Frame Protocol of FrSky Telemetry Hub System

1. Frame Format

Header	DataID1	DATA1		Header	DataID2	DATA2		….	Tail
0x5E		Low	High	0x5E		Low	High	….	0x5E

The frame starts with 0x5E and ends with 0x5E，with byte-stuffing and data for different sensors separated by 0x5E.

G: Frames (see below) end in 0x5e but each packet within a frame does not

Note: DataID is a sign to identify the data following:

1. DATA Send Form is in Little Endian, except for latitude, longitude, date and time.

Latitude & longitude are separated by "." into 2 bytes
Date is separated in date month and year (DD/MM/YY)
Time is separated in hour minute and second (HH/MM/SS)

2. Byte stuffing method:

2.1 Output:
Byte in frame has value 0x5E is changed into 2 bytes: 0x5D 0x3E
Byte in frame has value 0x5D is changed into 2 bytes: 0x5D 0x3D
2.2 Input:
When byte 0x5D is received, discard this byte, and the next byte is XORed with 0x60.

2. Frame Send

Different data is sent in different time intervals. There are 3 types of frame: FRAME1 is sent per 200ms, FRAME2 is sent per 1s, and FRAME3 is sent per 5s.

Frame1

①Three-axis Acceleration Values, Altitude (variometer), Tempature1, Temprature2, Voltage, ②RPM
e.g:5e 24 00 04 5e 25 80 ff 5e 26 e0 fe 5e 10 3c 00 5e 02 ef ff 5e 05 e9 ff 5e 06 18 34 5e 03 63 00 5e

Note: the first 4 bit of the voltage data refers to battery cell number, while the last 12 bit refers to the voltage value. 0-2100 corresponding to 0-4.2V.
e.g:
.....0x5E 0x06 0x18 0x34 0x5E.....
0x06 refers to the voltage DataID
0x18 0x34
0001 1000 0011 0100
0001(1) means the first cell of pack, the last 12bit 0x834 (2100) means the value is 4.2V

① Real RPM value should be the RPM value in Frame1*60
② Real three-axis acceleration values should be the three-axis acceleration values in Frame1/1000

Frame2

Course, Latitude, Longitude, Speed, Altitude（GPS）, Fuel Level
e.g:5e 14 2c 00 5e 1c 03 00 5e 13 38 0c 5e 1b c9 06 5e 23 4e 00 5e 12 ef 2e 5e 1a 98 26 5e 22 45 00 5e 11 02 00 5e 19 93 00 5e 04 64 00 5e

Frame3

Date, Time
e.g: 5e 15 0f 07 5e 16 0b 00 5e 17 06 12 5e 18 32 00 5e
DATE: 15.07.2011
TIME: 06:18:50

3. DataID TABLE

DataID Value	Meaning	Unit(Form)	Range	Note
0x01	GPS altitude	m		Before”.”
0x01+8				After “.”
0x02	Temprature1	°C	-20-250	
0x03	RPM	RPM	0-60000	
0x04	Fuel Level	%	0, 25, 50, 75, 100	
0x05	Temprature2	°C	-20-250	
0x06	Volt	1/500 v	0-4.2v	
0x10	Altitude	m	0-9999	
0x11	GPS speed	Knots		Before “.”
0x11+8				After “.”
0x12	Longitude	dddmm.mmmm		Before “.”
0x12+8				After “.”
0x1A+8	E/W			
0x13	Latitude	ddmm.mmmm		Before “.”
0x13+8				After “.”
0x1B+8	N/S			
0x14	Course	degree	0-360	Before “.”
0x14+8				After “.”
0x15	Date/Month			
0x16	Year			
0x17	Hour /Minute			
0x18	Second			
0x24	Acc-x	1/256g	-8g ~ +8g	
0x25	Acc-y	1/256g	-8g ~ +8g	
0x26	Acc-z	1/256g	-8g ~ +8g	