Share Bike Smart Lock(Hardware)
Air interface Protocol

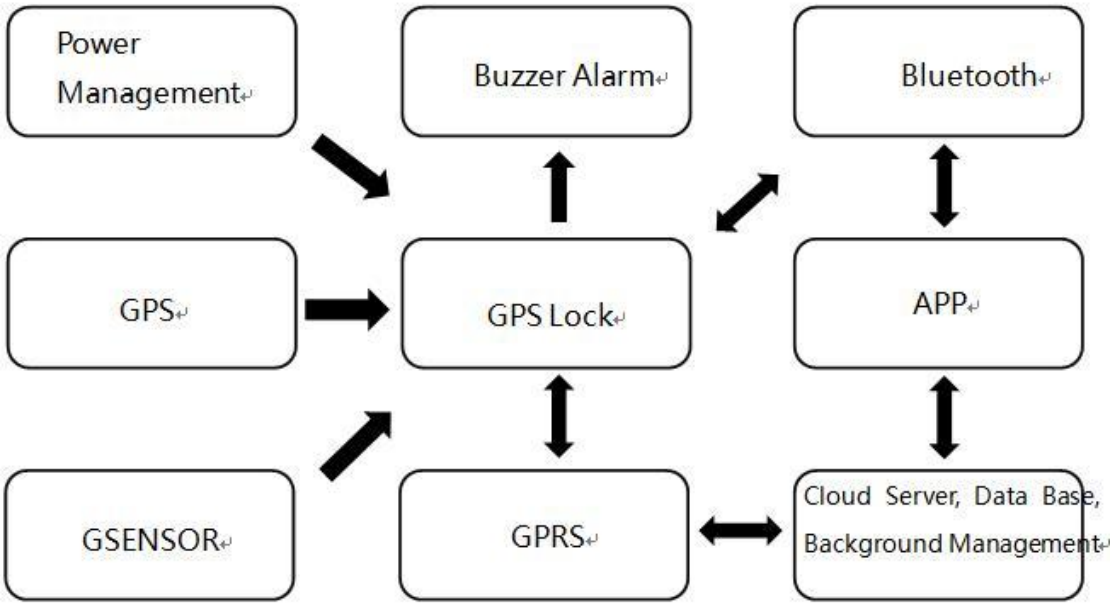
(Basic Instructions)

V:02.04

Functions Framework:

Includes the Server, Mobile APP, and the GPS Bike Lock(Terminal).

System Frame:



Communication connecting:

- ASCII Command character, all command characters are capital letter.
- The communication protocol is TCP-SOCKET between Lock and Server.
- The Lock sends a TCP connecting requests to Server, after connecting succeed, sends a Sign-in Packet Command to Server(Q0), and then sends a command each 4 minutes (Heartbeat Packet Command(H0), or other commands), for maintaining the connection of TCP.
- Heartbeat Packet Command includes Lock's time(Default), current battery, etc.

B. Command Data Format:

1. **Device Type Identify Code(**2 byte, according to specific hardware version**):**
   **
2. **Server sends command to Terminal(Bike Lock)**

Reserved Bits (2 bytes HEX): 0xFF,0xFF

Command Header (5 bytes): *CMDS

Device Type Identification Code (2 bytes): XX

Product Serial Number (15 bytes): YYYYYYYYYYYYYYY

Server Time-Year/Month/Day/Hour/Min/Sec : YYMMDDHHMMSS

Command Code (2 bytes): CMDNUM

Command Value : datd1, data2.....

Command Ends Code: #

3. Lock sends/backtrack Command to Server

Command Header (5 bytes) : *CMDR

Device Type Identification Code (2 byte, according to specific hardware version) : **

Product Serial Number (15 bytes) : YYYYYYYYYYYYYYY

Local Time-Year/Month/Day/Hour/Min/Sec : YYMMDDHHMMSS

Command Code (2 bytes) : CMDNUM

Command Value : datd1,data2.....

Command Ends Code: # + Line breaks character: '\n'

4. Server receives a response from the Lock End after the instruction is executed

Reserved Bits (2 bytes HEX)： 0xFF,0xFF

Command Header (5 bytes) : *CMDR

Device Type Identification Code (2 byte, according to specific hardware version) : **

Product Serial Number (15 bytes) : YYYYYYYYYYYYYYY

Local Time-Year/Month/Day/Hour/Min/Sec : YYMMDDHHMMSS

Command Code (2 bytes) : Re

Command Value：cmd (Commend code received from lock response, Example: L0、 L1、 G0 etc.)

Command Ends Code: # + Line breaks character ’\n’

Example: (Reserved Bits ff(2 bytes HEX))：

0XFF,0XFF +*CMDS,XX,863158022988725,000000000000,Re,L0#

C. Communication Instructions(Foundations Instructions):

Remarks: Green part is basic function instruction of current GPS horseshoe lock , The command can be added as per customized function needs.

1. Device Sign-in Command/Instruction **Q0** (Device - > Server)
2. Heartbeat Packet **H0** (Device -> Server)
3. Locating Command **D0** (Device < - > Server)
4. Unlocking Command **L0** (Device < - > Server)
5. Locking report to Server Command **L1** (Device < - > Server) (below command is not available in current version)
6. Get Lock battery power, GPRS signal strength, lock status, alarm status command S5 (Device <->Server)
7. Buzzer finding bike prompt command S8 (Device <-> Server)
8. Firmware Version Query Command G0 (Device <-> Server)

D. Communications Command Illustration (Basic Instructions):

1. Sign-in Command Q0

Functions Illustration :for bicycle lock sign-in Server;

1.1 Server -> bicycle lock : non

1.2 bicycle lock -> Server:

*CMDR, XX, YYYYYYYYYYYYYYY,YYMMDDHHMMSS,Q0, batv#

Command Header：*CMDR

Device Type Identification Code (2 bytes)：XX

Device IMEI Number：YYYYYYYYYYYYYY

Local Time-Year/Month/Day/Hour/Min/Sec：YYMMDDHHMMSS

Command Code：Q0

Command value: batv represents the battery voltage of the lock (Example: 412 means 4.12V)

Example:

*CMDR, XX, 863158022988725,161201150000,Q0, 412#

2. Heartbeat Packet H0

Functions illustration: for maintaining the connection between bicycle lock and Server;

2.1. Server -> bicycle lock: none

2.2. bicycle lock -> Server:

*CMDR, XX, YYYYYYYYYYYYYYY,YYMMDDHHMMSS,H0,status,batv#

Command Header : *CMDR

Device Type Identification Code (2 bytes) : XX

Device IMEI Number : YYYYYYYYYYYYYYY

Local Time-Year/Month/Day/Hour/Min/Sec : YYMMDDHHMMSS

Command Code : H0

Command Value: status means the lock status value

Command value: batv represents the battery voltage of the lock (Example: 412 means 4.12V)

Example:

*CMDR,OM,863158022988725,161201150000,H0,0,412#

3. Locating Command D0 (For now, bicycle lock will upload position automatically in specified situation)

Functions illustration: for when alarm/locking processing, locating the bicycle position and upload to Server;

3.1 Server -> bicycle lock:

*CMDS,XX,YYYYYYYYYYYYYYY,YYMMDDHHMMSS,D0#

Reserved Bits : 0xFF,0xFF

Command Header : *CMDS

Device Type Identification Code (2 bytes) : XX

Device IMEI Number：YYYYYYYYYYYYYY

Server Time-Year/Month/Day/Hour/Min/Sec：YYMMDDHHMMSS

Command Code: D0

Command Value: none

Example: (Red part is reserved bits 2 Byte - ff(HEX))：

0XFF,0XFF + *CMDS,XX,863158022988725,000000000000,D0#

3.2 bicycle lock -> Server:

*CMDR,XX,YYYYYYYYYYYYYY,YYMMDDHHMMSS,D0, locationdata#

Command Header：*CMDR

Device Type Identification Code (2 bytes)：XX

Device IMEI Number：YYYYYYYYYYYYYY

Local Time-Year/Month/Day/Hour/Min/Sec：YYMMDDHHMMSS

Command Code：D0

Command Value： Locationdata is the responsed GPS data

Example:

*CMDR,XX,863158022988725,000000000000,D0,0,124458.00,A,2237.753
14,N,11408.62621,E,0.066,,151216,,,A#

3.3 GPS Data format analysis

*CMDR,XX,863158022988725,000000000000,D0,0,<1>,<2>,<3>,<4>,<5>,<6>,<7>,<8>,<9>,<
10>,<11>,<12>#

<1> UTC Time, hhmmss(HHMMSS) fomat

<2> Positioning status, A = active positioning, V = invalid positioning

<3> Latitude ddmm.mmmm (degrees) format (the front 0 will also be transmitted)

<4> Latitude hemisphere N (northern hemisphere) or S (southern hemisphere)

<5> Longitude dddmm.mmmm (degrees) format (the front 0 will also be transmitted)

<6> Longitude hemisphere E (longitude) or W (west)

<7> Ground rate (000.0 to 999.9, the front 0 will also be transmitted)

<8> Ground heading (000.0 ~ 359.9 degrees, with true North as the reference, the front 0 will also be transmitted)

<9> UTC date, ddmmyy (day / month) format

<10> magnetic declination (000.0 ~ 180.0 degrees, the front 0 will also be transmitted)

<11> Magnetic declination direction, E (east) or W (west)

<12> mode indication (A = autonomous positioning, D = differential, E = estimate, N = data is invalid)

4. Unlocking/locking Command **L0 (**The current horseshoe lock is only remotely unlocked without remote locking**)**

Functions illustration: for unlocking/locking;

4.1 Server -> bicycle:

*CMDS,XX,YYYYYYYYYYYYYY,YYMMDDHHMMSS,L0,onoff# Reserved Bits：0xFF,0xFF

Command Header：*CMDS

Device Type Identification Code (2 bytes)：XX

Device IMEI Number：YYYYYYYYYYYYYY

Server Time-Year/Month/Day/Hour/Min/Sec：YYMMDDHHMMSS

Command Value：

Onoff: unlock（0）/lock（1）

Terminal Command Execute illustration:

Terminal unlock/lock then after receiving the Command.

Example: (Red part is reserved bits 2 Byte - ff(HEX))：

0XFF,0XFF + *CMDS,XX,863158022988725,000000000000,L0,0#

4.2 bicycle lock-> Server：

*CMDR,XX,YYYYYYYYYYYYYY,YYMMDDHHMMSS,L0,onoff#

Command Header: *CMDR

Device Type Identification Code (2 bytes)： XX

Device IMEI Number: YYYYYYYYYYYYYY

Local Time-Year/Month/Day/Hour/Min/Sec :YYMMDDHHMMSS

Command Code: L0

Command Value: Onoff: unlock (0) /lock(1)

Terminal Command Execute illustration:

Terminal unlock/lock then after receiving the Command.(The bicycle lock is only for unlocking, lock by manual)

Example:

*CMDR,OM,863158022988725,161201150000,L0,0#

5. Bicycle locked information uploading L1

Functions illustration: for lock body reporting bicycle locked to Server;

1. Server -> bicycle lock: none

2. bicycle lock -> Server:

*CMDR,XX,YYYYYYYYYYYYYYY,YYMMDDHHMMSS,L1#

Command Header: *CMDR

Device Type Identification Code (2 bytes): XX

Device IMEI Number: YYYYYYYYYYYYYYY

Local Time-Year/Month/Day/Hour/Min/Sec: YYMMDDHHMMSS

Command Code: L1

Command Value: none

Example:

*CMDR,OM,863158022988725,161201150000,L1#

6. Get Terminal Lock Battery power, GPRS signal strength, lock status, alarm status command S5

Function instruction: Used for obtaining basic status info of the smart lock;

6.1 Server -> Bike lock :

*CMDS,XX,YYYYYYYYYYYYYYY,YYMMDDHHMMSS,S5#

Reserved Bits:0xFF,0xFF

Command Header:*CMDS

Device Type Identification Code (2 bytes):XX

Device IMEI Number:YYYYYYYYYYYYYYY

Server Time-Year/Month/Day/Hour/Min/Sec:YYMMDDHHMMSS

Command Code: S5

Command Value: none

Example: (Red part is reserved bits 2 Byte - ff(HEX)):

0XFF,0XFF + *CMDS,XX,863158022988725,000000000000,S5#

6.2 Bike lock -> Server:

*CMDR,XX,YYYYYYYYYYYYYYY,YYMMDDHHMMSS,D0,batv,csq,R,lock,warning#

Command Header:*CMDR

Device Type Identification Code (2 bytes):XX

Device IMEI Number：YYYYYYYYYYYYYY

Local Time-Year/Month/Day/Hour/Min/Sec：YYMMDDHHMMSS

Command Code：S5

Command value:

batv: represents the battery voltage value(344 ~ 420) of the lock (Example: 412 means 4.12V)

csq: represents the GPRS signal value of the lock(0 ~ 31)

R: Reserved parameter

lock: Current lock status(1 - Lock/ 0 - Unlock)

warning: The lock alarming info(Reserved parameters)

Example:

*CMDR,XX,863158022988725,000000000000,S5,412,31,00,1,0#

7. *Buzzer alarm look*ing for bike command S8

Function instruction: Used for obtaining basic status info of the smart lock;

7.1 Server -> Bike lock：

*CMDS,XX,YYYYYYYYYYYYYY,YYMMDDHHMMSS,S8,btime,recive#

Reserved Bits：0xFF,0xFF

Command Header：*CMDS

Device Type Identification Code (2 bytes)：XX

Device IMEI Number：YYYYYYYYYYYYYY

Server Time-Year/Month/Day/Hour/Min/Sec：YYMMDDHHMMSS

Command Code: S8

Command Value:

btime: The number of seconds the buzzer alarm rings

recive: Reserved parameters

Example: (Red part is reserved bits 2 Byte - ff(HEX))：

0XFF,0XFF + *CMDS,XX,863158022988725,000000000000,S8,5,0#

7.2 Bike lock -> Server：

*CMDR,XX,YYYYYYYYYYYYYY,YYMMDDHHMMSS,D0,batv,csq,R,lock,warning#

Command Header：*CMDR

Device Type Identification Code (2 bytes)：XX

Device IMEI Number：YYYYYYYYYYYYYY

Local Time-Year/Month/Day/Hour/Min/Sec：YYMMDDHHMMSS

Command Code：S8

Command value:
btime: The number of seconds the buzzer alarm rings
recive: Reserved parameters
Example:
*CMDR,XX,863158022988725,000000000000,S8,005,000#

8. Firmware Version Query Command G0

Function Instruction: Used for firmware version and Compile date inquire

8.1 Server -> Bike lock：

*CMDS,XX,YYYYYYYYYYYYYY,YYMMDDHHMMSS,G0#

Reserved Bits：0xFF,0xFF

Command Header：*CMDS

Device Type Identification Code (2 bytes)：XX

Device IMEI Number：YYYYYYYYYYYYYY

Server Time-Year/Month/Day/Hour/Min/Sec：YYMMDDHHMMSS

Command Code: G0

Command Value: none
Example: (Red part is reserved bits 2 Byte - ff(HEX))：
0XFF,0XFF + *CMDS,XX,863158022988725,000000000000,G0#

8.2 Bike lock -> Server：

*CMDR,XX,YYYYYYYYYYYYYY,YYMMDDHHMMSS,G0,ver,date#

Command Header：*CMDR

Device Type Identification Code (2 bytes)：XX

Device IMEI Number：YYYYYYYYYYYYYY

Local Time-Year/Month/Day/Hour/Min/Sec：YYMMDDHHMMSS

Command Code：G0

Command value:

ver: Version

date: Compile date

Example：

*CMDR,XX,863158022988725,000000000000,G0,V1.0,May 17 2017#

Remarks：

* This Protocol is customized by clients 's requirement for specified product functions;

* This Protocol's some parts with details would be adjusted or modified according to practical operating situation.