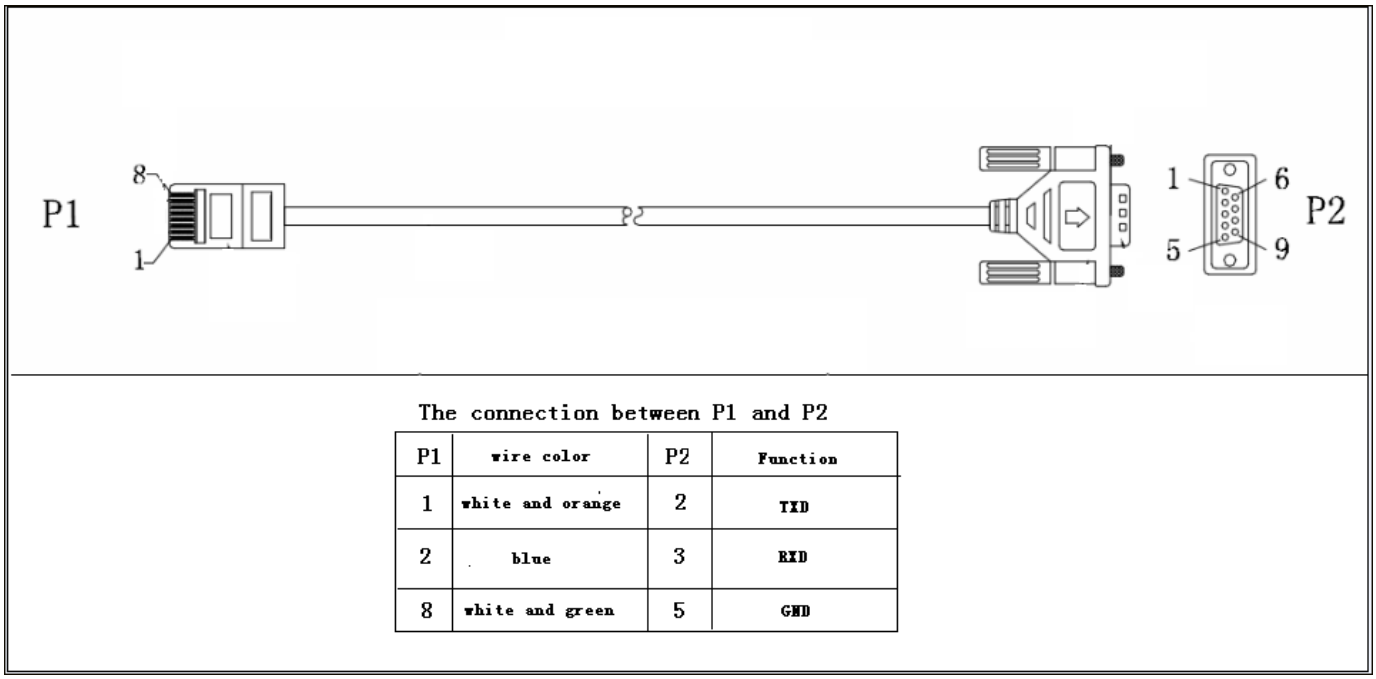
MPPT-3000 Standard RS232 communication Protocol

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, 34 used for MPPT-3K-Standard.

Function: To request the device Protocol ID.

2.2 QID<cr>: The device serial number inquiry

Computer: QID <CRC><cr>

Device: (XXXXXXXXXXXXXX <CRC><cr>

2.3 QVFW<cr>: MPPT 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

2.4 QPIRI<cr>: Device Rated Information inquiry

Computer: QPIRI<CRC><cr>

Device: (BBBB CC DD.D EE.EE FF.FF GG HH II.I JJ KKKK L MM.MM N<CRC><cr>

	Date	Description	Notes
A	(	Start byte	
B	BBBB	Max. Output Power	B is an integer ranging from 0 to 9. The units is W.
C	CC	Nominal Battery Voltage	C is an Integer ranging from 0 to 9. The units is V.
D	DD.D	Nominal Charging Current	D is an Integer ranging from 0 to 9. The units is A.
E	EE.EE	Absorption Voltage per unit	E is an Integer ranging from 0 to 9. The units is V.
F	FF.FF	Float Voltage per unit	F is an Integer ranging from 0 to 9. The unit is V.
G	GG	Battery Type	G is an Integer ranging from 0 to 9. 00: AGM 01: Flooded 02: Customized
H	HH	Remote Battery Voltage Detect	H is an Integer ranging from 0 to 9. 00: Remote battery sensing disable 01: Remote battery sensing enable
I	±II.I	Battery Temperature Compensation	I is an Integer ranging from 0 to 9. The unit is mV.
J	JJ	Remote Temperature Detect	J is an Integer ranging from 0 to 9. 00: Remote temperature sensing disable 01: Remote temperature sensing enable
K	KK	Battery rated voltage set	00: Enable battery voltage auto sensing

			01: Set rated battery voltage 12V 02: Set rated battery voltage 24V 03: Set rated battery voltage 36V (Reserved) 04: Set rated battery voltage 48V
L	L	The piece of battery in serial	L is an Integer ranging from 1 to 4.
M	MM.MM	Battery low warning voltage	L is an Integer ranging from 0 to 9.
N	N	Battery low shutdown detect	0:disable 1: enable

2.5 QPIGS<cr>: Device general status parameters inquiry

Computer: QPIGS <CRC><cr>

Device: (BBB.B CC.CC DD.DD EE.EE FF.FF GGGG ±HHH II.II ±JJJ KKKK b7b6b5b4b3b2b1b0 <CRC><cr>

	Data	Description	Notes
A	(	Start byte	
B	BBB.B	PV input voltage	B is an Integer number from 0 to 9. The unit is V.
C	CC.CC	Battery voltage	C is an Integer number from 0 to 9. The unit is V.
D	DD.DD	Charging current	D is an Integer number from 0 to 9. The unit is A.
E	EE.EE	Charging current1	E is an Integer number from 0 to 9. The unit is A.
F	FF.FF	Charging current2	F is an Integer number from 0 to 9. The unit is A.
G	GGGG	Charging power	F is an Integer number from 0 to 9. The unit is W.
H	±HHH	Unit temperature	G is an integer number from 0 to 9. The unit is ℃.
I	II.II	Remote battery voltage (Optional)	L is an Integer number from 0 to 9.
J	±JJJ	Remote battery temperature(Optional)	M is an integer ranging from 0 to 9.
K	KKKK	Reserved	Reserved
L	b7-b0	Status	b7: 1 means parameter have modified. 0 means parameter have not modified. b6: 1 means charger working 0 means charger isn't work b5-b0: Reserved

2.6 QDI<cr>: The default setting value information

Computer: QDI<CRC><cr>

Device: (BB CC.C DD EE.EE FF.FF GG ±HH.H IIII<CRC><cr>

	Data	Description	Notes	
A	(	Start byte		
B	BB	Battery rated voltage set 00	00: Enable battery voltage auto sensing 01: Set rated battery voltage 12V 02: Set rated battery voltage 24V 03: Set rated battery voltage 36V (Reserved) 04: Set rated battery voltage 48V	
C	CC.C	Max. charging current 60.0A	C is an Integer number from 0 to 9. The unit is A.	
D	DD	Battery type 00 - AGM	D is an Integer ranging from 0 to 9. 00: AGM 01: Flooded 02: Customized	
E	EE.EE	Absorption voltage 14.30V	E is an Integer number from 0 to 9. The unit is V.	
F	FF.FF	Floating voltage 13.40V	F is an Integer number from 0 to 9. The unit is V.	
G	GG	00 – Remote battery voltage detect disable	G is an Integer number from 0 to 9.	
H	±HH.H	BTS temperature compensation ratio 00.0mV	H is an Integer number from 0 to 9. The unit is mV.	
I	IIII	Reserved	Reserved	

2.7 QPIWS<cr>: Device Warning Status inquiry

Computer: QPIWS<CRC> <cr>

Device: (a1a2…..a14a15-a30<CRC><cr>

a1,…, a30 is the warning status. If the warning happened, the relevant bit will set to 1, else the relevant bit will set 0. The following table is the warning code.

bit	**Warning**	Description
a1	Over charge current	Fault
a2	Over temperature	Fault
a3	Battery voltage under	Fault
a4	Battery voltage high	Fault
a5	PV high loss	Fault

a6	Battery temperature too low	Fault
a7	Battery temperature too high	Fault
a8	Reserved	Reserved
a9	Reserved	Reserved
a10	Reserved	Reserved
a11	Reserved	Reserved
a12	Reserved	Reserved
a13	Reserved	Reserved
a14	Reserved	Reserved
a15	Reserved	Reserved
a16	Reserved	Reserved
a17	Reserved	Reserved
a18	Reserved	Reserved
a19	Reserved	Reserved
a20	PV low loss	Warning
a21	PV high derating	Warning
a22	Temperature high derating	Warning
a23	Battery temperature low alarm	Warning
a30	Battery low warning	Just for AS400 card

2.1 QBEQI<cr>: The battery equalized information

Computer: QBEQI<CRC><cr>

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

	Data	Description	Notes	
A	(	Start byte		
B	B	Battery equalized enable/disable	0: Enable, 1:disable	
C	CCC	Battery equalized time	C is an Integer number from 0 to 9. The unit is minute.	
D	DDD	Interval time of battery equalization	D is an Integer ranging from 0 to 9. The unit is day.	
E	EEE	The max current of battery equalization.	E is an Integer number from 0 to 9. The unit is A.	
F	FFF	The remaining time for the next equalization.	F is an Integer ranging from 0 to 9. The unit is day.	
G	GG.GG	Battery equalized voltage per unit	G is an Integer ranging from 0 to 9. The unit is V.	
H	HHH	Battery C.V. charge time	H is an Integer ranging from 0 to 9. The unit is minute.	

I	III	The time of battery equalized timeout	I is an Integer ranging from 0 to 9. The unit is minute.	

3 Setting parameters Command

3.1 ID< XXXXXXXXXXXXXX ><cr>: Setting device serial number

Computer: ID< XXXXXXXXXXXXXX ><CRC><cr>

Device: (ACK<CRC><cr> if device accepted, or respond (NAK<CRC><cr>

3.2 PBT<TT><cr>: Setting battery type

Computer: PBT<TT ><CRC><cr>

Device: (ACK<CRC><cr> if device accepted, or respond (NAK<CRC><cr>

Set device working range in line mode, 00 for AGM, 01 for Flooded battery

TT(Battery Type)		AA.A(Absorption)			FF.F(Floating)		
		12V	24V	48V	12V	24V	48V
00	AGM	14.1	28.2	56.4	13.5	27.0	54.0
01	Flooded	14.6	29.2	58.4	13.5	27.0	54.0
02	Customized						

3.3 PBAV< AA.AA ><cr>: Setting battery absorption charging voltage

Computer: PBAV<AA.AA ><CRC><cr>

Device: (ACK<CRC><cr> if device accepted, or respond (NAK<CRC><cr>

AA.AA - C.V voltage per cell

Battery Type	AA.AA(Absorption)
	12V/24V48V
Customized	aa.aa

aa.aa - Voltage set by user(12.00V~15.00V), active on customized battery type.

3.4 PBFV< FF.FF><cr>: Setting battery floating charging voltage

Computer: PBFV<FF.FF><CRC><cr>

Device: (ACK<CRC><cr> if device accepted, or respond (NAK<CRC><cr>

FF.FF - Floating voltage per cell

Battery Type	FF.FF(Floating)
	12V/24V/48V
Customized	ff.ff

ff.ff - Voltage set by user(12.00V~15.00V) , activated on customized battery type.

3.5 PBRV<NN><cr>: Setting rated battery voltage

Computer: PBRV<NN><CRC><cr>

Device: (ACK<CRC><cr> if device accepted, or respond (NAK<CRC><cr>

00: Enable battery voltage auto sensing
01: Set rated battery voltage 12V
02: Set rated battery voltage 24V
03: Set rated battery voltage 36V (Reserved)
04: Set rated battery voltage 48V

3.6 MCHGC<NNN><cr>: Setting max charging current

Computer: MCHGC<NNN><CRC><cr>
Device: (ACK<CRC><cr> if device accepted, or respond (NAK<CRC><cr>
NNN is from 010 ~ 060 for MPPT-3000-Standard, unit is A.

3.7 PTSO±<NN.N><cr>: Setting BTS temperature compensation ratio

Computer: PTSO±<NN.N><CRC><cr>
Device: (ACK<CRC><cr> if device accepted, or respond (NAK<CRC><cr>
NN.N: -10.0mV – 10.0mV

3.8 PRBD<NN><cr>: Enable/disable remote battery voltage detect

Computer: PRBD<NN><CRC><cr>
Device: (ACK<CRC><cr> if device accepted, or respond (NAK<CRC><cr>
00 - Disable remote battery voltage detect
01 - Enable remote battery voltage detect

3.9 PBLV<nn.nn><cr>: Set battery low warning voltage

Computer: PBLV< nn.nn ><CRC><cr>
Device: (ACK<CRC><cr> if device accepted, or respond (NAK<CRC><cr>
nn.nn 10.00~12.50V

3.10 PBLSEn<cr>: Set battery low shutdown detect enable/disable

Computer: PBLSEn <CRC><cr>
Device: (ACK<CRC><cr> if device accepted, or respond (NAK<CRC><cr>
n: 0 means disable, 1 means enable

3.11 PBEQEn<cr>: Set battery equalization enable/disable.

Computer:PBEQEn<CRC><cr>
Device: (ACK<CRC><cr> if device accepted, or respond (NAK<CRC><cr>
n: 0 means disable, 1 means enable

3.12 PBEQT<nnn><cr>: Set battery equalized time.

Computer:PBEQT<nnn><CRC><cr>
Device: (ACK<CRC><cr> if device accepted, or respond (NAK<CRC><cr>

nnn:5~300, the unit is minute.

3.13 PBEQP<nnn><cr>: Set the period of battery equalization.

Computer:PBEQP<nnn><CRC><cr>
Device: (ACK<CRC><cr> if device accepted, or respond (NAK<CRC><cr>
nnn:0~060, the unit is days. 0 means battery equalization function only activate by key.

3.14 PBEQMC<nnn><cr>: Set the max current of battery equalization.

Computer:PBEQMC<nnn><CRC><cr>
Device: (ACK<CRC><cr> if device accepted, or respond (NAK<CRC><cr>
nnn:005~060, the unit is A. this value must less than max charged current.

3.15 PBEQV<nn.nn><cr>: Set battery equalized voltage.

Computer:PBEQV<nn.nn><CRC><cr>
Device: (ACK<CRC><cr> if device accepted, or respond (NAK<CRC><cr>
nn.n:12.00~15.50, the unit is V. this value must more than bulk voltage.

3.16 PBCVT<nnn><cr>: Set battery C.V. charge time.

Computer:PBCVT<nnn><CRC><cr>
Device: (ACK<CRC><cr> if device accepted, or respond (NAK<CRC><cr>
nnn:5~300, the unit is minute.

3.17 PBEQOT<nnn><cr>: Set the time of battery equalized timeout.

Computer:PBEQOT<nnn><CRC><cr>
Device: (ACK<CRC><cr> if device accepted, or respond (NAK<CRC><cr>
nnn:5~360, the unit is minute.

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

Computer: PF<CRC><cr>
Device: (ACK<CRC><cr> if device accepted, or respond (NAK<CRC><cr>
All Device parameters set to default value.

Item	Default
Battery type	0 - AGM
Battery voltage	00 - Auto sensing
Max charging current	060 - 60A
BTS temperature compensation	00.0 - 0mV
Remote battery voltage detect	00 - Disable
Absorption voltage	14.10V
Floating voltage	13.50V
Battery equalized enable/disable	disable
Battery equalized time	60minutes
Interval time of battery equalization	30Days
The max current of battery	15A

equalization.	
Battery equalized voltage per unit	14.60V
Battery C.V. charge time	150minutes

4 Appendix

4.1 CRC calibration method

CRC.c