GPRS Communication Protocol Between GPS Tracker and Server

version V2.02

KG100/KG200/KG300/KC200

Change Version	Change Record	Date
V1.00	Build file	2008-8-21 by George
V1.01	Add parking overtime with time	2008-10-23 By George
V1.02	Change sign in to illegal ignition and add illegal ignition alarm	2008-10-23 By George
V1.10	Add user define alarm bit in alarm info	2008-12-16 By George
V1.20	Change fatigue drive alarm mode, add clear value for illegal ignition alarm , add penetrate transmit data for serial 2-7	2009-3-16 By George
V1.28	Add acc status in 0x82 packet	2009-4-30 By JGShi
V1.41	Add remote update result upload A5 command.	209-7-21 By George
V2.00	Format change and add protocol for new functions in 108	2012.5-15 By liven
V2.01	Add 8E data description	2012.12-19 By Liven
V2.02	Add command 0x71, 0xA3, 0xD3,0xD4,0xD9,0xDA, 0xDB, 0xDC, Appendix1 Position Data.	2013.06-15 By Wayne

Content

I Command Format

Commands format of GPRS Packets are defined as following:

From Server to Device:
))<Command(1byte)><L(2 bytes)><ID(4bytes)><Parameter(s)><Checksum>\r

From Device to Server:
))<Command(1byte)><L(2 bytes)><ID(4bytes)><data><Checksum>\r

Note:
1. Do not input '<' and '>' in the command content.
2. All Muti-byte data complies with the following sequence: High byte prior to the low byte (**Big Endian**).
3. The size of one location data packet is about 50 bytes.

Item	Specification
))	2bytes. It is header for all correct packets. '))' is ASCII code, in hex code it is 0x29 0x29.
Command	1 byte. It is in hex code, every packet have one and only command word. For detail, please refer to **Part II Command List**
L	2 bytes. It means the length from Length byte (not include length byte) to packet end, include the end byte. It is in hex code.

ID	4bytes. It is in hex code. Every device has one and only ID, It is calculate from the device SN.
	For example: Suppose the device SN is: 29800298
	                    Divide into 4 parts: 29 80 02 98
	                    Convert to hex: 1D 50 02 62
	                    Add 0x80 to 2nd,3rd part: 1D D0 82 62
	                    Then you get the device ID: 1DD08262

Parameter/data	Minimum 0 byte, maxmum 200byte, see appendix 1 for data description.
Checksum	1 bytes, it is xor checksum, for example: if the packet is: 29 29 B1 00 07 0A 9F 95 38 0C 82 0D 0x82= 29 xor 29 xor B1 xor 00 xor 07 xor 0A xor 9F xor 95 xor 38 xor 0C
\r	1 bytes, it is end byte of package, in hex it is 0D

II Command List

Command	Page

III Command Details

1. Login – 0xB1

Command:	))<0xB1><L><ID><reserved><Checksum><\r>
Description:	After your device installed properly, device will send this packet to server for login. It will send every 30s, like heart beat.It must be reply, If server does not give reply (see **Login confirmation**), device will keep send this packet without any other packet; after get reply, other commands start work.
Example:	29 29 B1 00 07 0A 9F 95 38 0C 82 0D
Note:	In example, the ID is 0A9F9538, change to device SN, it is 10312156. In <reserved> part 0x0C, we keep it as future use; do not have certain meaning now.

2. Login/Server Confirmation – 0x21

Command:	))<0x21><L><receive package check sum><receive package command><reserved><Checksum><\r>
Description:	This command is send from server to device, to confirm some information, like login, some important alarm, and so on.
Example:	29 29 21 00 05 82 B1 06 11 0D
Note:	The example is the confirmation for packet 29 29 B1 00 07 0A 9F 95 38 0C 82 0D, <receive package check sum> is 0x82, <receive package command> is 0xB1, <reserved> part is 0x06.

3. One time track on demand – 0x30

Command:	))<0x30><L><ID><Checksum><\r>
Description:	This command will get current location data when you send, and device only upload location data once. About the device reply, See **Reply**.
Example:	29 29 30 00 06 0A 9F 95 38 0E 0D
Note:	This command used when you want track manually, you can send this command from software platform to device.

4. One time track on demand reply – 0x81

Command:	))<0x81><L><ID><Position data><Checksum><\r>
Description:	Reply packet for track on demand command; send current position, speed, and status data to server. From device to server. About <Position data> description , please see **Appendix 1 Positon data**
Example:	29298100280A9F9538081228160131022394301140372500000330FF0000007FFC0F00001E000000000034290D
Note:	The data between <ID> and <Checksum> is Position data.

5. Tracking by Interval (Acc_On) – 0x34

Command:	))<0x34><L><ID><***Parameter***><Checksum><\r>
Description:	This is command for setting device upload by time interval when ACC on. Our device default upload interval is 30s, you can change or set it with this command, the content of *<parameter>* part is interval, and unit is second, in hex code. After receive this command, device will give **Set Reply**. And the packet send by interval to server see **Position Data Upload**.
Example:	29 29 34 00 08 0A 9F 95 38 ***00 1E*** 1A 0D
Note:	In this example, the interval is 001E, In decimal it is 30, so this command will set the device upload with interval 30s.

6. Tracking by Interval (Acc_Off) – 0x70

Command:	))<0x70><L><ID><***Parameter***><Checksum><\r>
Description:	This is command for setting device upload by time interval when ACC off. Our device default upload interval is 30s, you can change or set it with this command, the content of *<parameter>* part is interval, and unit is second, in hex code. After receive this command, device will give **Set Reply**. And the packet send by interval to server see **Position Data Upload**.
Example:	29 29 70 00 08 0A 9F 95 38 ***00 1E*** 5E 0D
Note:	In this example, the interval is 001E, In decimal it is 30, so this command will set the device upload with interval 30s.

7. Track by Distance – 0x35

Command:	))<0x35><L><ID><***Parameter***><Checksum><\r>
Description:	This command set device upload when moving a certain distance. In default device have close this function, use this command to change the upload rule to distance interval. The content of *<parameter>* part is distance interval; the unit of it is meter, in hex code. After receive this command device will send **Set Reply**, And the packet send by interval to server see **Position Data Upload**.
Example:	29 29 35 00 08 0A 9F 95 38 ***00 64*** 61 0D
Note:	In this example, the interval is 0064, in decimal it is 100, the device will upload with interval 100m.

8. Position Data Upload (by Interval, distance) – 0x80

Command:	))<0x80><L><ID><data><Checksum><\r>
Description:	This packet is send from device to server, send by interval set to device. In default, our device will send this packet every 30s after login. About the <data> description, please see **Appendix 1 Positon data**.
Example:	29 29 80 00 28 0A 81 85 0A 12 03 10 09 57 50 00 52 81 37 00 61 19 08 00 00 02 32 F8 48 FF BB FF FF 00 00 00 1E 00 00 00 00 00 00 ED 0D
Note:	The data between <ID> and <Checksum> is Position data.

9. Blind Area Data re-Upload – 0x8E

Command:	))<0x8E><L><ID><data><Checksum><\r>
Description:	This packet is send from device to server, send by interval set to device. In default, our device will send this packet every 30s after login. About the <data> description, please see **Appendix 1 Positon data**.
Example:	29 29 8E 00 28 0F 80 81 5A 12 12 18 20 31 16 02 23 18 46 11 40 22 70 00 72 02 62 FB 00 07 7C 7F BF 56 00 00 1E 3C 32 00 00 00 00 85 0D
Note:	The data between <ID> and <Checksum> is Position data.

10.   Over speed Alarm Set – 0x3F

Command:	))<0x3F><L><ID><**Parameter**><Checksum><\r>
Description:	This packet sent form server to device. It set a speed limit to device, when device speed up to or bigger than the limit, device will give a over speed alarm. About the alarm content, please see the **Alarm Info**. The unit for <parameter> is km/h
Example:	29 29 3F 00 07 0A 9F 95 38 **32** Checksum(Xor) 0D
Note:	In this command, the <parameter> is 0x32=50, means the speed limit is 50km/h.

11.   Movement Alarm – 0xC7

Command:	))<0xC7><L><ID><**Parameter**><Checksum><\r>
Description:	This command is send from server to device, to set a circle area. When device go out of the circle, it will give a move alarm. The unit of <parameter> is 10 meters. The reply for command, please see **Set Reply**.
Example:	29 29 C7 00 07 0A 9F 95 38 **0F** F7 0D
Note:	In this example, the parameter is 0F=15, so the radum is 150 meter.

12. Stop Engine (Remote Immobilize) – 0x39

Command:	))<0x39><L><ID><Checksum><\r>
Description:	This command send from server to device, when receive this command , device will give output control signal, normally we use it control vehicle oil pump, user's can use it control other part of vehicle by this control output. The reply for this command, please see **Set Reply**. Command for recover please sees **Recover Engine**.
Example:	29 29 39 00 06 0A 9F 95 38 07 0D
Note:	**This command will have physical operations to user's Car, please make two confirmation for this function in software, to make sure operations to car is safe.**

13. Recover Engine (Disable Immobilize) – 0x38

Command:	))<0x38><L><ID><Checksum><\r>
Description:	This command is undo action for command **Stop Engine**. Device gives **Set Reply** after this command.
Example:	29 29 38 00 06 0A 9F 95 38 06 0D
Note:	This command will cancel the stop engine status in **position data**, and write 0x38 in **V8** part.

14. Listen in (Voice Monitoring) – 0x3E

Command:	))<0x3E><L><ID><***Parameter***><Checksum><\r>
Description:	This command will request device make a one-way telephone to the number in <parameter> part. Parameter part use compressed BCD code. Device gives **Set Reply** for this command.
Example:	29 29 3E 00 0D 0A 9F 95 38 ***07 55 61 52 45 81 FF*** 51 0D
Note:	For <parameter> part, it use Compressed BCD code to express telephone number, if the length of the telephone number is a odd number, need add F in the end, for example: number 13590251897 should express as: 13 59 02 51 89 7F; if the length of the telephone number is a even number, need add FF in the end, for example: number 075561524581 should be expressed as 07 55 61 52 45 81 FF.

15. Set Geo-Fencing – 0x46

Command:	))<0x46><L><ID><***Parameter***><Checksum><\r>
Description:	This command will set Geo-Fences to device (only supported by 103/108/269). Device checks if Geo-Fence alarm triggered. Device give **Set Reply** to this command.
Example:	29 29 46 00 3D 0A 9F 95 38 ***03 02 23 39 95 11 35 88 69 02 23 21 23 11 40 15 84 00 00 02 23 18 95 11 40 27 79 02 23 09 81 11 40 43 03 01 00 02 23 28 84 11 40 36 03 02 23 23 51 11 40 56 22 02 00*** 6C 0D
Note:	In example, it have set 3 Geo-fences, the meaning of the parameters shows below: ***03*** //Geo-fences quantities, in this example have 3 Areas. ***02 23 39 95*** //1st Geo-Fence. Latitude for upper left corner It is 22° 33.995′

	11 35 88 69 //1st Geo-Fence. Longitude for upper left corner It is 113° 58.869′
	02 23 21 23 //1st Geo-Fence. Latitude for lower right corner It is 22° 32.123′
	11 40 15 84 //1st Geo-Fence. Longitude for lower right corner It is 114° 1.584′
	00 //Geo-Fence number, 1st one start with 00
	00 //Alarm type, 0x00 means in region alarm 0x01 means out region alarm 0x02 means alarm when both in/out alarm 0x03 means forbidden alarm
	02 23 18 95 //2nd Geo-Fence. Latitude for upper left corner
	11 40 27 79 //2nd Geo-Fence. Longitude for upper left corner
	02 23 09 81 //2nd Geo-Fence. Latitude for lower right corner
	11 40 43 03 //2nd Geo-Fence. Longitude for lower right corner
	01 //Geo-Fence number, 2nd one.
	00 //Alarm types. 0x00 means in region alarm.
	02 23 28 84 //3rd Geo-Fence. Latitude for upper left corner
	11 40 36 03 //3rd Geo-Fence. Longitude for upper left corner
	02 23 23 51 //3rd Geo-Fence. Latitude for lower right corner
	11 40 56 22 //3rd Geo-Fence. Longitude for lower right corner
	02 //Geo-Fence number, 3rd one.
	00 //Alarm type, 0x00 means in region alarm.

16. Cancel Geo-Fencing – 0x47

Command:	))<0x47><L><ID><Checksum><\r>
Description:	This command sends from server to device. It will delete all the Geo-Fences set in device.
Example:	29 29 47 00 06 0A 9F 95 38 79 0D
Note:	Device sends **Set Reply** to server after this command.

17. Inquiry GEO Fencing – 0x48

Command:	))<0x48><L><ID><Checksum><\r>
Description:	This command sends from server to device. Device will reply Geo-Fences set in device.
Example:	29 29 48 00 06 0A 9F 95 38 76 0D
Note:	Device reply 0x94 packet.

18. Send Dispatch Info – 0x3A

Command:	))<0x3A><L><ID><*info content*><Checksum><\r>
Description:	This command sends from server to device. It used in device which have dispatch LCD installed, control Center send this command to device to inform driver next mission or else. Device will show it in LCD when receive it from control center. Device will give **Set Reply** after receive this command.
Example:	29 29 3A 00 12 0A 9F 95 38 *68 65 6C 6C 6F 2C 77 6F 72 6C 64 21* 1D 0D
Note:	In this example, we send "hello, world!" to device, the parameter is the ASCII code of "hello, world!" in hex.

19. Delete Mileage – 0x66

Command:	))<0x66><L><ID><Checksum><\r>
Description:	This command sends from server to device. It will clear the mileage calculated by your device, and restart from 0.
Example:	29 29 66 00 06 0A 9F 95 38 58 0D
Note:	Device will give **Set Reply** after this command.

20. Alarm Info – 0x82

Command:	))<0x82><L><ID><*Data*><Checksum><\r>
Description:	This command sends from device to server. It is alarm data, this packet need deal with in the first class. This command words is for important and emergency situation.
Example:	29 29 82 00 23 0A A2 CC 39 *12 05 03 05 05 22 02 85 94 79 03 10 95 50 00 80 02 07 84 00 00* 00 02 00 00 00 00 00 00 75 0D
Note:	About the instruction for the <data> the parse shows below：*12 05 03 05 05 22 02 85 94 79 03 10 95 50 00 80 02 07 84 00 00* this 21 byte data check in section **Appendix 1 Position Data** please; 00 02 00 this part is alarm status data, please check the instruction in section **Appendix 2 Alarm Data**; for this example, it is over speed alarm happens. 00 00 00 00 00 this part is alarm parameters data, please check the instruction in section **Appendix 2 Alarm Data**;

21. Cancel Alarm – 0x37

Command:	))<0x37><L><ID><Checksum><\r>
Description:	This command is sends from server to device, it will clear the alarm status in device, and the alarm status will clear to 0. And it only be reset when alarm status happens again. Device will reply **Set Reply** after this command.
Example:	29 29 37 00 06 0A 9F 95 38 09 0D
Note:	This command only clear the alarm status happens before, if the alarm status is continuously, like overspeed alarm, if you speed not low down, it will keep sending this overspeed alarm.

22. Set GPRS Parameters – 0xC1

Command:	))<0xC1><L><ID><**Parameter**><Checksum><\r>
Description:	This command sends from server to device. It will change current APN, APN User，APN Password set in device. Devices reply **Set Reply** after this command.
Example:	29 29 C1 00 17 0A 9F 95 38 **22 43 4D 4E 45 54 2C 67 70 72 73 2C 67 70 72 73 22** BF 0D
Note:	The parameter part is in ASCII code, in example: **22 43 4D 4E 45 54 2C 67 70 72 73 2C 67 70 72 73 22** Means:"CMNET,gprs,gprs"

23. Set Server IP and Port In Device – 0x69

Command:	))<0x69><L><ID><**Parameter**><Checksum><\r>
Description:	This command sends from server to device. It will change current server IP and PORT set in device. Device reply **Set Reply** after this command.
Example:	29 29 69 00 1C 0A 9F 95 38 **22 31 32 31 2E 30 33 37 2E 30 35 39 2E 32 31 37 22 2C 37 37 37 37** 41 0D
Note:	Parameter part is in ASCII code. In the example, the <parameter> part: **22 31 32 31 2E 30 33 37 2E 30 35 39 2E 32 31 37 22 2C 37 37 37 37** means: "121.037.059.217",7777 **Remark:** The IP data head and tail contain a double quotation marks.

24. Set Reply – 0x85

Command:	))<0x85><L><ID><***Data***><Checksum><\r>
Description:	This package sends from device to server, for reply most of the commands send from server to device. It will put the command words of packet it reply for in the last byte of <data> part. The detail description of <Data> part please find in **Appendix 1 Position Data**.
Example:	29 29 85 00 08 1D D0 8C 22 ***12 03 12 17 40 26 02 65 45 71 03 12 54 17 00 00 00 00 F8 19 C8 39 FF FF 1D 00 00 1E 00 50 00 00 00 3A*** F9 0D
Note:	In this example, the last byte of <Data> part is 0x3A, so it is a reply packet for **Send Dispatch Info**.

25. Illegal Ignition Set -0xC6

Command:	))<0xC6><L><ID><***Parameter***><Checksum><\r>
Description:	This command sends from server to device. It will define time period when vehicle can't be started, if detect the device started in forbidden time period; device will give an alarm Illegal Ignition. Every device can set 10 time period in device. Device give **Set Reply** after receive this command.
Example:	29 29 C6 00 13 0A 9F 95 38 ***01 0C 01 01 01 14 00 0C 0C 1F 00 17 3B*** C0 0D
Note:	In this example, the <parameter> part should be parse like this: ***01*** // the serial number of time period, from 0x01~0x0A. ***0C 01 01 01 14 00*** // this is start time. First byte 0x0C is year, system need add 2000 to this part, so the value range of year is 2000~2255, so 0x0C means 2012; second byte 0x00 is for month, value range is 01~0C, in example 0x01 means JAN; the third byte 0x01 is day, value range is 01~1F; the fourth byte 0x01 means week, value range is 1~7, 7 means Sunday; the fifth byte means hour, value range is 0~17h, 0x14 means 20:00; the last byte is min, value range is 0~3B. ***0C 0C 1F 06 17 3B*** // this is end time, define is the same with start time. When set year month week day set to 0, means device do not check that part, just check time.

26. Device Factory Reset – 0xC3

Command:	))<0xC3><L><ID><Checksum><\r>
Description:	This command sends from server to device, command will recover all the settings except IP/PORT/APN/APN user/APN password to device include time interval, over speed setting, and mileage and so on to factory set. Device give **Set Reply** after receive this command.
Example:	29 29 C3 00 06 0A 9F 95 38 FD 0D
Note:	Attention, this command will clear all the alarm settings and mileage count data, be careful when send this command.

27. Set Vehicle Idle Alarm – 0x4B

Command:	))<0x4B><L><ID><***Parameter***><Checksum><\r>
Description:	This command sends from server to device, it will set a time during to device, if device detect that the vehicle is engine on and speed<10km/h for the time during set or longer, device will send a vehicle Idle alarm. You can find the alarm packet in **Alarm Info**, and find alarm status instruct in **Appendix 2 Alarm data**.
Example:	29 29 4B 00 07 0A 9F 95 38 ***14*** 60 0D
Note:	The parameter unit is minute, in this example, 0x14 means 20 minutes.

28. Check Device Version – 0x3D

Command:	))<0x3D><L><ID><Checksum><\r>
Description:	This command sends from server to device, to check the firmware version of device. Device will reply **0x84** to this command.
Example:	29 29 3D 00 06 0A 9F 95 38 03 0D
Note:	This command is for firmware version check only. For some basic mode of tracker like 101A, old version of firmware may do not support this command.

29. Check Device Version Reply – 0x84

Command:	))<0x84><L><ID><***Data***><Checksum><\r>
Description:	This command is reply for firmware check, send from device to server. <Data> part is firmware version of this device, in ASCII code.
Example:	29 29 84 00 31 0A A2 8A 07 ***54 33 36 30 2D 31 30 33 41 57 28 47 54 4D 29 56 32 2E 30 31 20 40 20 53 65 70 20 32 33 20 32 30 31 31 20 31 32 3A 34 38 3A 31 38*** CF 0D
Note:	In this example, the firmware version of this device is : T360-103AW(GTM)V2.01 @ Sept. 23 2011 12:48:18

30. Get Current Address – 0xA8

Command:	))<0xA8><L><ID><***Data***><Checksum><\r>
Description:	This command is used when customer need to get detail address, like building, street, city. With our 101A and 101E device. Customer can send SMS command: AS1234WHERE1# to device, device sends this command to server to require address from server. About the reply please see **Get Current Address Reply**.
Example:	29 29 A8 00 28 0A A2 8A 07 ***12 03 12 17 40 26 02 65 45 71 03 12 54 17 00 00 00 00 F8 19 C8 39 FF FF 1D 00 00 1E 00 50 00 00 00 00*** 95 0D
Note:	The <Data> part is current position data, you can check the instruct about it in **Appendix1 Position Data**.

31. Get Current Address Reply – 0x72

Command:	))<0x72><L><ID><***Data***><Checksum><\r>
Description:	This command is reply for address requirement 0xA8, the address is <Data> part, coding in Unicode. Device will get the <Data> part of address and send SMS to the customers mobile phone who require the address.
Example:	29 29 72 00 5B 0A A2 8A 07 ***00 00 54 00 65 00 6D 00 61 00 20 00 2D 00 20 00 53 00 61 00 64 00 66 00 61 00 2C 00 20 00 53 00 61 00 6C 00 61 00 6D 00 6F 00 75 00 6E 00 2C 00 20 00 4D 00 61 00 72 00 6B 00 61 00 7A 00 20 00 54 00 61 00 6D 00 61 00 2C 00 20 7D 22 54 C8 67 70 57 C3 53 CA*** 89 0D
Note:	In this example, the address get from server is :

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32. Remote Update Firmware – 0xD2

Command:	))<0xD2><L><ID><**Data**><Checksum><\r>
Description:	This command is used for update firmware by GPRS. It is used when device have new function or bugs need be fixed remotely. When received this command device will check and connect to certain update TFTP sever to download the new firmware file then update. Device will give **Set Reply** after receive this command.
Example:	29 29 D2 00 2D 0A A2 8A 07 **01 31 32 31 2E 30 33 37 2E 30 35 39 2E 32 31 37 22 C1 6E 65 77 2E 62 69 6E 00 00 00 00 00 00 00 00 00 00 00 00 00** 2F 0D
Note:	The <data> part in the example parsed as below: **01** //Update type, if it is 0x00, then cancel update; when it is 0x01 then force update. **31 32 31 2E 30 33 37 2E 30 35 39 2E 32 31 37** //update server IP: 121.037.059.217; 15 bytes of data in ASCII code. **22 C1** //Update server port:8897 ; data is Big Endian **6E 65 77 2E 62 69 6E 00 00 00 00 00 00 00 00 00 00 00 00 00** //file names: new.bin, 20bytes (add 00 when less than 20 bytes), in ascii code.

33. Remote Update Firmware Result – 0xA5

Command:	))<0xA5><L><ID><**Data**><Checksum><\r>
Description:	This command is uploading by device. After firmware update, device will upload this packet to software, to show update successful or not. The flag for successful is in the last byte of <Data> part, when it is 0x00, it means update successful, if it is not 0x00, means update failed.
Example:	29 29 A5 00 28 0A A2 8A 07 **12 03 12 17 40 26 02 65 45 71 03 12 54 17 00 00 00 00 F8 19 C8 39 FF FF 1D 00 00 1E 00 50 00 00 00 00** 98 0D
Note:	The <Data > part is position data, the last byte of it is 0x00, it is V8 of position data. In this command it means update successful.

34. Camera Related Command – 0x28/0x65/0x26/0xAB

Please refer to file <<KHD Take Photo Protocol V1.0>>.

35.　Temperature alarm set – 0x71

Command:	))<0x71><L><ID><***Parameter***><Checksum><\r>
Description:	This command is used to configure the temperature abnormal alarm parameter.
Example:	29 29 71 00 0B 0A 9F 95 38 ***Byte1 Byte2 Byte3 Byte4 Byte5*** Xor 0D
Note:	**1).** ***Byte1***: Temperature abnormal alarm enable/disable mark byte. Example, Byte1=0x00 disable, Byte1=0x01 enable. ***Byte2Byte3***: Temperature upper limit value, unit 1/10℃. Signed short integer, the MSB used to be a sign bit. Example, Byte2Byte3=0x0123=291, so it means the upper temperature limit is 291/10=29.1℃. ***Byte4 Byte5***: Temperature drop limit value, unit 1/10℃. Signed short integer, the MSB used to be a sign bit. Example, Byte4Byte5=0x8123=-291, so it means the drop temperature limit is -291/10=-29.1℃. **2).** Device reply by command 0x85, and set data field V8=0x71 to indicate ACK. **Remark:** Only connected temperature sensor will have this function. Default enable.

36.　Peripheral data info upload –0xA3

Command:	))<0XA3><L><ID><***Parameter***><Checksum><\r>
Description:	This packet will be send from device to server by set interval time to replace the command packet 0x80 when device has connected peripheral unit like fuel tank sensor, temperature sensor etc. Anyway, this packet equal 0x80 packet, but added peripheral sensor data.

Example:	29 29 A3 L 0A 9F 95 38 **Location_info Peripheral_data** Xor 0D
Note:	**1).** **Location_info**: Please see **Appendix 1 Positon data**. **Peripheral_data**: see Appendix 3 peripheral data.

37. Fuel level sensor Parameter Set – 0xD3

Command:	))<0xD3><L><ID><**Data**><Checksum><\r>
Description:	This command is used to configure the fuel sensor parameter to the device from server.
Example:	29 29 D3 00 0B 0A A2 8A 07 **Byte1 Byte2 Byte3 Byte4 Byte5** Xor 0D
Note:	**1).** **Byte1 Byte2:** used to indicate the fuel sensor voltage when fuel tank is empty. **Byte3 Byte4:** used to indicate the fuel sensor voltage when fuel tank is full. **Byte5:** used to indicate the fuel sensor type, 0x00 means using vehicle original fuel sensor, 0x01 means using external fuel sensor. **2).** Device reply by command 0x85, and set data field V8=0xD3 to indicate ACK. **Remark:** Only T360-108 device support. Default enable.

38. Real-time tracking by Interval – 0xD4

Command:	))<0xD4><L><ID><**Parameter**><Checksum><\r>
Description:	This command is used to configure the real-time tracking parameter.
Example:	29 29 D4 00 0A 0A 9F 95 38 **Byte1 Byte2 Byte3 Byte4** Xor 0D
Note:	**1).** **Byte1Byte2:** used to configure the real-time tracking location

info upload times.

Example, Byte1Byte2=0x0064=100, means that device will upload location point info by Byte3Byte4 interval and up to 100 times, this command will be lose efficacy.

Expressly, Byte1Byte2=0x0000 means stop the real-time tracking, and Byte3Byte4=0xFFFF means current real-time tracking is always effective until be changed.

Byte3Byte4: used to configure the real-time tracking interval.
Example, Byte3Byte4=0x001E=30, means that the real-time tracking interval is 30sec.

2).
Device reply by command 0x85, and set data field V8=0xD4 to indicate ACK.

39.   Tracking compensation by angle – 0xD9

Command:	))<0xD9><L><ID><**Parameter**><Checksum><\r>
Description:	This command is used to configure the tracking compensation of angle parameter. When vehicle make a turn more than this angle value, device will upload one location info.
Example:	29 29 D9 00 D7 0A 9F 95 38 **Byte1** Xor 0D
Note:	**1).** **Byte1** : The angle value configured, the unit is degree. Example, Byte1=0x1E(30 degree), means that when vehicle make a turn more than 30degree, device will upload one location info. **2).** Device reply by command 0x85, and set data field V8=0xD9 to indicate ACK.

40.   Fatigue driving alarm set – 0xDA

Command:	))<0xDA><L><ID><**Parameter**><Checksum><\r>
Description:	This command is used to configure the fatigue driving alarm parameter.

Example:	29 29 DA 00 0A 0A 9F 95 38 **Byte1 Byte2 Byte3 Byte4** Xor 0D
Note:	**1).** **Byte1 Byte2**: Maximum driving time limit, unit minute. Example Byte1Byte2=0x0102 (0x0102=258), means the max driving time limit is 258minutes. Specially, when Byte1Byte2=0x0000, means cancel checking this alarm. **Byte3 Byte4**: The minimum driver to need a reset time, unit minute. Example Byte3Byte4=0x0014 (0x0014=20), means that the minimum driver to need a reset time is 20minutes. **2).** Device reply by command 0x85, and set data field V8=0xDA to indicate ACK.

41.　Over Speed alarm and trig-time set – 0xDB

Command:	))<0xDB><L><ID><**Parameter**><Checksum><\r>
Description:	This command is used to configure the over speed and trig-time limit val.
Example:	29 29 DB 00 09 0A 9F 95 38 **Byte1 Byte2 Byte3** Xor 0D
Note:	**1).** **Byte1**: Over speed value limit, unit km/h. Example Byte1=0x64 (0x64=100), means the speed limit is 100km/h. Specially, Byte1=0x00 means cancel over speed alarm checking. **Byte2 Byte3**: Over speed trig-time limit, unit sec. Example Byte2Byte3=0x000A (0x000A =10), means that the over speed limit trig-time is 10sec. **2).** Device reply by command 0x85, and set data field V8=0xDB to indicate ACK. Only T360-108 device support this command.

42.   Device odometer value set – 0xDC

Command:	))<0xDC><L><ID><*Parameter*><Checksum><\r>
Description:	This command is used to set the device odometer value.
Example:	29 29 DC 00 08 0A 9F 95 38 ***Byte1 Byte2*** Xor 0D
Note:	***1).*** ***Byte1 Byte2***: The device odometer value setting, unit Km, unsigned short integer. Example Byte1Byte2=0x0123=291, means that setting device odometer value to 291Km. ***2).*** Device reply by command 0x85, and set data field V8=0xDC to indicate ACK.

Appendix 1 Position Data

There have 2 kinds of Position data, one is for normal position data, and another is for alarm data (such as 0x82).

1. ymdhms wwww jjjj ssff st lichen1 lichen2 lichen3 st1st2st3st4 v1v2v3v4v5v6v7v8

Ex: 12 03 12 17 40 26 02 65 45 71 03 12 54 17 00 00 00 00 F8 19 C8 39 FF FF 1D 00 00 1E 00 50 00 00 00 00

2. ymdhms wwww jjjj ssff p load sign   (for alarm packet)

Ex: 12 05 03 05 05 22 02 85 94 79 03 10 95 50 00 80 02 07 84 00 00

From the format, we can see that these 2 kinds of data have same part: **ymdhms wwww jjjj ssff st,** and different parts: **lichen1 lichen2 lichen3 st1st2st3st4 v1v2v3v4v5v6v7v8** and **load sign.**

Will describe it in 3 parts:

I. instruct for ymdhms wwww jjjj ssff

Field Name	Length(Byte)	Content	Note
Datetime	6	ymdhms 12 03 12 17 40 26	Date range: Year, 2000-2099; Month 1-12; Day, 1-31; Time range: Hour, 00-23; Min, 00-59; Second, 00-59. Hour/min/second use compressed BCD code For example: 12 03 12 17 40 26 means 2012-3-12 17:40:26
Latitude	4	wwww 02 65 45 71	Latitude range: 00°00.000′~89°59.999′. Use compressed BCD code, But the highest bit is sign bit. "Positive" Means "North Latitude", "negitive" means "south latitude"; The Unit for ′ is 0.001′ For example: South latitude 30°37.901′ express as: 83H, 03H, 79H, 01H 02 65 45 71 means: north latitude 26°54.571′.
Longitude	4	jjjj 03 12 54 17	Longitude range: 000°00.000′~179°59.999′; Use compressed BCD code, the highest bit is sign bit. "Positive" Means "east longitude", "negitive" means "West longitude"; The Unit for ′ is 0.001′ For example: west longitude 130°45.608′ express as: 93H, 04H, 56H, 08H 03 12 54 17 means: 31°25.417′.
Speed	2	ss 00 80	Speed express method: Range: 0-9999km/h

				Use compressed BCD code. For example: 120km/h express as: 01H, 20H
Direction	2	ff 02 07		Direction range: 000-359° Use compressed BCD code, true North is 0°, clockwise counting. The unit is degree. For example: 154° express as: 01H, 54H 02 07 means 207°.

II.Instruct for st lichen1 lichen2 lichen3 st1st2st3st4 v1v2v3v4v5v6v7v8

Field Name	Length (Byte)	Content	Note			
GPS/antenna /power status	1	st F8	D7	0 Unlocated	1 Located	
			D6	1 1 GPS Normal 1 0 GPS antenna short		
			D5	0 1 GPS antenna cut 0 0 GPS module error		
			D4	1 1 main power normal 1 0 main power lose		
			D3	0 1 main power too high or too low		
			D2	**D2D1D0**:		
			D1	**010**: odometer unit Km.		
			D0	011: Version from V2.02. Other value reserve. normally **000**		
			In the example F8 =11111000, means located/gps normal/power normal/aw protocol			
Mileage	3	lichen1 lichen2 lichen3 19 C8 39	HEX format 0x00-0XFFFFFF (16777215) meters. 19 C8 39 means 1689657m			
Status	4	st1st2st3st4 FF FF 1D 00	bit	St1	St2	St3	St4

bit	St1	St2	St3	St4
D7	1 acc off 0 acc on	1 normal 0 SOS	1 Fatigue driving 0 normal	1 output(1) 0 no output
D6	1 self-define(1) no alarm 0 alarm happen	1 normal 0 over speed	1 need reply 0x21 0 do not need reply	1 output(2) 0 no output
D5	1 user define (2) no alarm 0 alarm happen	1 normal 0 stop overtime	1 Temperature abnormal 0 normal	1 GPRS traffic Abnormal 0 normal
D4	1 user define (3) no	1 normal	CSQ value:	1 have taxi

	alarm 0 alarm happen	0 out area alarm	0~31	meter 0 no taxi meter
D3	1 user define (4) no alarm 0 alarm happen	1 normal 0 in area alarm		1 have broadcast 0 no voice broadcast
D2	1 fuel pump not cut 0 fuel pump cut.	1 user define (5) no alarm 0 alarm happen		1 forbid dial out 0 allow dial out
D1	1 not sign in 0 sign in	1 user define (6) no alarm 0 alarm happen		1 forbid call in 0 allow call in
D0	1 not defencing 0 defencing	1 user define (7) no alarm 0 alarm happen		1 forbid call 0 allow call

FF FF 1D 00 means acc off / no self define alarm / no immobilize/ not sign in/ no defence/ no alarms/ gprs registerd/no need reply 0x21 command/ UDP mode/ csq=29/no accessories.

Field Name	Length	Content	Note
V1V2 ~~upload interval~~	2	**v1v2** ~~00 1E~~	~~This 2 byte is upload time interval.~~ ~~00 1E means 30seconds~~ A random number, used for device remote debug.
V3 stop over time setting	1	**v3** ~~00~~	This part is parking/stop over time setting value, in default it is 00. A random number, used for device remote debug.
V4 ~~over speed setting~~	1	**v4** ~~50~~	This value is speed limit setting to device, 0x50 means the limit is 90km/h; in default it is 00. A random number, used for device remote debug.
V5 ~~GEO Fencing number~~	1	**v5** ~~00~~	~~This is numbers of GEO Fencing setting in deivce, in default it is 00.~~ A random number, used for device remote debug.
V6 ~~login~~	1	**v6** ~~00~~	~~Driver login status, used when connect RFID device.~~ A random number, used for device remote debug.
V7 ~~upload picture interval~~	1	**v7** ~~00~~	~~This is used when set take picture by time interval to device, device upload picture in a certain interval. In default it is 00~~ A random number, used for device remote debug.
V8 command word send by control center	1	**v8** 00	This is used when reply to command send by control center, device put the command word send by control center to this byte.

III. Instruct for p load sign

Field Name	Length(Byte)	Content	Note

GPS/antenna /power status	1	**p** **84**	D7	0 Unlocated	1 Located
			D6	0 do not use DGPS 1 have use DGPS	
			D5	reserved	
			D4		
			D3	Satellite number received by device. 0~15	
			D2		
			D1		
			D0		
			In the example 84 =10000100, means located/do not use DGPS/4 satellites visiable		
Empty-loaded status	1	**load**	Use compress BCD code, 1 = load; 0=empty		
Sign up status	1	**sign**	Use compress BCD code, 1=sign in; 0=sign out		

Appendix 2 Alarm Data

In alarm info packet, there have 8 bytes of data to describe the alarm status and alarm parameters. For example: 29 29 82 00 23 0A A2 CC 39 **12 05 03 05 05 22 02 85 94 79 03 10 95 50 00 80 02 07 84 00 00 00 02 00 00 00 00 00 00** 75 0D. The part **00 02 00 00 00 00 00 00** is what we will describe in this part.

About the 8 bytes of data, first 3 bytes for alarm status and 5 bytes for alarm parameters.

I. Instruct for alarm status **00 02 00**

	1st byte	2nd byte	3rd byte	
D7	In area alarm	Door open alarm (User define(3) alarm)	Idle alarm	
D6	Out area alarm	Tow alarm	Fatigue alarm	
D5	Offset router alarm	G Sensor alarm (see 4th byte in alarm parameters)	Parking status	
D4	Low power alarm	User define (4) alarm	SIM removed alarm (101A)	
D3	User define(5) alarm	Power cut alarm	GPRS flow over limit alarm	
D2	User define(2) alarm	Stop over time alarm	**Temperature abnormal**	
D	User define(1)	Over speed	Reserved	

1	alarm	alarm		
D0	Illegal ignition alarm	Panic alarm	Reserved	

1 means alarm happen; 0 means no alarm. So 00H 02H 00H = 00000000B 00000010B 00000000B means **over speed** alarm; 00H 00H 04H = 00000000B 00000000B 00000100B means **Temperature Abnormal.**

II. Instruct for alarm parameters <mark>*00 00 00 00 00*</mark>

	1st byte	2nd byte	3rd byte	4th byte	5th byte
D7	Geo-Fence Number of GEO Fence alarm	Reserved	Route number of Offset route alarm	Crash alarm	Reserved
D6		Reserved		Turnover	Reserved
D5		Reserved		Harsh Acceleration	Reserved
D4		Reserved		Harsh deceleration	Reserved
D3		Reserved		Shake alarm (detect when acc off)	Reserved
D2		User define (7) alarm		Reserved	Reserved
D1		User define (6) alarm		Reserved	Reserved
D0		ACC status (0 on ;1 off)		Reserved	Reserved

Sign up status	1	**sign**	Use compress BCD code, 1=sign in; 0=sign out

Appendix 3 peripheral data

Peripheral data structure:

Field Name	Length(Byte)	Description
All KLV data length	2	The data length of all KLV list.
KLV data list	N	KLV list, see **Peripheral data KLV list** as follow.

Peripheral data KLV list:

K(key)	L(length)	V(value)
0x01	N	Reserve.
0x02	N	Reserve.
0x03	11	RFID action info: Byte1(0:sign off, 1:sign on) + Byte2~Byte11(ascii string, filling 0x00 to the remaining bytes when less than 10 bytes).
0x04	N	Reserve.
0x05	N	Reserve.
0x06	N	Reserve.

0x07	N	Reserve.
0x08	N	Reserve.
0x09	3	
0x0A	N	Reserve.
0x0B	N	Reserve.
0x0C	N	Reserve.
0x0D	2	Temperature value. Bit15: signed mark, Bit0-14: value. The unit is 0.1℃. For example: 0x000A = 1℃, 0x800A=-1℃.
0x0E	1	Fuel tank level percent: 0-100%.
0x0F	N	Reserve.
0x10	N	Reserve.
0x11	N	Reserve.

KLV structure frame:

K(1byte): the key id of the data part.

L(1byte): the length of the data part of **V**.

V(nbyte): the value of the data part.

For example, Temperature sensor KLV: 0x0D 0x02 0x00 0x0A, means 1℃.