

# Two-way system protocol

## 1. Aims

To help user develop his or her own program to fully make use of FrSky's two-way system.

## 2. Hardware defination

Telmetry Pins:

Port 1: 0~3.3V voltage, value: 0x00~0xff.

Port 2: 0~3.3V voltage, value: 0x00~0xff.

Port 3: RS232 RX pin.

Serial COM setting: 4800bps, 8bit, No parity, 1 stopping bit.

Rxin	5V	GND
AD1	3.3V	GND
AD0	3.3V	GND

### 2.1. host end

Serial COM setting: 4800bps, 8bit, No parity, 1 stopping bit.

Build in error free protocol, there is no need for error correction by user.

Rxin
Txout
+5V
GND

## 3. Frame protocol

### 3.1. Host end

- 11 bytes frame started and ended with 0x7E.
- Byte Stuffing:

Output

Byte has value 0x7E in frame is changed into 2 bytes: 0x7D 0x5E

Byte has value 0x7D in frame is changed into 2 bytes: 0x7D 0x5D

Input:

When byte 0x7D is received, discard this byte, and the next byte is XORed with 0x20;

3.1.1. Input for setting alarm threshold

Head1	Head2	Threshold Value	Greater 1:greater than 0: less than	Alarm level 0: greatest 1: middle 2: lowest	5 bytes 00	End Byte	Answered with
0x7E	0xFC	Analog 1	1/0			0x7E	The same frame
0x7E	0xFB	Analog 1	1/0			0x7E	The same frame
0x7E	0xFA	Analog 2	1/0			0x7E	The same frame
0x7E	0xF9	Analog 2	1/0			0x7E	The same frame

3.1.2. Input for request all available threshold setting

0x7E	0xF8	00	00	00	5bytes 00	0x7E	All threshold setting frames
------	------	----	----	----	--------------	------	------------------------------

3.1.3. Output for available alarm thresholds

head1	Head2	Threshold Value for	Greater 1:greater than 0: less than	Alarm level 0: greatest 1: middle 2: lowest	5 bytes 00	End Byte	
0x7E	0xFC	Analog 1	1/0			0x7E	
0x7E	0xFB	Analog 1	1/0			0x7E	
0x7E	0xFA	Analog 2	1/0			0x7E	
0x7E	0xF9	Analog 2	1/0			0x7E	

3.1.4. Output for remote voltage and link quality

Head1	Head2	Analog value for	Analog value for	Link quality	5 bytes 00	End Byte	
0x7E	0xFE	port 1	Port 2	Link quality		0x7E	

3.1.5. User data

Head1	Head2	Length of valid bytes in frame	Not used	User bytes	User bytes	End Byte	
0x7E	0xFD	Length of valid bytes	Not used	byte1	byte2 to byte6	0x7E	

## 3.2. Remote end

Just pure user bytes.