KING)

48V unit: 48V~61V (only for VMIII); 48V~64V (only for KING & MKSII)

3.21 BTA1<nnn.nn><cr>: Battery voltage adjust point one

Computer: BTA1<nnn.nn><CRC><cr>

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

3.22 BTA2<nnn.nn><cr>: Battery voltage adjust point two

Computer: BTA2<nnn.nn><CRC><cr>

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

When: when Inverter accepts this command, Inverter adjust battery voltage by point one and point two.

3.23 BTA0<cr>: Set battery voltage adjust parameters to be default value

Computer: BTA0<CRC><cr>

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

3.24 PPVOKC<n ><cr>: Setting PV OK condition

Computer: PPVOKC <n><CRC><cr>

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

0: As long as one unit of inverters has connected PV, parallel system will consider PV OK;

1: Only all of inverters have connected PV, parallel system will consider PV OK.

3.25 PSPB<n ><cr>: Setting Solar power balance

Computer: PSPB<n><CRC><cr>

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

0: PV input max current will be the max charged current;

1: PV input max power will be the sum of the max charged power and loads power.

3.26 RTEY<cr>: Reset all stored data for PV/load energy（remote）

Computer: RTEY <CRC><cr>

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

3.27 RTDL<cr>: Erase all data log（remote）

Computer: RTDL <CRC><cr>

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

3.28 PDL<nn><cr>: Data log stored period（remote）

Computer: PDLnn<CRC><cr>

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

nn is 3, 5, 10, 20 ,30, 60. The units is Minutes.

3.29 PBEQE<n><cr>: Enable or disable battery equalization

Computer: PBEQE<n><CRC><cr>

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

Enable or Disable battery equalization, n=1 means enable; n=0 means disable;

3.30 PBEQT<nnn><cr>:Set battery equalization time

Computer: PBEQT<nnn><CRC><cr>

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

Set equalization time, nnn is in the range of 5 to 900minute, every click increase or decrease 5minute.

3.31 PBEQP<nnn><cr>:Set battery equalization period

Computer: PBEQP<nnn><CRC><cr>

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

Set equalization period, nnn is in the range of 0 to 90day, every click increase or decrease 1day.

3.32 PBEQV<nn.nn><cr>:Set battery equalization voltage

Computer: PBEQV<nn.nn><CRC><cr>

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

Set equalization time, nn.nn is in the range as below.

24V unit: 25V~31.5V (only for VMIII); 24V~32V (only for KING)

48V unit: 48V~61V (only for VMIII); 48V~64V (only for KING & MKSII)

3.33 PBEQOT<nnn><cr>:Set battery equalization over time

Computer: PBEQOT<nnn><CRC><cr>

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

Set equalization time, nnn is in the range of 5 to 900minute, every click increase or decrease 5minute.

3.34 PBEQA<n><cr>: Active or inactive battery equalization now

Computer: PBEQA<n><CRC><cr>

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

Active or inactive battery equalization now, n=1 means active; n=0 means inactive;

3.35 PCVT<nnn><cr>: Set max charging time at C.V stage

Computer: PCVT<nnn><CRC><cr>

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

3.36 SRS<nn><cr>: Set country customized regulation

Computer: SRS<nn><CRC><cr>

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

nn:00: India, 01: Germany, 02: South America

3.37 DAT<yymmddhhmmss><cr>: Date and time

Computer: DAT<yymmddhhmmss><CRC><cr> <Y, M, D, H, S> is an integer number 0 to 9

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

3.38 PBATMAXDISC<nnn><cr>: Setting max discharging current (QGMN return 031,038,039)

Computer: PBATMAXDISC<nnn><CRC><cr>

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

nnn is max discharging current, and the unit is A. The acceptable value of the setting is 0A, 30A, 40A, 50A, 60A, 70A, 80A, 90A, 100A, 110A, 120A. The system sets 000 as the default value of max discharging current, and the protection of this function disables at the same time. The protection enables if users set the acceptable value (030, 040, 050, 060, 070, 080, 090, 100, 110, 120) of max discharging current. On the other hand, the protection disables if users set the acceptable value (000) of max discharging current.

3.39 PBATCD<abc><cr>: Battery charge/discharge controlling command (QGMN return 031,038,039)

Computer: PBATCD<abc><CRC><cr>

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

a = Discharge completely on/off

b = Discharge on/off, but standby allowed (so small discharge allowed)

c = Charge completely on/off

Detail:

abc:

	Charger	Discharger
1 1 1	N/A	N/A
0 1 1	Enabled charger, depends on Prog16 setting if AC source valid, charge 2A from AC, even if prog. 16 is "only solar". If prog. 16 is any other setting, ignore and let charging from AC source continue normally.	Enabled discharger and shut down unit completely when insufficient PV or Grid is present.
1 0 1	Enabled charger, depends on Prog16 setting if AC source valid, charge 2A from AC, even if prog. 16 is "only solar". If prog. 16 is any other setting, ignore and let charging from AC source continue normally.	Enabled discharger but keep unit stay at standby mode.
1 1 0	Disabled charger	N/A
0 1 0	Disabled charger	Enabled discharger and shut down unit completely when no PV or Grid is present.
1 0 0	Disabled charger	Enabled discharger but keep unit stay at standby mode.
0 0 1	N/A	N/A
0 0 0	N/A	N/A

3.40 PLEDE<n><cr>: Enable/disable LED function

Computer: PLEDE<n><cr>

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

n: 0 means disable; 1 means enable

3.41 PLEDS<n><cr>: set LED speed

Computer: PLEDS<n><cr>

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

n: 0 means low; 1 means normal; 2 means fast

3.42 PLEDM<n><cr>: set LED effect

Computer: PLEDM<n><cr>

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

n: 0 means breathing; 2 means solid; 3 means scrolling

3.43 PLEDB<n><cr>: set LED brightness

Computer: PLEDB<n><cr>

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

n: 1 means low; 5 means normal; 9 means fast

3.44 PLEDT<n><cr>: set LED total number of colors

Computer: PLEDT<n><cr>

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

n means total number of colors, 2 means battery discharge/charge status; 3 means energy source

3.45 PLEDC\<n\>\<aaabbbccc\>\<cr\>: set LED color

Computer: PLEDC\<n\>\<aaabbbccc\>\<cr\>

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

n means total number of colors, 2 means battery discharge/charge status; 3 means output source

aaa, bbb, ccc means RGB, between 0 and 255

For example:

Computer: PLED1148000211\<cr\>, mean set C01 (Violet-White-Sky blue)

UPS: (ACK\<cr\>

Computer: PLED1255255255\<cr\>, mean set C02 (White-Yellow-Green)

UPS: (ACK\<cr\>

Computer: PLED1255000147\<cr\>, mean set C01 (Pink-Honey)

UPS: (ACK\<cr\>

Computer: PLED1000000255\<cr\>, mean set C02 (Royal blue-Lime yellow)

UPS: (ACK\<cr\>

4   Appendix

4.1   CRC calibration method

CRC. c