GPS/GPRS Tracker Protocol
(V1.21 for NR024)

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The protocol is applied for our GPS vehicle tracker products.

It adopts UDP connection to connect Tracker and GPRS_SERVER，there are 2 types:

1. TRACKER transmits to GPRS_SERVER, message format is：Message head + message body,

GPRS_SERVER transmits to TRACKER，message format is：Message head + message body +message end signal

1. Message list

1.1Shake_hand Request

Tracker send to server, server will save the last IP and port of tracker, it will use the IP and Port while server send command to tracker;

CMD_ShakeHandReq 0x0000

No.	Field	TYPE	Length	description
1	packetLen	short	2	Length of packet
2	CMD	short	2	0x0000
3	sUserID	char	11	Device ID

Data sample:

0f 00 00 00 4e 52 30 39 47 30 32 34 38 32 00

Decode the data:

0f 00 nPackLen = 0x000f (15byte)

00 00 nFlag = 0x0000

4e 52 30 39 47 30 32 34 38 32 00 deviceID: (NR09G02482)

1.2Response of Shake hand

Tell the tracker that server has received the shake hand message

No.	Field	TYPE	Length	description
1	sMark	char	6	Flag of message (\r\n*KW\0)
2	packetLen	short	2	Message Length
3	CMD	short	2	0x8000

4	cErrorCode	char	1	Status=0x00
5	sEnd	char	2	message end "\r\n"

1.3 Upload position Message Request

Tracker will upload the position message pre interval second that user set ,the interval will be change to 10times when engine is off , For example:if the interval is 30s, tracker will upload the position data pre 30s while engine is on(ACC is ON) , it will upload the position data pre 300s when the engine is off(ACC is off)

No.	Field	TYPE	Length	description
1	packetLen	short	2	Message length
2	CMD	short	2	0x0008
3	bEnable	unsigned char	1	Status: 0bit is locating 1bit Main power ;2,3,4,5bit is NULL; 6bit ACC status ; 7bit poff
4	bAlarm	unsigned char	1	Default 0x80 SOS alarm:0x81 overSpeed alarm:0x82 geo_fence alarm :0x83 Main Power cut alarm:0x89 Pin8 alarm: 0x8f
5	nSpeed	char	1	Speed
6	nDirection	short	2	Direction angle
7	fLongitude	float	4	Longitude
8	fLatitude	float	4	Latitude
9	nDateTime	long	4	Date
10	sUserID	char	11	Device ID
11	nIOState	char	1	I/O status
12	nOilState	char	1	Value of Fuel

Tracker send to server data sample:

22 00 08 00 C3 80 00 77 00 23 E3 C8 42 0A DA 5C 41 CD 85 CA 34 4E 52 30 39 47 30 34 37 39 38 00 00 00

Decode the data one by one byte:

22 00 →nPackLen = 0x0022= 34byte

08 00 →commandID=0x0008

C3 → bEnable

80 →nAlarm

00 →nSpeed

---

77 00 →nDirection
24 03 58 40 -->Long = 3.37519
65 4B D0 40 -->lat = 6.50920
2E F5 F8 32 -->data and time=2012-11-28 15:20:46 (YYYY-MM-DD HH:MM:SS)
4E 52 30 39 47 30 34 37 39 38 00 →deviceID:NR09G04798
00 →nIO
00 →nOil
Note:

nDateTime has compress to 4BYTE (32bit)
26~31bit →Year
22~25bit→month
17~21bit→day
12~16bit→Hour
6~11bit →Minite
0~5bit →second

```
void GetTimestring(long nDateTime, char* sDateTime)
{
    long ndate = 0;
    ndate = nDateTime>>26;//year
    sDateTime[0] = ndate/10 +'0';
    sDateTime[1] = ndate%10 +'0';
    sDateTime[2] = '-';
    ndate =  nDateTime>>22&0x0f;//month
    sDateTime[3] = ndate/10 +'0';
    sDateTime[4] = ndate%10 +'0';
    sDateTime[5] = '-';
    ndate =  nDateTime>>17&0x1f;//day
    sDateTime[6] = ndate/10 +'0';
    sDateTime[7] = ndate%10 +'0';
    sDateTime[8] = ' ';

    ndate =  nDateTime>>12&0x1f;//hour
    sDateTime[9] = ndate/10 +'0';
    sDateTime[10] = ndate%10 +'0';
    sDateTime[11] = ':';
    ndate = nDateTime>>6&0x3f;//minute
    sDateTime[12] = ndate/10 +'0';
    sDateTime[13] = ndate%10 +'0';
    sDateTime[14] = ':';
    ndate =  nDateTime&0x3f;//second
    sDateTime[15] = ndate/10 +'0';
    sDateTime[16] = ndate%10 +'0';
    sDateTime[17] = 0;
```

}

1.4 Upload the alarm Message Request(Tracker→Server)

If the alarm has been trigger, it will upload alarm message to server,

No.	Field	TYPE	Length	description
1	packetLen	short	2	Message length
2	CMD	short	2	0x0003
1	bEnable	unsigned char	1	Status: 0bit is locating 1bit Main power ;2,3,4,5bit is NULL; 6bit ACC status ; 7bit poff
2	bAlarm	unsigned char	1	Default 0x80 SOS alarm:0x81 overSpeed alarm:0x82 geo_fence alarm :0x83 Main Power cut alarm:0x89 Pin8 alarm: 0x8f
3	nSpeed	char	1	Speed
4	nDirection	short	2	Direction angle
5	fLongitude	double	4	Longitude
6	fLatitude	double	4	Latitude
7	nDateTime	long	4	Date
8	sUserID	char	11	Device ID
9	nIOState	char	1	I/Ostatus
10	nOilState	char	1	Value of fuel

1.5 Control command by GPRS(server→tracker)

Server can sent command to tracker to get the realtime position , and server can send other command to set the other parameter by this command, you only modify the string of sData

No.	Field	TYPE	Length	description
1	sMark	char	6	Flag of message (\r\n*KW\0)
2	packetLen	short	2	Message Length
3	CMD	short	2	0x0002
4	nGisIp	int	4	GIS User client IP
5	nPort	short	2	GIS User client port

6	sData	Char	50	Appendix A
7	sEnd	char	2	message end "\r\n"

1.6 Response of control Message(Tracker→Server)

CMD_CommandResp 0x8009

No.	Field	TYPE	Length	description
1	packetLen	short	2	Message Length
2	CMD	short	2	0x8009
3	nGisIp	int	4	GIS User IP
4	nPort	Unsigned int	2	GIS User ID
5	bEnable	unsigned char	1	Status 0 is locating ; 1bit main power; 2,3,4,5bit NULL; 6bit ACC status; 7pOff
6	bAlarm	unsigned char	1	0x80;
7	nSpeed	char	1	Speed
8	nDirection	short	2	Direction angle
9	fLongitude	float	4	Longitude
10	fLatitude	float	4	Latitude
11	nDateTime	long	4	Date
12	sUserID	char	11	Device ID
13	nIOState	char	1	I/O status
14	nOilState	char	1	Value of fuel
15	cErrorCode	Char	1	>0 is OK,<0 is failed

1.7 Upload image request(Tracker→Server)

It will take a photo (JPG file) while server send command to take a photo or turn on the engine ,tracker will send a message to tell the server much the JPG file is,

No.	Field	TYPE	Length	Description
1	packetLen	short	2	Message Length
2	CMD	short	2	0x0200
3	sUserID	char	11	Device ID
4	nDate	long	4	date
5	nTime	long	4	time
6	nFileLen	unsigned short	2	Size of image (jpg file)

1.8 Response of upload image(Server→tracker)

No.	Field	TYPE	Length	description
1	sMark	char	6	Flag of message (\r\n*KW\0)
2	packetLen	short	2	Message Length
3	CMD	short	2	0x8200
4	cErrorCode	char	1	0x00→OK, 0x01→invalid deviceID
5	sEnd	char	2	message end "\r\n"

1.9 Packet of image (TRACKER→ GPRS_SERVER)

Tracker will upload the JPG file by small packet(506), because the packet is too large to limited by internet.

No.	Field	TYPE	Length	description
1	packetLen	short	2	Message Length
2	CMD	short	2	0x0200
3	sUserID	char	11	Device ID
4	nPage	unsigned short	2	Index of jpg file block
5	nPageLen	unsigned short	2	block length nPageLen<506, it means the last block
6	sData	char	506	Image data,

1.10 Response of upload image packet

CMD_SendJpgResp 0x8201

No.	Field	TYPE	Length	description
1	sMark	char	6	Flag of message (\r\n*KW\0)
2	packetLen	short	2	Message Length
3	CMD	short	2	0x8201
4	nPage	unsigned short	2	Index of jpg file block
5	cErrorCode	char	1	Status code
6	sEnd	char	2	message end "\r\n"

1.11 Tracker upload New Position request(Tracker→Server)

NR024 can be add temperature sensor, so we add a new message for the version

No.	Field	TYPE	Length	description
1	packetLen	short	2	Message length
2	CMD	short	2	0x0032
1	bEnable	unsigned char	1	Status: 0bit is locating 1bit Main power ;2,3,4,5bit is NULL; 6bit ACC status ; 7bit poff
2	bAlarm	unsigned char	1	Default 0x80 SOS alarm:0x81 overSpeed alarm:0x82 geo_fence alarm :0x83 Main Power cut alarm:0x89 Pin8 alarm: 0x8f
3	nSpeed	char	1	Speed
4	nDirection	short	2	Direction angle
5	fLongitude	float	4	Longitude
6	fLatitude	float	4	Latitude
7	nDateTime	long	4	Date
8	sUserID	char	11	Device ID
9	nIOState	char	1	I/Ostatus
10	nOilState	char	1	Value of fuel
11	nTempNum ;	short	2	tempareture
12	nDistance	float	4	Total mileage from engine is on

Position Upload message sample data

28 00 32 00 C3 80 00 26 00 24_03 58 40 65 4B D0 40 2E F5 F8

32 4E 52 30 39 47 30 35 31 30_30 00 00 00 19 00 A9 4A 47 49

Decode one by one byte

28 00 -->packet length=0x0028 = 40byte

32 00 -->commandID = 0x0032

C3 --> GPS FIX or not, Ignition status

80 -->is it alarm message

00 -->speed

26 00 -->angle

---

24 03 58 40 -->Long = 3.37519
65 4B D0 40 -->lat = 6.50920
2E F5 F8 32 -->data and time=2012-11-28 15:20:46 (YYYY-MM-DD HH:MM:SS)
4E 52 30 39 47 30 35 31 30 30 00 -->device ID:NR09G05100
00 -->IO status
00 -->fuel data
19 00 -->temperature
A9 4A 47 49 -->millege

1.12 Tracker upload RFID card request(Tracker→Server)

NR024 can be add temperature sensor, so we add a new message for the version

No.	Field	TYPE	Length	description
1	packetLen	short	2	Message length
2	CMD	short	2	0x0033
1	bEnable	unsigned char	1	Status: 0bit is locating 1bit Main power ;2,3,4,5bit is NULL; 6bit ACC status ; 7bit poff
2	bAlarm	unsigned char	1	Default 0x80
3	nSpeed	char	1	Speed
4	nDirection	short	2	Direction angle
5	fLongitude	float	4	Longitude
6	fLatitude	float	4	Latitude
7	nDateTime	long	4	Date
8	sUserID	char	11	Device ID
9	nIOState	char	1	I/Ostatus
10	nOilState	char	1	Value of fuel
11	RFID;	Char	11	RFID card number
12	nDistance	float	4	Total mileage from engine is on

Sample data:
31 00 33 00 83 80 00 C9 00 A5 36 9B 42EC A8 4E 41 5E 73 AA 34 4E 52 30 39 47 30 34 38 32 32 00 00 00 30 39 30 30 34 38 32 34 30 62 00 00 00 20 41

Decode :
31 00 nPackLen
33 00 nFlag
83 bEnable
80 nAlarm

---

00 nSpeed
C9 00 nDirection
A5 36 9B 42 //Log
EC A8 4E 41 //lat
5E 73 AA 34 //time
4E 52 30 39 47 30 34 38 32 32 00 //deviceID=NR09G04822
00
00
30 39 30 30 34 38 32 34 30 32 00 //ID card =0900482402
00 00 20 41 //ndistance

1.13 Tracker upload 4 Fuel request(Tracker→Server)

NR024 can be add temperature sensor, so we add a new message for the version

No.	Field	TYPE	Length	description
1	packetLen	short	2	Message length
2	CMD	short	2	0x0037
1	bEnable	unsigned char	1	Status: 0bit is locating 1bit Main power ;2,3,4,5bit is NULL; 6bit ACC status ; 7bit poff
2	bAlarm	unsigned char	1	Default 0x80 SOS alarm:0x81 overSpeed alarm:0x82 geo_fence alarm :0x83 Main Power cut alarm:0x89 Pin8 alarm: 0x8f
3	nSpeed	char	1	Speed
4	nDirection	short	2	Direction angle
5	fLongitude	double	4	Longitude
6	fLatitude	double	4	Latitude
7	nDateTime	long	4	Date
8	sUserID	char	11	Device ID
9	nIOState	char	1	I/Ostatus
10	nOilState	char	1	Value of fuel
11	nFuel2	short	2	Value of Fuel2(ultra fuel sensor,unit :mm)
12	nFuel3	short	2	Value of Fuel3
13	nFuel4	short	2	Value of Fuel4
11	nTempNum ;	short	2	tempareture
12	nDistance	float	4	Total mileage from engine is on

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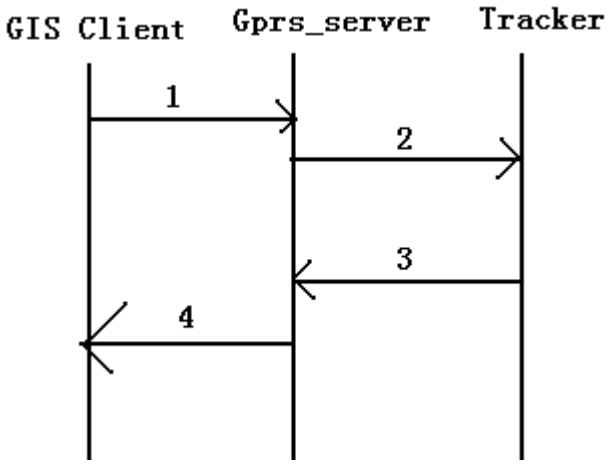
2. Appendix A



String format of field sData in Control command by GPRS(server→tracker) 0x0002

2.1. Get tracker position

sData[50] = *KW,DeviceID,000,082309#
Sample Date: *KW,NR09G00001,000,082309#
It is to get realtime position of NR09G00001

Server send to tracker to get the postion of the tracker

No.	Field	Sample data
1	sMark	\r\n*KW
2	packetLen	0x0044 =68
3	Command ID	0x0002
4	nGisIp	0
5	nPort	0
6	sData[50]	*KW,NR09G00001,001,082309#
7	sEnd[2]	\r\n”

2.2. Modify device password：

sData[50] = * KW, DeviceID,001, HHMMSS, ******,$$$$$$ #

******is old password（default is 000000）,$$$$$$ is new password

For example :*KW,NR09G00001,001,080756,000000,123456#
Change the password of tracker from 000000 to 123456

2.3. Real-time respond

sData[50] =*KW, 000,002, HHMMSS, interval #
interval =0 is stop ， interval=[30 ~ 65535 second]

2.4. Telphone set:

sData[50] =* KW, DeviceID,003, HHMMSS,P,TelNumber#
P=[1,3]
P=1 is telephone number for SOS
If the telNumber is 000, it cancel the telephone number
For example: *KW,NR09G00001,003,080765,1,13900000001#
Set the SOS telephone number is 13900000001
Cancel the SOS telephone number: *KW,NR09G00001,003,080765,1,000#

2.5. Control the engine ：

sData[50] =* KW, DeviceID,007, HHMMSS,X#
（X=0：close，X=1：open）
For example :Cut off the engine by GPRS :
*KW,NR09G00001,007,080756,0#

2.6. Set Over speed Alarm ：

sData[50] =* KW, DeviceID,005, HHMMSS ,XX#
XX is the speed
=00is close the over speed alarm function
=[01<XX<200] (10Km/H)
For example:*KW,NR09G00001,005,080765,80#
Set the vehicle speed limited 80KM/H

2.7. e-Fence Setting:

sData[50] =* KW, DeviceID,006, HHMMSS ,XX#
XX = [00,50] (unit :100m)
=00 is close e_Fence function

=01 100m
=02 200m
=03 300m
=04 400m
=05 500m
Example: **Set Distance (1100)M:**
*KW,NR09G00001,006,080765,11#

2.8. Restart device：

sData[50] =* KW, DeviceID,099,080756,RESETSYSTEM#
restart the NR09G00001 by GPRS :* KW, DeviceID,099,080756,RESETSYSTEM#

2.9. take a photo

sData[50] = *KW,Device ID,015,080756#
sample data:*KW,NR09G00001,015,080756#
tracker receive the command ,it will power on the camera and take photo, upload a JPG file to server,server will save the data as a binary file and extend file name is *.jpg

2.1. Set Server IP and Port:

sData[50] =*KW,Device ID,010,080756,IP,Port#
sample data: *KW,NR09B00001,010,080756,121.37.58.10,6900#
the tracker receive the message ,It will send the data to server 121.37.58.10, Port:6900