Communication protocol between LS3 Bluetooth and USB to UART

1. Command Table

ASCII Command	Hexadecimal code	Command function	Bluetooth	USB-UART
O+\r+\n+crc	4F 0D 0A 66	Power off	Yes	Yes
Z+\r+\n+crc	5A 0D 0A 71	Zero command	Yes	Yes
N+\r+\n+crc	4E 0D 0A 65	Unit switch to kN command	Yes	Yes
G+\r+\n+crc	47 0D 0A 5E	Unit switch to kgf command	Yes	Yes
B+\r+\n+crc	42 0D 0A 59	Unit switch to lbf command	Yes	Yes
S+\r+\n+crc	53 0D 0A 6A	Speed switch to SLOW(10Hz) command	Yes	Yes
F+\r+\n+crc	46 0D 0A 5D	Speed switch to FAST(40Hz) command	Yes	Yes
M+\r+\n+crc	4D 0D 0A 64	Speed switch to 640Hz command	No	Yes
Q+\r+\n+crc	51 0D 0A 68	Speed switch to 1280Hz command	No	Yes
L+\r+\n+crc	4C 0D 0A 63	Relative zero (zero) or absolute zero (net) mode switching command	Yes	Yes
X+\r+\n+crc	58 0D 0A 6F	Switch to relative zero mode command	Yes	Yes
Y+\r+\n+crc	59 0D 0A 70	Switch to absolute zero mode command	Yes	Yes
T+\r+\n+crc	54 0D 0A 6B	Set the current value as the absolute zero command	Yes	Yes
C+\r+\n+crc	43 0D 0A 5A	Peak clearing operation command	Yes	Yes
A+\r+\n+crc	41 0D 0A 58	Request PC or Bluetooth online command	Yes	Yes
E+\r+\n+crc	45 0D 0A 5C	Disconnect PC or Bluetooth online command	Yes	Yes
R+0+0+\r+\n+crc	52 30 30 0D 0A C9	Read the first log command	No	Yes
R+x+y+\r+\n+crc	52 3x 3y 0D 0A ??	Read the xyth log command(x≦9,y≦9)	No	Yes
R+9+9+\r+\n+crc	52 39 39 0D 0A DB	Read the 100th log command	No	Yes

Crc=Command+\r+\n

Example 1：4F 0D 0A 66，crc=4F+0D+0A=66

Example 2：52 30 30 0D 0A C9，crc=52 30 30 0D 0A=C9

2. Return data format

The length of data returned by each group is 20 bytes,Each group of data consists of 1-byte working mode + 6-byte measured value + 1-byte measured mode + 6-byte Reference zero value + 1-byte electric quantity value + 1-byte unit value + 1-byte speed value + 2-byte accumulated sum check value + end flag.
Example: return ASCII:R000.63Z-32.84RNS10 (Note: 0.63kN, relative zero measurement mode, 10Hz, power 100%, reference zero-32.84kN)
Its hexadecimal format is:52 30 30 30 2E 36 33 5A 2D 33 32 2E 38 34 52 4E 53 31 30 0D

Byte number	ASCII code	Hex code	Data description
1 Working mode	R	52	1 byte working mode code, meaning as follows R: Indicates that the work is in real-time mode O: Indicates that the test is overloaded C: Indicates the maximum capacity (default 3000 not received)
2~7 measured value	000.63	30 30 30 2E 36 33	6 byte measured value
8 measure mode	Z	5A	1 byte measurement mode, meaning as follows N: Represents the absolute zero measurement mode Z: Represents the relative zero measurement mode
9~14 Reference zero	-32.84	2D 33 32 2E 38 34	6 byte Reference zero value (in absolute zero measurement mode, this value is fixed to 0, and in relative zero measurement mode, this value is the reference zero value.)
15 electric quantity	Space~R	20~52	Hexadecimal 20 ~ 52, a total of 51 levels, so the power is 0%, 2%, 4%.... 96%, 98%, 100%
16 Unit value	N	4E	1 byte unit value, meaning as follows N: Indicates the unit of measurement is kN G: The unit of measurement is kgf B: Indicates that the unit of measurement is lbf

17 Speed value	S	53	1 byte speed value, meaning as follows S: Indicates that the speed is solw (10Hz) slow F: Indicates that the speed is fast (40Hz) M: Indicates that the speed is 640hz Q: Indicates that the speed is 1280hz
18~19 Check value	10	31 30	1-16 byte cumulative sum check value
20 end flag	\r	0D	1 byte end flag

Calculation method of 1-16 byte check code

52+30+30+30+2E+36+33+5A+2D+33+32+2E+38+34+52+4E+53=3F2

3F2 converts decimal system to 1010, and takes its lower two bits as check code, namely 10 (31, 30)