

Goldshell-HS1 Serial communication protocol

V0.3

REVISION HISTROY

Version	Date	Description
V0.1	2020.6.12	Preliminary Version.
V0.2	2020.6.22	Add process description.
V0.3	2020.7.2	Added warning sign for fan power.

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1 Overview

This paper mainly introduces the communication protocol between Goldshell' small blockchain terminal equipment and PC and other upper computer terminals.

2 Goldshell-HS1 Protocol

2.1 Communication Protocol Introduction

0xA53C96	PKT...	0x69C35A
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A complete communication consists of the start verification section 0xA53C96, the transmission packet PKT, and the end section 0x69C35A. PKT includes many types, such as sending JOB packets, reading Nonce packets, etc. PKT consists of headers and data content.

2.1.1 Query device information[TX]

Field name	describe	Start (byte)	length (byte)	value
Type	Packet type	0	1	0xA4
Version	Protocol version	1	1	0x10
Length	Packet length	2	4	

2.1.2 Send Job data[TX]

Field name	describe	Start (byte)	length (byte)	value
Type	Packet type	0	1	0xA1
Version	Protocol version	1	1	0x10
Length	Packet length	2	4	
Target	JOB target value	6	8	0x0000ffffffffffff
StartNonce	Calculate start value	14	8	0x00000000
EndNonce	Calculate end value	22	8	0xffffffffffff
JobNum	Job number	30	1	1-255

JobID	This JOB ID number	31	1	1-15
JobData	This JOB data	32	128	

2.1.3 Set device parameters[TX]

Field name	describe	Start (byte)	length (byte)	value
Type	Packet type	0	1	0xA2
Version	Protocol version	1	1	0x10
Length	Packet length	2	4	
Flag	Set parameters or query device status	6	1	0xA2:Device parameters 0x52:Check status
Voltage	Set working voltage mV	7	2	
Freq	Set working frequency	9	2	
Mode	Extended Algorithm Mode	11	4	
Temp	Target operating temperature	15	1	65

2.1.4 Receive nouce[RX]

Field name	describe	Start (byte)	length (byte)	value
Type	Packet type	0	1	0x51
Version	Protocol version	1	1	0x10
Length	Packet length	2	4	
JobID	JobID corresponding to Nonce	6	1	1-15
ChipID	ChipID corresponding to Nonce	7	1	1-255
CoreID	CoreID corresponding to Nonce	8	1	
Nonce		9	8	0xffffffff
HashExist	Whether to return the hash value	17	1	1-255
Hash	Hash value	18	32	Hashvalue

2.1.5 Receiver status[RX]

Field name	describe	Start (byte)	length (byte)	value
Type	Packet type	0	1	0x52
Version	Protocol version	1	1	0x10
Length	Packet length	2	4	
Chips	Number of chips	6	1	
Cores	Number of chip cores	7	1	9
Goodcores	Number of good cores	8	1	9
scanbits	How many bits are in the scan range	9	1	32
scantime	Scan full space time (100ms)	10	2	
Voltage	Current working voltage(mv)	12	2	
Freq	Current working frequency(MHz)	14	2	
Mode	Current work expansion algorithm mode	16	4	
Temp	Equipment temperature (°C)	20	1	
Rebootcnt	Chip restart times	21	1	
Tempwarn	Temperature warning sign	22	1	
Fanwarn	Fan warning sign	23	1	
Powerwarn	Power warning sign	24	1	
Rpm	Speed of the fan	25	2	

2.1.6 Receive device information[RX]

Field name	describe	Start (byte)	length (byte)	value
Type	Packet type	0	1	0x54
Version	Protocol version	1	1	0x10
Length	Packet length	2	4	
ModelName Length	ModelName effective length	6	1	10
ModelName	ModelName	7	16	Goldshell-HS1
FWV Length	Firmware version length	23	1	5
FirmwareVersion	Current firmware version	24	8	1.0.1
SN	Bar code	33	32	Byte[0]: Effective length Byte[1:31]: X1208EDCA5561

HashRate Info	HashRate information	65	32	Byte[0]: Effective length Byte[1:31]: information
Workdepth	Work depth	97	1	

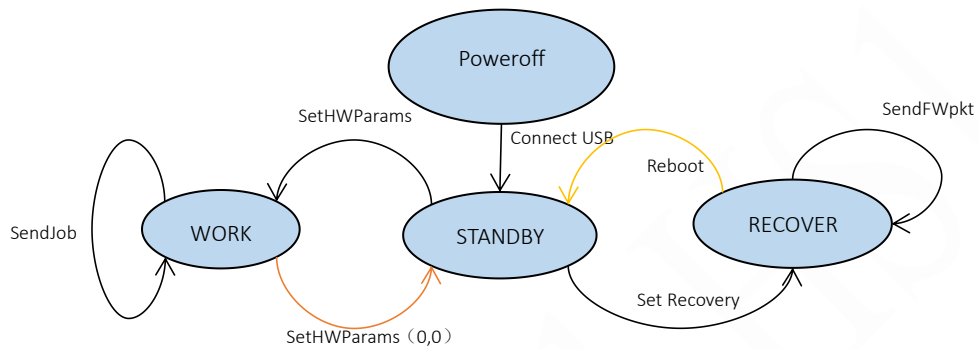
2.1.7 Respond to the Job result command sent[RX]

Field name	describe	Start (byte)	length (byte)	value
Type	Packet type	0	1	0x55
Version	Protocol version	1	1	0x10
Length	Packet length	2	4	

3 Introduction of software scheme

3.1 Finite State Machine

3.1.1 Goldshell-HS1 State transition



3.1.2 LED Indicator definition

status	Led status description	Remarks
STANDBY	Flash (on)	
WORK	Flash (on 300ms, off 100ms)	
RECOVERY	Flash (on 300ms, off 100ms)	
EXCEPTION	Flash (on 100ms, off 1s)	

4 Typical workflow

4.1 Specific workflow

1. Send query device information packet (A4), wait for receiving device information packet (54), check whether the USB channel is connected

send:

A53C96A4100600000069C35A

receive:[illegible]

2.Send setting device parameter packet (A2), wait for receiving device status packet (52)

send:

A53C96A2101000000A2EE026400040000005069C35A

receive:

A53C9652101700000002280020FFFFEE02640004000000000000069C35A

When the Flag field of the device parameter packet is A2, it means the device parameter is set. At this time, it is necessary to set the device voltage and frequency to a non-zero value.

The device will run. When it is 52, it is to query the device parameters. At this time, the current device status package is returned. When the voltage and frequency are set to 0, the device will stop working and return to the standby state.

3. Send JOB data packet (A1), waiting to receive response packet (55)

send:

A53C96A1109C0000006F0000000000000000000000FFFFFFFF
FF010C000000000000000000000000962B1C413636E85858FDf91D15
2B42056662B7FC000000000000005B20195AFE280A27276D4517C7F8
0F5A61843EAC78B1AF2C82962B1C413636E80378E4A3E33D2165220B
27A03B7F0EB30BB515B160961657AF5B9F8AF4996C2566621ECD0F71
C6A77CF80C2E6B6E816AAE44D07D91830CAA0769C35A

receive:

A53C9655100A0000000000000069C35A

The total number of JOB packets sent is the first step to query the number of workdepth in the device information, and then sent in sequence. When the response packet is received, the next JOB packet is sent until it is finished. It is not possible to send multiple JOB packages at the same time before receiving the corresponding packages. When setting startnonce, the upper 32 bits are the ntime value, and the JOB scan period is the scantime in the device parameter value. When the scantime arrives, the new work is updated to avoid double calculation. JOBID is 0-15, assuming a work depth of 4, the JOBID of 4 consecutive JOBS is updated in sequence with 4 different consecutive IDs for each group. For example, this time JOBID is 0, 1, 2, 3, next time is 4, 5, 6, 7 When it reaches 15, the next ID starts from 0, and the ID number can be used to determine which current JOB produced the nonce received.

4. Polling to receive NONCE packets(51)

A53C965110120000000C0103B7F2920200000000069C35A