

## Input Modes Choosing

Toggle Switch State	Working Mode
1: OFF 2:OFF	UART
1: OFF 2:ON	PPM
1: ON 2:OFF	ANALOG
1: ON 2:ON	RESERVED

## System State Checking

In any working mode, the error light will be lighted up when errors like over-current condition, over-voltage condition, under-voltage condition, open-phase condition and MOS errors exist. You can check the type of the error through deciphering data strings returned by the controller under the UART Mode. The check list is below.

BIT	Error Description	BIT State
BIT15	-	-
BIT14	-	-
BIT13	-	-
BIT12	-	-
BIT11	-	-
BIT10	-	-
BIT9	open-phase condition	1
BIT8	over-current condition	1
BIT7	under-voltage condition	1
BIT6	over-voltage condition	1
BIT5	lower MOS of phase C broken	1
BIT4	upper MOS of phase C broken	1
BIT3	lower MOS of phase B broken	1
BIT2	upper MOS of phase B broken	1
BIT1	lower MOS of phase A broken	1
BIT0	upper MOS of phase A broken	1

## UART Mode

Address	Description	Function	Initial value	Memory Area
0(0x00)	---	Read	---	EEPROM
1(0x01)	---	Read	---	
2(0x02)	---	Read	---	
3(0x03)	Firmware version	Read	0x10	
4(0x04)	ID	Read/Write	0x01	
5(0x05)	baud rate	Read/Write	0x0a	
6(0x06)	PPM minimum high level width (L)	Read/Write	0xe8	
7(0x07)	PPM minimum high level width (H)	Read/Write	0x03	
8(0x08)	PPM maximum high level width (L)	Read/Write	0xd0	
9(0x09)	PPM maximum high level width (H)	Read/Write	0x07	
10(0x0a)	Input voltage lower limit	Read/Write	0x40	
11(0x0b)	Input voltage upper limit	Read/Write	0xf0	
12(0x0c)	Maximum current limit	Read/Write	0x32	
13(0x0d)	Acceleration	Read/Write	0x05	
14(0x0e)	Deceleration	Read/Write	0x05	
15(0x0f)	Command mode	Read/Write	0	
16(0x10)	---	---	---	
17(0x11)	---	---	---	
18(0x12)	---	---	---	
19(0x13)	---	---	---	
20(0x14)	Motor direction	Read/Write	0	RAM
21(0x15)	Target speed	Read/Write	0	
22(0x16)	Current voltage	Read	---	
23(0x17)	Current	Read	---	
24(0x18)	---	---	---	
25(0x19)	---	---	---	
26(0x1a)	---	---	---	
27(0x1b)	---	---	---	
28(0x1c)	---	---	---	
29(0x1d)	---	---	---	
30(0x1e)	---	---	---	
31(0x1f)	---	---	---	
32(0x20)	---	---	---	
33(0x21)	---	---	---	
34(0x22)	---	---	---	
35(0x23)	---	---	---	
36(0x24)	---	---	---	
37(0x25)	---	---	---	
38(0x26)	---	---	---	
39(0x27)	---	---	---	

## Explanation

1. ID: The maximum number of drivers working together in series is 254, and the address of broadcasting mode is 0x00.

2. Baudrate:

Value	Baudrate
1	1200
2	2400
3	4800
4	9600
5	14400
6	19200
7	28800
8	38400
9	57600
10	115200

3. PPM Mode: The range of PPM signal can be set as 1000us~2000us, 500us~2500us or any value between 500us~2500us, and the medium value stands for stop, for example, 1000us~1500us stands for clockwise rotation and 1500us~2000us stands for counter clockwise rotation.

4. Voltage parameter: The real voltage equals the value in the corresponding register divided by 8, for instance, the current value in the voltage register is 64(0x40), so the real voltage is 8V.

5. Current parameter: The real current equals the value in the corresponding register divided by 10, for instance, the current value in the voltage register is 50 (0x32), so the real current is 5A.

6. Acceleration/Deceleration: The value of the acceleration or the deceleration increases according to the value changing from 1 to 10 in the corresponding register.

7. Command mode: This mode can only be used in UART Mode, 0 stands for continuous mode while 1 stands for interrupted mode. In interrupted mode, continuous rotation of motors needs sending commands to the driver continuously, commands sending interval may vary according to the baudrate and the rotational speed in different situations. You can make practical tests according to situations to make sure that motors will not vibrate.

8. Motor Rotating Direction: 0 stands for clockwise rotation, 1 stands for counter clockwise rotation.

9. Target Speed: The range of control value is 0~255. (Speed closed-loop control included is not available in version one).

UART Controlling Byte:

Byte	Function
0x01	Ping: Check working state and bytes standing for the state will return
0x02	ReadData: Reading data from the controlling register.
0x03	WriteData: Writing data into the controlling register.
0x04	Reset: Resetting the register to factory default and the driver will be reset through software.
0x05	Restart: Resetting the driver through software (commonly used after parameters in EEPROM being set).

UART command packet style:

Head	Address	Length	Command	Parameter	XOR Check
0xff 0xff	ID	N+2	Command	Parameter1...ParameterN	Check

Check=0xff ^ 0xff ^ ID ^ (N+2) ^ Command ^ Parameter1 ^ ..... ^ ParameterN;

Common Command Example (Address 0x01):

1. Clockwise rotation of motors with the highest speed:

ff ff 01 05 03 14 00 ff ec

2. Counter clockwise rotation of motors with the highest speed:

ff ff 01 05 03 14 01 ff ed

3. Motors stop:

ff ff 01 05 03 14 00 00 13

4. Reading 4 bytes from RAM:

ff ff 01 04 02 14 04 17

5. Reading 13 bytes from EEPROM:

ff 01 04 02 03 0d 09

6. Checking state bit:

ff ff 01 02 01 02

7. Resetting through software:

ff ff 01 02 05 06

8. Resetting control register:

ff ff 01 02 04 07

9. Changing acceleration and deceleration:

ff ff 01 05 03 0d 0a 0a 0a

10. Changing maximum and minimum value of PPM:

ff ff 01 07 03 06 f4 01 c4 09 3b

11. Setting command mode as interrupted mode in UART mode:

ff ff 01 04 03 0f 01 08

(This Mode is not recommended when motors running in very high speed and be careful about modifying the frequency of commands sending in this mode)

12. Setting command mode as continuous mode in UART mode:

ff ff 01 04 03 0f 00 09

13. Setting the current address as 2 :

ff ff 00 04 03 04 02 01

PPM Mode:

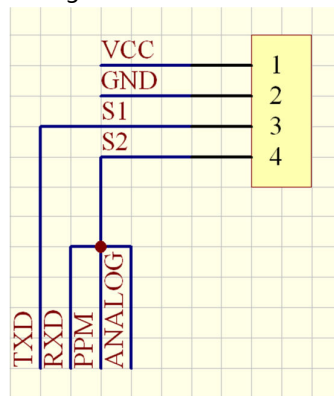
It is compatible with standard aero-model PPM interface, and you can also set the value of the width and the amplitude of the pulse signal yourself. Values between the minimum value and the medium value stand for clockwise rotation, and those between the medium value and the maximum value stand for counter-clockwise rotation, while the medium value stands for stop.

ANALOG Mode

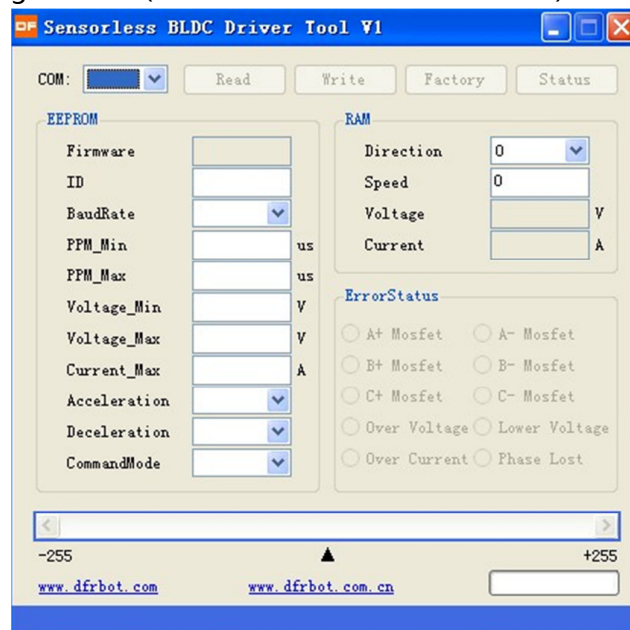
0~2.5V input stands for clockwise rotation, and 2.5~5V input stands for counter-clockwise rotation, while 2.5V stands for stop.

About S1/S2 port

For UART, PPM and ANALOG Mod, motors and the driver communicate with each other through port S1 and port S2. The ports are assigned as the table shown below:



Client-debugging software(Sensorless BLDC Driver Tool V1 )

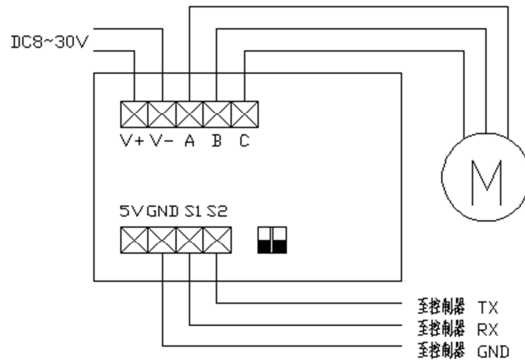


Factory : Set to factory default .

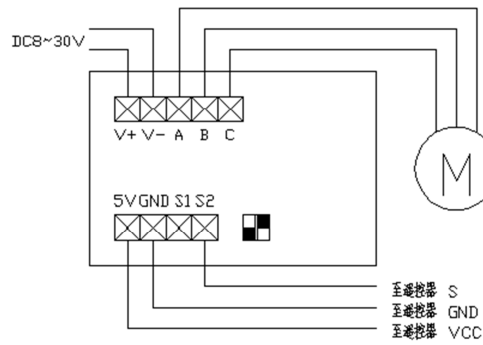
Status : Checking the detail information in error status.

Diagrams of 3 different input interfaces:

### 1. UART



### 2. PPM



### 3. ANALOG

