

Judicial Correction Bracelet Interface Protocol



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1 .data transmission

Data is transferred serially asynchronously. The first bit is the start bit, followed by the data bits. Data follows the least significant bit first rule. data body isASCIICharacter transmission, the parameters used are as follows:

Baud rate: 4 8 0 0 ~ 1 1 5 2 0 0 bps, can be set as required, the default value is 1 1 5 2 0 0

bps; start bit: 1 bit;

Data bits: 8 bit;

stop bit: 1 bit;

Check: None.

2 .Public network link communication data format

2 .1General Statement Format

Generic statements are designed for general use. A generic statement contains the following elements (in order of appearance):

<\$HX>,<command code>,<IDlogo>,<frame body>,<#>,<check code>,<CR><LF> 1)

sync header:

length: 3 characters

Characters: \$HX

2)command code

Length: 4 characters

命令码	数据类型
0xxx	终端上行数据
1xxx	平台下行命令

3) IDlogo

length: 15 characters (terminalIMEINumber)

example: 3 8 6 9 3 1 3 5 1 2 3 4 5 6 7 8 (0 x33, 0 x38, 0 x36, 0 x39, 0 x33, 0 x31, 0 x33, 0 x35, 0 x31, 0 x32, 0 x33, 0 x34, 0 x35, 0 x36, 0 x37, 0 x38)

4)frame body

"For details, please refer to the upstream and downstream frame body commands"

5)terminator

length: 1 characters

character: #

6)check code

length: 2 characters

Character: checksum, XOR all characters from "\$" to "#" to get 1 byte hexadecimal number, starting with 2 individual ASCII output in character form.

7)carriage return line feed

length: 2 characters

bytes: <CR><LF> (0x0D,0x0A)

character: \$HX

2.2 Terminal uplink data frame

General statements and valid upstream and downstream statements are valid statements, and statements of any other form are not valid and must not be transmitted on the bus.

Terminal uplink data (command code: 0 xxx)		
command code	frame body	Remark
0 0 0 1	<p>Terminal request command frame body:</p> <p><random number>,<IMSI>,<phone_num>,<i>,<f>,<authentication code></p> <p>Length: N characters</p> <p>Random number: 4 characters</p> <p>IMSI: SIM card unique ID number</p> <p>Phone_num: The local phone number of the positioning terminal</p> <p>i: default is 0</p> <p>f: default is 0</p> <p>Authentication code: # characters</p> <p>answer:</p> <p><random number>,<OK(/ER)> Terminal registration success/failure</p>	<p>Terminal goes online</p> <p>Authentication information</p>
0 0 0 2	<p><heartbeat packet>: HRT</p> <p>Length: 3 characters</p>	<p>heartbeat packet</p> <p>terminal login</p> <p>information</p>
0 0 0 4	<p>Format: <TIME></p> <p>Length: 4 characters</p>	<p>initial service</p> <p>device time</p>
0 0 0 5	<p>Format: <positioning method>, <date>, <time>, [<RMC data>, <base station LBS>, <shift</p> <p>Mobile base station ID>, <WIFI hotspot>], <alarm></p> <p>1 . Positioning method: N</p> <p>N:=A mixed mode positioning:</p> <p>That is, all four positioning modes are reported at the same time;</p> <p>=S Satellite Positioning:</p> <p>Only satellite positioning RMC data is reported;</p> <p>=L mobile baseLBSposition:</p> <p>Mobile base station onlyLBSlatitude and longitude data;</p> <p>=Mmobile base stationID:</p> <p>Only provide public network base station information data;</p> <p>=WWIFIFHotspot location:</p> <p>only availableWIFIFHotspot address data;</p>	<p>mobile terminal</p> <p>positioning data</p> <p>information</p>

	<p>2 . Date:</p> <p>ddmmyy date yy = year; mm = month; dd = day;</p> <p>3 . Time:</p> <p>hhmmss Beijing time: hh=hour; m=minute; ss=second;</p> <p>4 . RMC: <Refer to RMC format definition></p> <p>5 .base stationLBS:</p> <p><Refer to smartphone Google or Baidu interface definition></p> <p>6 .mobile base stationID:mnc1/lac1/cell1/hex1</p> <p>mnc1: mobile base station = 0 Unicom Base Station = 1</p> <p>lac1: cell number</p> <p>cell1: base station number</p> <p>hex1: base type, 1 6 or 1 0</p> <p><small>Note: If the terminal obtains the parameter information of multiple base stations, the base stations will be added according to the format order.IDcan be, for example</small></p> <p>For example: "mnc1/lac1/cell1/hex1/mnc2/lac2/cell2/hex2/mnc3/lac3/cell3/hex3"</p> <p>7 . WIFI hotspot: mac1/rsi1/mac2/rsi2/...</p> <p>mac1: 1 # WIFIHotspot address</p> <p>rsi1: 1 # WIFIHot spot signal field strength</p> <p>mac2: 2 # WIFIHotspot address</p> <p>rsi2: 2 # WIFIHot spot signal field strength</p> <p>...< most reported 6 individualWIFIHotspot data></p> <p>8 . Alarm: <Refer to the following table for alarm data description></p>	
0 0 0 7	<p>Format: <base station LBS>, <WIFI hotspot></p> <p>Reply: <See the next command "1007"></p>	<p>initial positioning</p> <p>ask</p>

Alarm data		
Format: <An><An> <An> n=0,1,2...		
logo	illustrate	Remark
A11	Disassembly alarm	1 . For example, if there is a disassembly alarm and a low battery alarm, the alarm data bit is "ATA9"; 2 . If there is no alarm, it is empty, and the alarm separator ", " in the frame body is reserved;
A8	shutdown alarm	
A14	Watch low battery warning	

2.3Valid down commands

General statements and valid upstream and downstream statements are valid statements, and statements of any other form are not valid and must not be transmitted on the bus.

Platform downlink command (command code: 1 xxx)		
command code	frame body	Remark
1 0 0 1	Downstream command: < LOCATION/mode > Length: 1 0 characters LOCATION: single location request mode: positioning method =0, automatic (default Beidou positioning priority) =A, mixed =S, Beidou =L, LBS positioning =M, mobile base station =W, WIFI positioning	single location tracking request
1 0 0 2	Downstream command: < times > Length: n characters 1 . times=0 : disable timed uploading 2 . times=1~99999 : The timing upload time is (times)*1 second Terminal answer: <times>/<OK(/ER)> Length: N characters	Scheduled upload time
1 0 0 4	Downstream command: <TIME,time> Length: n characters 1 . TIME: character TIME output 2 . time: Time year, month, day, hour, minute, second, such as 1 7 0 4 1 8 0 9 0 8 5 6	server time request make answer

1 0 0 6	<p>Next command: <nums/pnu1/pnu2.../password></p> <p>Length: N characters</p> <p>nums: set the number of mobile phones, the maximum is 6 ;</p> <p>pnu1: mobile number 1 (eg 1 3 0 0 2 9 8 5 7 0 9)</p> <p>pnu2: mobile number 2 (eg 1 3 0 0 2 9 8 5 7 0 9)</p> <p>...</p> <p>password: password (default: 0 0 0 0 0 0)</p> <p>Terminal answer: <nums/pnu1/pnu2.../password>/<OK(/ER)></p> <p>Length: N characters</p>	<p>Manage phone settings</p> <p>/</p> <p>Restricted number settings</p>
1 0 0 7	<p>The following command:</p> <p><ddmmyy/hhmmss/ddmm.xxxx/a1/dddmm.xxxx/a2></p> <p>Length: n characters</p> <p>3 . ddmmyy : day, month, year (UTC)</p> <p>4 . hhmmss : hours, minutes, seconds (UTC)</p> <p>5 . ddmm.xxxx : Latitude, dd = degrees; mm = minutes; xxxx = fractional part of minutes</p> <p>6 . a1 : N-south latitude; S-north latitude</p> <p>7 . dddmm.xxxx : longitude, ddd = degrees; mm = minutes; xxxx = fractional part of minutes</p> <p>Minute</p> <p>8 . a2 : W - west longitude; E - east longitude</p>	<p>initial location and time</p> <p>Answer the setup command</p>
1 0 0 9	<p>Downstream command: < VER ></p> <p>Length: 3 characters</p> <p>Terminal answers:</p> <p>< hver/sver/IMSI/IMEI/phone_num/i/f ></p> <p>Length: n characters</p> <p>hver: terminal hardware version number, for example: H1.00.01</p> <p>sver: terminal software version number, for example: S1.00.02</p> <p>IMSI: SIM card unique ID number</p> <p>IMEI: The unique ID number of the positioning terminal</p> <p>Phone_num: The local phone number of the positioning terminal</p> <p>i: default is 0</p> <p>f: default is 0</p>	<p>read terminal parameters</p>
1 0 1 0	<p>Downstream command: < Alm_type / Alm_options ></p> <p>Length: 3 characters</p> <p>Alm_type: Alarm type</p> <p>=0: Fence out-of-bounds alarm</p>	<p>Setting reminders for watch alarms</p> <p>way of displaying information</p>

	<p>Alm_options: alarm prompt mode</p> <p>=0 : disable alarm prompt</p> <p>=1 : screen display</p> <p>=2 : the bracelet vibrates</p> <p>=3 : the indicator light flashes</p> <p>=4 : sound prompt</p> <p>=5 : All the above alarm prompts are enabled</p> <p>Terminal answer: <Alm_options>/<OK(/ER)></p> <p>Length: n characters</p>	
1 0 1 1	<p>Downstream command: < Sms_data ></p> <p>Sms_data: little endian unicode code</p> <p>For example: Sms_data =<1a 9 0 e5 7 7 1 a ff 3 2 0 0 3 0 0 0 3 1 0 0 3 7 0 0 7 4 5 e 3 2 0 0 0 8 6 7 3 7 0 0 e5 6 5 a1 5 2 c5 5 f 4 d 5 2 8 0 5 f 5 5 9 6 7 f 8 9 0 1 7 7 f8 5 3 d5 6 c 8 5 5 3 7 e 7 b 3 0 5 2 0 c ff 2 2 8 c 2 2 8 c 0 1 ff></p> <p>The watch converts Chinese characters to display = "Notice: Be sure to go to Shaanxi on February 7 , 2 0 1 7</p> <p>Provincial Department of Justice signed, thank you! "</p>	Send SMS notification
1 0 1 2	<p>Downstream command: < PARAMETER ></p> <p>Length: 9 characters</p> <p>Terminal answers:</p> <p><hver/sver/imsi/imei/phone_num/voltage/csq/wifi/bluetooth/bd></p> <p>Length: n characters</p> <p>hver: terminal hardware version number, for example: H1.00.01</p> <p>sver: terminal software version number, for example: S1.00.02</p> <p>imsi: SIM card unique ID number</p> <p>imei: unique ID number of the positioning terminal</p> <p>phone_num: the local phone number of the positioning terminal</p> <p>voltage: battery voltage (unit: volts)</p> <p>csq: signal quality</p> <p>wifi: Whether the WIFI function is enabled (Y/N)</p> <p>bluetooth: Whether the bluetooth function is enabled (Y/N)</p> <p>bd: Whether the Beidou/GPS satellite positioning function is enabled (Y/N)</p>	Status parameter online diagnosis

3 .data content

3 .1character definition

reserved characters see table 1 , see table for data type 2 , transmitter identification mnemonics see table 3 , common statement identifiers see table 4 .

surface 1 reserved characters

	hex	decimal	
<CR>	0 D	1 3	carriage return - end of statement delimiter
<LF>	0 A	1 0	newline
#	twenty three	3 5	
\$	twenty four	3 6	parameter statement delimiter begins
*	2 A	4 2	sum check field delimiter
,	2 C	4 4	field delimiter
\	5 C	9 2	reserved
	5 E	9 4	encoding delimiter in hexadecimal
~	7 E	1 2 6	reserved
	7 F	1 2 7	reserved

surface 2 Data Type Description

type of data	symbol	definition
number	XX	Variable-length numeric fields: The integer and fractional parts of the field are variable in length, the decimal point and The fractional part is optional. Variable-length numeric fields can be used to represent integers. (E.g 7 1 .1=0071.1=71.100=00071.1000=71)
Fixed length numbers	XX...X	Fixed-length numeric field: A numeric field with a fixed length, the length of which is equal to the number of x. if number If the value is negative, the first character of the field is the symbol "-" (HEX2D) , the field length is based on the original length Add 1 ; if the value is positive, the sign is omitted and the field length remains unchanged.
variable length characters	C--C	Variable-Length Character Field: A variable-length character field.
fixed-length characters	aa...a	Fixed-length character field: a character field with a fixed length, the field length is equal to the number of a, the character area Uppercase and lowercase.
latitude	llll.ll	Fixed/variable length field: The data length to the left of the decimal point is fixed at 4 digits, of which 2 digits represent "degree", the last 2 digits represent "minute". The number of digits after the decimal point is variable, and the unit is "minute". When latitude "degrees" or When the number of "minutes" data is insufficient, zeros are added in front; when the latitude value is an integer, the decimal point and the decimal part can be Omit.
longitude	yyyyy.yy	Fixed/variable length field: The data length to the left of the decimal point is fixed to 5 . The first 3 digits represent "degree", the last 2 digits represent "minute". The length of the part after the decimal point is variable, and the unit is "min". When longitude "degrees" or When the number of "minutes" data is insufficient, zeros are added in front; when the longitude value is an integer, the decimal point and the decimal part can be Omit.
time	hhmmss	Fixed/variable length field: The data length to the left of the decimal point is fixed to 6 digits. The first 2 digits represent "Hour", the middle 2 digits represent "minute", and the last 2 digits represent "second". The unit after the decimal point is "seconds", the length variable. When the number of data digits in the hour/minute/second part is insufficient, zeros are added in front; when the time is a whole second, the decimal part can be omitted.
state	A/V	Fixed length fields: A - positive, present, correct, etc. V - negation, non-existence, error, etc.

3 .2 RMC

Function description: output statement. Recommended for minimal navigation to transfer data.

example:A/ 1 1 4 3 5 3 /6016.3245/N/ 0 2 4 5 8 .3270/E/ 0 .01/0.00/121009

RMCFormat:

A/hhmmss/ddmm.xxxx/a/dddmm.xxxx/a/xx/xx/ddmmyy

field	type	Detailed Description
1	A	Data Status: A=valid; V=invalid
2	hhmmss	UTC time of fix: hh – hours; mm – minutes; ss – seconds
3	ddmm.xxxx	Latitude: dd = degrees; mm = minutes; xxxx = fractional part of minutes
4	a	N/S: N – South Latitude; S – North Latitude
5	dddmm.xxxx	Longitude ddd = degrees; mm = minutes; xxxx = fractional part of a minute
6	a	W/E: W – west longitude; E – east longitude
7	xx	ground speed Unit: Section (N)
8	xx	Ground heading, referenced to true north, clockwise to heading angle Unit: degree
9	ddmmyy	date dd = day; mm = month; yy = year

4 .Short message configuration server address

✓ Downstream command: **\$HX,SSER,E,ip,ports,C<,password>**

■ **ip:serverIP,E.g: 2 2 2 .41.213.156**

■ **ports: server port number, for example: 1 0 0 1 0**

■ **password: ASCII characters of the last six digits of the IMEI number, for example: there is a terminal**

The IMEI number is: 3 5 8 5 2 0 0 4 1 0 1 4 5 6 9 , and the password is 0 1 4 5 6 9 .

✓ **Answer: \$HX,SSER,OK(/ERR),E,ip,ports,C,IMEI**

Note: In the SMS data sent by the platform, the first [...] (The content in square brackets is the text message

business information, ignore it) part is not the SMS setting command, the \$ after the square bracketsHXThe data for the frame

header is the SMS setting command that needs to be parsed by the terminal,IMEIterminalIMEINumber.

5 .Short message configuration terminal local number

✓ Downstream command: **\$HX,PN,phone_num<,password>**

■ **phone_num: Terminal number, for example: 1 3 5 xxxxxxxx**

■ **password:forIMEIthe last six digits of the numberASCIIcharacter, eg: there is a terminalIMEIThe**

number is: 3 5 8 5 2 0 0 4 1 0 1 4 5 6 9 , the password is 0 1 4 5 6 9 .

✓ **Answer: \$HX,PN,phone_num,OK(/ERR)**

6 .Short message restart (reserved)

✓ Downstream command: **\$HX,RESET<,password>**

■ **password:forIMEIthe last six digits of the numberASCIIcharacter;**

✓ **Answer: \$HX,RESET,OK(/ERR)**

7 .Remarks "Authentication Instructions"

1) Terminal authentication and authentication, we define that each time the terminal reconnects to the platform server, an authentication process is generated, that is, each hardware ID parameter inside the terminal is reported, and according to some ID parameters, it is generated based on the agreed key. An authentication code is used to package and report the data. After the server receives the data, it performs verification in the same way. If the authentication code matches, the reply is successful, and the terminal performs the reporting task normally;

2) The calculation method of the authentication code is as follows:

a) Take the last 8 digits of the IMEI code, which is tentatively expressed as A1 (that is, obtain an 8 -digit decimal number); b) Take the last 8 digits of the IMSI code, tentatively expressed as A2 (ie, obtain an 8 -digit decimal number));

c) The terminal randomly generates 2 -byte random numbers;

d) Define B as integer 4 -byte data (int), calculate $B=(A1+A2+\text{random number})$;

e) The agreed key is a 4 -byte code chip, the default is 0xABCD1234;

f) Define the authentication code as integer 4 -byte data, calculate: authentication code = (B) XOR (key)

g) Define the authentication code as integer 4 -byte data, calculate: authentication code=(B) XOR (key);

h) When reporting data, it is necessary to convert the 2 -byte random number into 4 ASCII characters, and the 4 -byte authentication code into 8 ASCII characters;

3) For example:

a) $A1=12345678$ (12345678 in hexadecimal is 0xBC614E)

b) $A2=87654321$ (87654321 is 0x5397FB1 in hex)

c) random number=0x1234 (0x1234 is 4 6 6 0 in decimal)

d) $B = 0xBC614E + 0x5397FB1 + 0x1234 = 0x05F5F333$

e) $key = 0xABCD1234$

f) Calculate Authentication Code = $(0x05F5F333) \text{ XOR } (0xABCD1234) = 0xAE38E107$

g) When reporting data, random number - fill in 4 characters of 1 2 3 4, and authentication code - fill in 8 characters of AE38E107;