BWITT POWER 110V/220V RECTIFIER MODULE COMMUNICATION PROTOCOL

1 OVER VEIW

This 《BWITT Rectifier Module Communication Protocol》(hereinafter referred to as the "Agreement") describes the protocol of the 110V/220V power supply series rectifier module (hereinafter referred to as the rectifier module) Communication with a monitoring unit.

2 CONTENT

《Protocol》include functions as below:

The monitoring unit controls the rectifier module to delivery specified tasks, such as obtaining the software version, the alarm data, the switch quantity data and so on.

The communication process is performed in a half-duplex, variable-length, one-way response confirmation mode, and the monitoring unit sends a command to the rectifier module. Each issued command acts as a two-way communication process. If the rectifier module does not receive data for 1 minute, it is considered that the communication is faulty.

3 SPECIAL ITEM STATMENT

Upper computer: An intelligent device that manages the rectifier module and represents the master node in the master-slave protocol.

Rectifier module: A power rectifier module device that represents a slave node in a master-slave protocol.

RS485: A 2-wire serial communication standard that supports half-duplex serial short-range communication.

Forward command：The communication format which is sent to the module monitoring by the upper computer to make the module monitoring complete the specified task

Inquiry command: The communication format that the upper computer sends to the module monitor so that the module monitor returns the first information in the report queue

Response queue: The rectifier module monitors the information queue sent to the upper computer, and reports the information to the upper computer in the first-in-first-out mode when receiving the query command. Each query command corresponds to one report information and reports the current state

Board statement information：After the rectifier module monitors the power on or reset, this report information is generated first and then reported to the upper computer when the query command is issued

4 PHYSICAL INTERFACE

4.1 SERIAL COMMUNICATION INTERFACE ELECTRICAL STANDARD

The monitoring unit and the rectifier module communicate in RS485 half-duplex

4.2 INFORMATION TRANSMISSION

With Asynchronous mode, 1 start bit, 8 data bits, 1 stop bit, no parity bit.

4.3 DATA TRANSMISSION RATE

4800BPS

4.4 DATA ENCODING

Except for the frame header, the end of the frame, and the command using hexadecimal, the other is compressed BCD.

4.5 FRAME FORMAT

No.	1	2	3	4	5	6	7
Bytes	1	1	1	1	LENGTH -1	1	1
Format	SOI	ADDR	LENGTH	CID	INFO	CHKSUM	EOI

4.6 FORMAT EXPLAIN

No	SYMBOL	MEANINGS	REMARKS
1	SOI	Start Bit mark	0x7E
2	ADDR	Device Address Description	
3	LENGTH	CID + INFO length	
4	CID	Orders	
5	INFO	information	
6	CHKSUM	Check code	
7	EOI	End code	0x0D

Note: CHKSUM = ADDR+ LENGTH+ CID+ INFO , then into BCD; the address code of broadcast frame is 0*99, broadcast frame only work on startup, shutdown and pressure regulating. (The address code 0x99 in issuing the command actually represents the 99 module, and it is 0x63 in DSP)

5 COMMUNICATION MODE

The monitor unit and the rectifier module are master-slave mapping, the monitor unit is the master node, and the rectifier module is the slave node.After receiving the frame header, the rectifying module will judge whether the following address data is the local address. If yes, continue to receive the full frame, and then judge the check code; if not, determine the type of command, then respond.

6 INFORMATION TYPE

The communication command code of the rectifier module and the monitor unit as below

(remark: don't support the red command)

ISSUE COMMAND CODE	INPLICATION	UPLOAD COMMAND CODE	IMPLICATION
THE RECTIFIER MODULE			
0x03	Output voltage, current, early warning of rectifier module	0x83	Output voltage, current, early warning of rectifier module
0x04	Startup and shutdown	0x84	Startup and shutdown
0x06	Setting output voltage and current of rectifier module	0x86	Setting output voltage and current of rectifier module
0x07	Manufacturer information of rectifier module	0x87	Manufacturer information of rectifier module

7 DATA FORMAT

In issue command, the information field provides the specific parameters of the command execution. In response commands, the information field contains the specific data to be reported. See appendix A

7.1 output voltage, current, early warning of rectifier module

a.message

frame header	0x7e
address	xx
message length	0x01
CMD	0x03
check word	the sum of addresses, lengths, and commands
frame tail	0x0d

b.message respond

frame header	0x7e
address	xx
message length	0x12
CMD	0x83
INFO	Respond result(1 byte, “0”is good running)
	module output voltage(2 byte)
	module output current(2 byte)
	0(2 byte)
	0(2byte)
	early warning(1 byte)
	module protection type(1 byte)
check word	the sum of addresses, lengths, message fields and commands
frame tail	0x0d

Every analog in message fields is 2 byte,See appendix A

early warning date explain：

.7 :
.6 : module protection（0—normal，1—warning)
.5 : AC fault（0—normal，1—warning)
.4 : module fan fault（0—normal，1—warning)
.3 :
.2 : modular switch（0—startup，1—shutoff)

.1 : module fault（0—normal，1—warning)
.0 : current limit sign（0—normal，1—warning)

Module protection type：01—short-out，02—over-temperature protection，03—overvoltage protection

For example, upper computer send：7e 01 01 03 05 0d

Module respond: 7E 01 12 83 00 12 00 00 00 05 00 00 00 00 00 73 0D

7.2 STARTUP AND SHUTDOWN

a.message

frame header	0x7e
address	xx
message length	0x03
CMD	0x04
INFO	statement(1 byte；0—startup；1—shutdown)
	0
check word	the sum of addresses, lengths, message fields and commands
frame tail	0x0d

b. message respond

frame header	0x7e
address	xx
message length	0x02
CMD	0x84
INFO	statement of power module(1byte，01H-shutdown；00H-startup)
check word	the sum of addresses, lengths, message fields and commands
frame tail	0x0d

For example(shutdown)

send：7E 01 03 04 01 00 09 0D

Module respond:7E 01 02 84 01 36 0D

For example(startup)

send：7E 01 03 04 00 00 08 0D

Module respond：7E 01 02 84 00 35 0D

Broadcast example：

Shutdown

send：7E 99 03 04 01 00 61 0D

Module respond：No respond

Startup：

send：7E 99 03 04 00 00 60 0D

Module respond：No respond

7.3 SETTING OUTPUT VOLTAGE AND CURRENT

a.message

frame header	0x7e
address	xx
Message length	0x05
CMD	0x06
INFO	module output voltage(2 byte)
	module output current(2 byte, 0.5~20.0A)
check word	the sum of addresses, lengths, message fields and commands
frame tail	0x0d

Remark: the voltage multiple relationship is 1, the current multiple relationship is 100, set 20A, and the power transmission data is 20.00

b.message respond

frame header	0x7e
address	xx
message length	0x06
CMD	0x86
INFO	Respond result(1byte，“0”is good running)

	module output voltage(2byte)
	module output current(2byte)
check word	the sum of addresses, lengths, message fields and commands
frame tail	0x0d

For example：

Set 120V，20A limited current

Send：7E 01 05 06 12 00 20 00 62 0D

Module respond：7E 01 06 86 00 12 00 00 00 59 0D

Broadcast example：

Set 110V，20A limited current

Send：7e 99 05 06 12 00 20 00 14 0D

Module respond：No respond

7.4 PARAMETER OF VOLTAGE AND CURRENT

a.message

frame header	0x7e
address	xx
Message length	0x01
CMD	0x07
check word	the sum of addresses, lengths, message fields and commands
frame tail	0x0d

b.message respond

frame header	0x7e
upload address	1 byte
Message length	0x06
CMD	0x87
INFO	Respond result(1byte，“0”is good running)
	module output voltage（2 byte)

	module output current （2 byte)
check word	the sum of addresses, lengths, message fields and commands
frame tail	0x0d

For example：

Send：7e 01 01 07 09 0d

Module respond：7E 01 06 87 00 12 00 21 00 93 0D

APPENDIX A

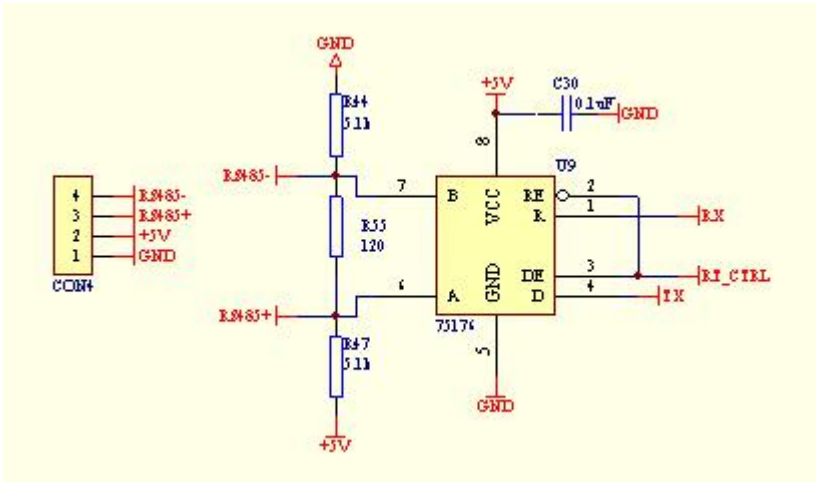
Every analog in message fields use 2 byte as expression：

The analog quantity multiplied by 100 transmits data as the information domain, with the high byte before the low byte.For example, if the current voltage of the system is 53.55v, the transmitted data is 5355, and the actual transmitted byte is 0x53 and 0x55.

After receiving the monitoring module, divide it by 100 to get the actual simulated data.

APPENDIX B

RS485 CIRCUIT DIAGRAM



1.CON4 is a interface of upper computer and module， GND、+5V support the power supply of Rectifier module monitors communication, RS485+、RS485-Is the differential signal of communication.

2.GND,+5V support the power supply of upper computer RS485 communication, TX、RX respond to sending and receiving port of upper computer's serial communication TTL.

3.RT_CTRL is the enable control signal received and sent by the upper computer to control RS485.