CC830/CC630 GPRS Communication Protocol

This Protocol is used for communication between real time tracking platform server and the tracker device, command & message from server to device is download command & message, command & message from device to server is upload command & message. The command & message is transfer by TCP/IP through GPRS .

Suit for GPS Tracker:
CCTR-620+、CCTR-622+、CCTR-630、CCTR-800+、CCTR-803+、CCTR-830+、

Version

This protocol is compatible with protocol of CC828, it is based on the protocol of CC828 and add upload LBS location to sever, and add new heart beat data stream.

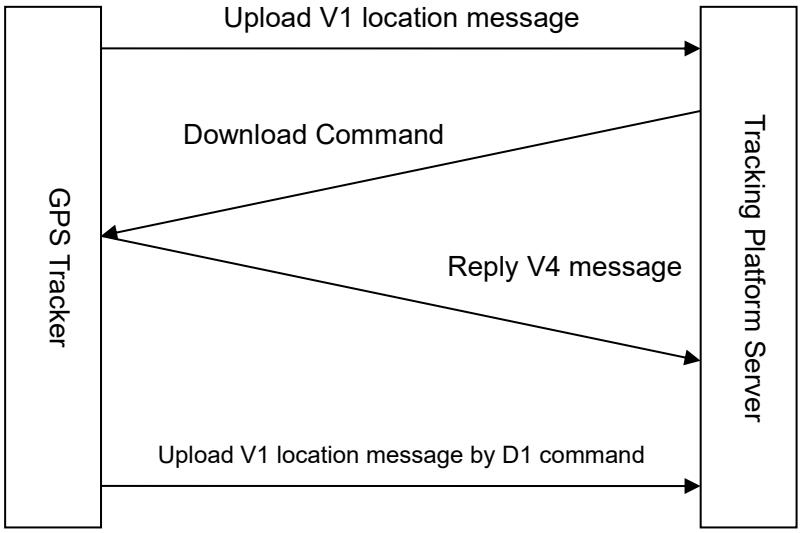
Version 3.0	**Date 2014-11-18**	**First Released**
Version 3.1	**Date 2016-03-21**	**Add Link Command**

Notes:

The following message & command words and symbols all are english upper case letters, blank and other symbol are illegal.

1. Message Data Frame Format

The command & message between device and server is transferred with data frame format, the protocol is based on TCP/IP , the full format data frame definition is as follow:



The tracker start the connection to server, and upload the V1 location message to the server, the server will check the tracker ID and decide to let the tracker login the server or not. After the tracker login, the tracker will upload the V1 location message to server, and the server will reply V4 message, the server will display the tracker status on the platform by different information in the V1 location message. If the connection is break, after a few minutes the status display on the platform will change to offline.

Message data format is as follow (16 hex format):

Number	00	01	02	03	04	05	06	07	08	09	0A	0B
Meaning	Head	ID number					Time(H/M/S)			Date(D/M/Y)		
Example	24	14	00	04	61	68	05	03	16	22	07	14

Number	0C	0D	0E	0F	10	11	12	13	14	15	16	17
Meaning	Latitude				Fixed	Longitude (N .E . V)					Fixed	Fixed
Example	22	12	87	45	00	11	34	66	57	4C	00	00

Number	18	19	1A	1B	1C	1D	1F
Meaning	Fixed	Vehicle Status				Fixed	Counter
Example	00	FF	FF	FB	FF	FF	00

Description:
Head: 0x24, means the shake hand data beginning.
ID number: 0x1400046168, means the tracker ID number is 1400046168.
Time : 0x050316, means time is 05 hour 03 minute 16 seconds.
Date: 0x220714, means date is Year 2014 month is 07 and day is 22.
Latitude: 0x22128745, means latitude is 22 degree 12.8745 minute.
Longitude: 0x113466574C, means longitude is 113 degree 46.6574 minute.

Number 15 low 4 bit definition:
Bit3: 1: East Longitude, 0: West Longitude.
Bit2: 1: North Latitude, 0: South Latitude.
Bit1: 1: A (GPS Available) 0:V (GPS not available)
Bit0: Fixed 0.

Vehicle Status is same with the following 2 definition.
Counter: From 0 count, every time send one shake hand data add 1.

2. Message & Status Upload (Tracker to Platform)

***HQ,YYYYYYYYYY,VV,HHMMSS,S,latitude,D,longitude,G,speed,direction,DDMMYY,vehicle_status#**

Note: * : Message Head Symbol, 1 byte.

HQ: Fixed Command, HQ is GPS Tracker Using Command, CC is remote control command.2 byte.

, : Delimiter (separator character).

YYYYYYYYYY: Tracker ID number (Normally is the 10 digital of the IMEI number after remove the last 1 digital, or the last 10 digital of the serial number),10 byte.

VV=V1: Normal message, for example Login message, Shake hand Message, Location Message, Alarm Message etc. 2 byte.

HHMMSS: GPS Time (GMT time), 6 byte.

S: GPS data valid or not (A/V), A means GPS data is valid, V means GPS data is invalid. 1 byte.

latitude ： Latitude, Format is DDFF.FFFF, DD: the degree of the latitude(00 ~ 90), FF.FFFF： the minute of the latitude(00.0000 ~ 59.9999), keep 4 digitals behind the radix point, 9 bytes.

D: South or North of the Latitude(N: North,S:South),1 byte.

Longitude: Longitude, Format is DDDFF.FFFF, DDD: the degree of the longitude(00 ~ 180), FF.FFFF ： the minute of the longitude(00.0000 ~ 59.9999), keep 4 digitals behind the radix point, 10 bytes.

G: East or West of the Longitude(E: East,W:West),1 byte.

Speed: Speed, from 000.00 ~ 999.99 miles/hour, keep 2 digitals behind the radix point, 6 bytes. This data maybe is nop, means

the speed os zero, for example: longitude,G,,direction,means the speed is 0.

Direction: direction angle, the north is 0 degree, the other direction is the angle from the north, total is 360, clock wise, 3 bytes. This data maybe is nop, means the speed os zero, for example: longitude,G,speed,, MMDDYY, means the degree is 0.

DDMMYY: GPS date, Day/Month/Year(GMT Date), 6 bytes.

vehicle_status: Vehicle Status, 4 bytes, indicate the status of the vehicle running, Accessory status or Alarm status etc. ASCII symbol indicate the status, the following is the definition of every bit, Bit=0 means active.

#: Message End Symbol, 1 byte

Bit	Byte 1		Byte 2		Byte 3		Byte 4	
0	0	Temperature alarm	0	GPS fault alarm	0	Door Open	0	Shock Alarm
1	0	Password error alarm	0	Battery Low Alarm	0	Arm	0	SOS Alarm
2	0	GPRS error alarm	1	Nop	0	ACC Off	0	Over Speed
3	0	Turn off Engine	0	Use Backup Battery	1	Nop	0	Start engine alarm
4	0	Power Down Alarm	0	Battery Removed	1	Nop	0	Enter Geo-fence alarm
5	0	High Triggered Sensor 1 is High	0	No GPS Antenna	0	Engine Start	0	No GPS Antenna
6	0	High Triggered Sensor 2 is High	0	GPS antenna Shot	1	Nop	0	GPS antenna Shot
7	0	Low Triggered Sensor 1 is GND	0	Low Triggered Sensor 2 is GND	0	Over Speed	0	Break Geo-fence alarm

Message Example:

Login Message: Tracker login platform, send once is OK, the platform is not necessary to reply any information:
***HQ,1400046168,V1,055600,A,2234.3066,N,11351.6829,E,000.0,000,080813,FFFFFBFF#**
Location Message: same with login message,GPS data valid symbol is A, the platform is not necessary to reply any information:
***HQ,1400046168,V1,055600,A,2234.3066,N,11351.6829,E,000.0,000,080813,FFFFFBFF#**
If GPS data valid symbol is V, then the location should not be updated, only Online status can be updated.
Alarm Message: Shcok alarm(Byte 4 bit 0 is 0), the platform is not necessary to reply any information:
***HQ,1400046168,V1,055600,V,2234.3066,N,11351.6829,E,000.0,000,080813,FFFFFFFE#**

3. Shake Hand (Heart Beat Packet)/Turn/Step Upload (Tracker to Platform)

If no new location message upload to platform, tracker will upload heart beat packet to platform to keep the link to platform, also this command can upload other message to platform, for example: turn over time for sleep detection or step information for sports record.

***HQ,YYYYYYYYYY,LINK,HHMMSS,GSM,GPS,BAT,STEP,TURNOVER,DDMMYY,vehicle_status#**

Note: * : Message Head Symbol, 1 byte.

HQ: Fixed Command, HQ is GPS Tracker Using Command, CC is remote control command.2 byte.

, : Delimiter (separator character).

YYYYYYYYYY: Tracker ID number (Normally is the 10 digital of the IMEI number after remove the last 1 digital, or the last 10 digital of the serial number),10 byte.

LINK: tracker upload heart beat command, 4 byte.

HHMMSS: GPS Time (GMT time), 6 byte.

GSM: GSM signal strength.

GPS: GPS satellite number.

BAT: Battery percentage (1-100).

STEP: Step counter for sport record.

TURNOVER: Turn over sensor counter for sleep detection.

DDMMYY: GPS date, Day/Month/Year(GMT Date), 6 bytes.

vehicle_status: Vehicle Status, 4 bytes, indicate the status of the vehicle running, Accessory status or Alarm status etc. ASCII symbol indicate the status, the definition of every bit is same with the above list.

#: Message End Symbol, 1 byte.

Example of Heart Beat Packet:

***HQ,1400046168,LINK,160138,31,10,100,10000,10,280814,FFFFFFBF#**

4. Get location description in english (Tracker to Platform):

***HQ,YYYYYYYYYY,V8,en,HHMMSS,S,latitude,D,longitude,G,speed,direction,DDMMYY,vehicle_status#**

Note:VV=V8: send command to platform to get the location description in english, 2 bytes.

en: get the location description in english.

The other is same with above.

For Example send message to platform to get location description in english:

*HQ,1400046168,V8,en,075738,A,2234.3066,N,11351.6829,E,000.0,000,080813,FFFFFBFF#

5. Confirm Message to Platform(Tracker to Platform):

*HQ,YYYYYYYYYY,V4,CMD,hhmmss,HHMMSS,S,latitude,D,longitude,G,speed,direction,DDMMYY,vehicle_status#

Note: CMD: The command been Confirmed by tracker, 3 bytes.
Hhmmss: The time of the command sending been confirmed, 6 bytes.
The other is same with above.

6. General Download Message (Platform to Tracker)

*HQ,YYYYYYYYYY,CMD,HHMMSS,PARA1,PARA2,…#

Note: * : Message Head Symbol, 1 byte.
HQ: Fixed Command, HQ is GPS Tracker Using Command, CC is remote control command.2 byte.
, : Delimiter (separator character).
YYYYYYYYYY: Tracker ID number (Normally is the 10 digital of the IMEI number after remove the last 1 digital, or the last 10 digital of the serial number),10 byte.
CMD: Command sending from the platform. 2-3 bytes.
HHMMSS: Download command Time (Server time), 6 byte.
PARA1,PARA2,...: Parameters, the length is not fixed.
#: Message End Symbol, 1 byte.

7. General Download Message (Platform to Tracker)

Arm the car from the platform:
*HQ,1400046168,SCF,135645,0,0#
Disarm the car from platform:
*HQ,1400046168,SCF,135715,1,1#
Reset and re-power on the tracker:
*HQ,1400046168,R1,150958#
Back to factory configuration:
*HQ,1400046168,S25,150114#
Set IP(58.64.155.133) and port (8011), Repeat 5 times:
*HQ,1400046168,S23,150233,58,64,155,133,8011,5#
Set over speed alarm 60km/h(about 32 miles/hour):
*HQ,1400046168,S14,150345,32#
Turn off Car oil power continually (Keep output low), time is 30 seconds:
*HQ,1400046168,S20,150637,1,30#
Turn off Car oil power with interval (output low with interval), time is 30 seconds:

***HQ,1400046168,S20,150726,0,30#**

Turn on car engine oil power:

***HQ,1400046168,S20,150600,0,0#**

Listen in car, Listen phone number:13987654321, tracker will call back this number, pick up the calling is OK.

***HQ,1400046168,R8,150835,13987654321#**

Reset alarming from platform

***HQ,1400046168,R7,150922#**

Set TCP upload time interval is 30 seconds

***HQ,1400046168,D1,151033,30,1#**

8. Platform Reply Location Description in English Message (Platform to Tracker):

Platform will reply the following message to tracker after receive the get location description in english command (V8):

***HQ,YYYYYYYYYY,I2,en,HHMMSS,DisplayTime,Code,Info_lenHQ,Information**

Note: * : Message Head Symbol, 1 byte.

HQ: Fixed Command, HQ is GPS Tracker Using Command, CC is remote control command.2 byte.

, : Delimiter (separator character).

YYYYYYYYYY: Tracker ID number (Normally is the 10 digital of the IMEI number after remove the last 1 digital, or the last 10 digital of the serial number),10 byte.

I2: Reply Command from the platform (reply the location description in english command), 2 bytes.

en: Indicate the reply the location description is english, 2 bytes.

HHMMSS: Download command Time (Server time), 6 byte.

DisplayTime: displaytime on screen, Unit is seconds, from 0-65535.

Code: code farmat, 1 is Unicode.

Info_lenHQ: Indicate the length of the information, from 1 to 256.

Information: Location Description in english content.

For Example: (The Blue is english location words, ucs2 encode):

***HQ,1400046168,I2,en,161021,10,1,26,00350030003100200058006900780069006100600e00670020004100760065006e00750065002c00200042006100600f00270061006e002c00200053006800650060e007a00680065006e002c002000470075006100600e00670064006f006e0067002c00200043006800690060e0061002c002000350031003800310032003600**

9. Platform Get Tracker Battery \ GSM Signal \ GPS Satellite (CK Command):

Platform send command to tracker to get the tracker battery power / GSM signal / GPS satellite information, the command is as follow:

***HQ,YYYYYYYYYY,CK,HHMMSS#**

Note: * : Message Head Symbol, 1 byte.

HQ: Fixed Command, HQ is GPS Tracker Using Command, CC is remote control command.2 byte.

, : Delimiter (separator character).

YYYYYYYYYY: Tracker ID number (Normally is the 10 digital of the IMEI number after remove the last 1 digital, or the last 10 digital of the serial number),10 byte.

CK: Check command from the platform to tracker, 2 bytes.

HHMMSS: Download command Time (Server time), 6 byte.

#: Message End Symbol, 1 byte.

Platform check command example:

***HQ,1400046168,CK,160168#**

The Tracker Reply Information:

***HQ,1400046168,V4,CK,gsm,gps,bat,160168,160188,A,2234.3066,N,11351.6829,E,00.00,000,080813,FFFFFBFF#**

Gsm: GSM signal , 0-31

Gps: GPS satellite

Bat: Battery power (percentage)

10. Tracker Upload LBS Location Message to Platform Server (NBR Command):

Platform send LBS location (Locate by GSM network without GPS) to server, the command is as follow:

***HQ,YYYYYYYYYY,NBR,HHMMSS,MCC,MNC,TA,NUM,LAC,CID,RXLEV ,LAC, CID,RXLEV….,DDMMYY,vehicle_status#**

Note: * : Message Head Symbol, 1 byte.

HQ: Fixed Command, HQ is GPS Tracker Using Command, CC is remote control command.2 byte.

, : Delimiter (separator character).

YYYYYYYYYY: Tracker ID number (Normally is the 10 digital of the IMEI number after remove the last 1 digital, or the last 10 digital of the serial number),10 byte.

NBR: Upload LBS location to sever command, 3 bytes.

HHMMSS: Download command Time (Server time), 6 byte.

MCC: MCC Country Code (3 Byte)

MNC: MNC Network Code (3 Byte)

TA: GSM Delay Time

NUM: GSM Base Station Number, max is 6.

LAC: LAC Location Code(5 Byte)

CID: GSM Base Station CID Code (5 Byte)

RXLEV: GSM Signal

DDMMYY: Date & Time

vehicle_status: Car Status, please see the above 2 description.

#: Message End Symbol, 1 byte.

Platform upload LBS location command example:

***HQ,1400046168,NBR,160169,460,0,1,4,9338,3692,150,9338,3691,145,9338,3690,140, 9338,3692,139,180813,FFFFFBFF#**

11. Tracker Upload LBS Location to Platform Server to Get Location In Text Description (VI4 Command):

Platform send LBS location to server to get the location description in english text, the command is as follow:

***HQ,YYYYYYYYYY,VI4,MCC,MNC,TA,NUM,LAC,CID,RXLEV ,LAC2,CID2,RXLEV……en#**

Note: * : Message Head Symbol, 1 byte.

HQ: Fixed Command, HQ is GPS Tracker Using Command, CC is remote control command.2 byte.

, : Delimiter (separator character).

YYYYYYYYYY: Tracker ID number (Normally is the 10 digital of the IMEI number after remove the last 1 digital, or the last 10 digital of the serial number),10 byte.

VI4: Upload LBS to sever to get location in text description command, 3 bytes.

HHMMSS: Download command Time (Server time), 6 byte.

MCC: MCC Country Code (3 Byte)

MNC: MNC Network Code (3 Byte)

TA: GSM Delay Time

NUM: GSM Base Station Number, max is 6.

LAC: LAC Location Code(5 Byte)

CID: GSM Base Station CID Code (5 Byte)

RXLEV: GSM Signal

eh: Text language is english.

#: Message End Symbol, 1 byte.

Platform upload LBS to server to get location description command example:

***HQ,1400046168,VI4,460,0,1,4,9338,3692,150,9338,3691,145,9338,3690,140, 9338,3692,139, en#**

Platform reply message example(please refer 7):

***HQ,1400046168,I4,en,160188,10,1,26,00320038003600200058006900780069 0061006e006700200041007600650006e0075**

12. Platform Get Tracker Software Version (VER Command):

Platform send command to tracker to get the tracker software version, the command is as follow:

***HQ,YYYYYYYYYY,VER,HHMMSS#**

Note: * : Message Head Symbol, 1 byte.

HQ: Fixed Command, HQ is GPS Tracker Using Command, CC is remote control command.2 byte.

, : Delimiter (separator character).

YYYYYYYYYY: Tracker ID number (Normally is the 10 digital of the IMEI number after remove the last 1 digital, or the last 10 digital of the serial number),10 byte.

VER: Check software version command from the platform to tracker, 3 bytes.

HHMMSS: Download command Time (Server time), 6 byte.

#: Message End Symbol, 1 byte.

Platform check command example:

***HQ,1400046168,VER,160198#**

Tracker Reply example:

***HQ,1400046168,V4,VER,830_V2.0_2014.08.18_20.18.28,160198,160208,A,2234.3066,N,11351.6829,E,00.00,000,180814,FFFFFBFF#**

13. Platform Send Listen Command to Tracker (R8 Command):

Platform send listen command to tracker, the tracker will call the listen address number, after the calling is picked up, the tracker will enter listening & monitoring status, the tracker will not send back information, the command is as follow:

***HQ,YYYYYYYYYY,R8,HHMMSS,LISTEN_ADDRESS#**

Note: * : Message Head Symbol, 1 byte.

HQ: Fixed Command, HQ is GPS Tracker Using Command, CC is remote control command.2 byte.

, : Delimiter (separator character).

YYYYYYYYYY: Tracker ID number (Normally is the 10 digital of the IMEI number after remove the last 1 digital, or the last 10 digital of the serial number),10 byte.

R8: Listen command to tracker from platform, 2 bytes.

HHMMSS: Download command Time (Server time), 6 byte.

LISTEN_ADDRESS: The phone number is used to call back to listen.

#: Message End Symbol, 1 byte.

Platform send listen command example:

***HQ,1400046168,R8,160238,13987654321#**