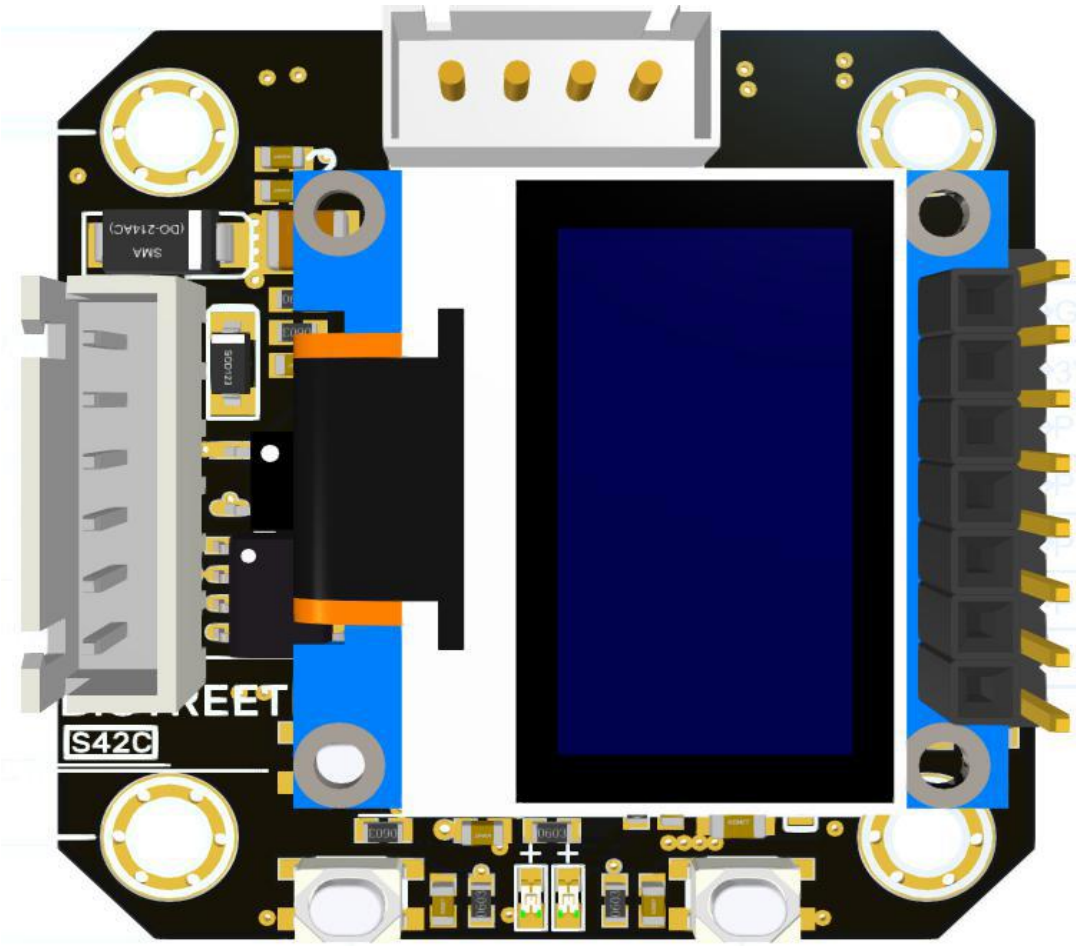
深圳市必趣科技有限公司

BIG TREE TECH

BIGTREETECH S42C User Manual

(Note: The manual is 3-in-1, different versions of S42C have different product lists!)



一、S42C Introduction

BIGTREETECH S42C is a closed-loop driver board to control the stepper motor. The main control is STM32G031G8U6 and the encoder is TLE5012B. With dual H-bridge drivers, S42C supports for Step mode and UART mode. To avoid pulse loss and increase by reflecting the rotation angle of the stepper motor to control board, comparing the distance to be rotated with actual rotation distance, calculating the error value and compensating. The driver board improves the motor performance, processing speed and printing precision. The main control chip is able to detect the pulse loss caused by long-time working and then compensate so that the printer can work normally.

二、Parameters

Motor power supply (VM):

Subdivision drive: 1, 2, 4, 8, 16, 32, 64, 128, 256

Maximum current: 1650 mA (12V)

No-load current: 620 mA (12V)

Step , Dir rising edge 40 ns

Encoder resolution: 14 bit

H-bridge output frequency: 22.8 khz

Maximum speed: 2000 rpm

Main control chip: STM32G031G8U6, Crotex-M0+, 64MHz main frequency

三、Features

1. S42C is sold by a complete set, no assembly or debugging, plug and play.

2. No pulse loss at high speed printing.

3. Low heat generation, high efficiency.

4. Easy to install and wire.

5. The motor running is more stable.

6. 0.96inch OLED screen, the parameters can be modified.

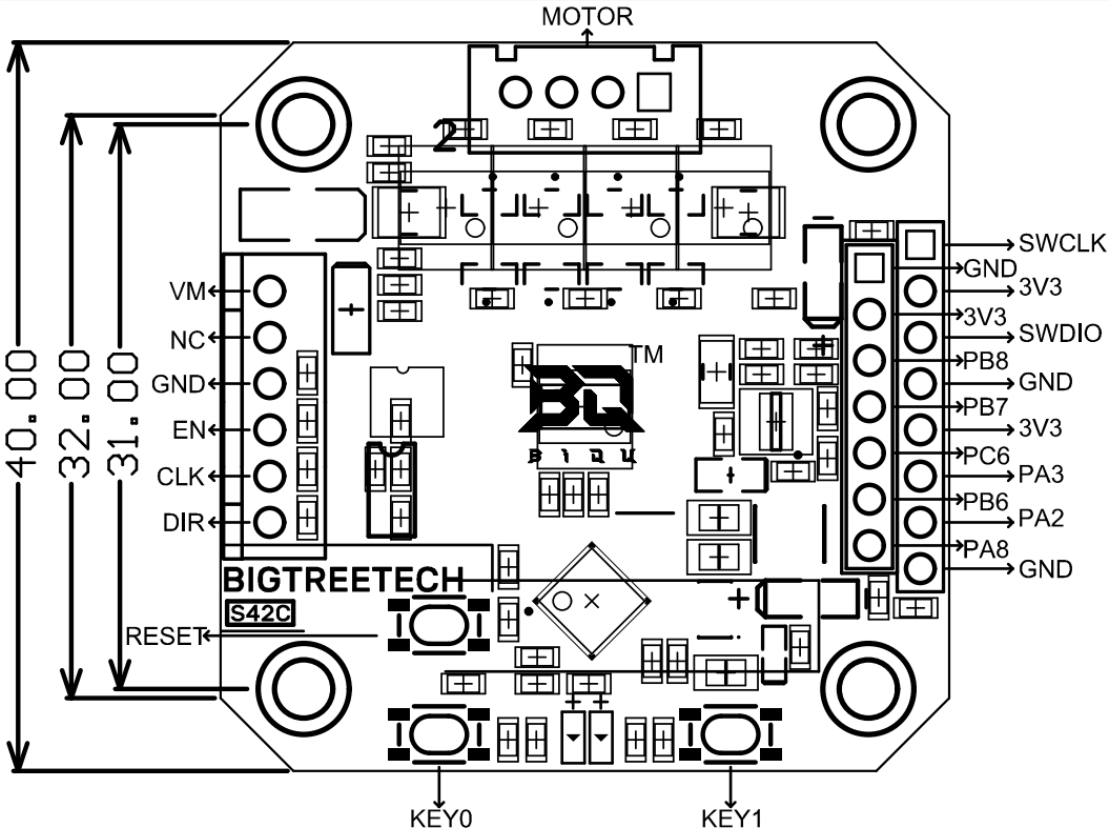
To realize the visualization of human-computer interaction, simple and convenient.

7. Software algorithm, low noise and low vibration.

8. Parameters setting can be saved for next loading.

9. Supports for UART mode direct control.

四、Size



五、Functions of buttons

	Short press	Long press
RESET	Reset	Reset
KEY0	UP	Confirm
KEY1	Down	Return

六、Parameters

OLED menu:

Home -- Home page

Sensor -- Sensor Information

Calibration -- Enter Press and confirm calibration

BaudRate -- UART baud rate selection

9600 19200 115200 256000

Current -- 4 level current

very high high medium low

Micro Step -- set subdivision

1 2 4 8 16 32 64 128 256

Direction -- Set Step mode direction

Inverted Normal

Enable Pin -- Set Step mode enable

Inverted Normal

Save Setting -- Saves the setting to Flash

About -- Version information

UART mode protocol format

UART protocol consists of synchronization bits, read/write bits, 8-bit register address and variable data.

Reads:

sync					data size			w/r	8bit register address						
0...4					5...7			8	9...15						
1	0	1	0	1	0	0	0	1	register address						
0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15

Read instruction: rw(bit 8) is 1 when reading the data of register address (bit 9-15).

Write:

sync					data size			w/r	8bit register address							data		
0...4					5...7			8	9...15							16...31		
1	0	1	0	1	0	1	0	0	register address							data bytes 3, 2, 1, 0 (high to low byte)		
0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	...	31

Write instruction: when rw(bit 8) is 0, write the register address (bit 9-15) with the data width defined by data size bits (5-6). The variable-length data can be received, for example, the data size is 2, and the data length is two bytes.

Note: The modified register needs to send the save instruction 0x18 before it can be written into Flash.

Address:

R/W	Addr	register	describe
W	0x01	Baud rate	0:9600 1:19200 2:115200 3:256000
W	0x02	Current value	0:low 1:medium 2:high 3:veryhigh
W	0x03	Micro step	1,2,4,6,8,16, 32,64,128,256
W	0x04	Direction	1:Inverted 0:Normal
W	0x05	Enable pin	1:Inverted 0:Normal
W	0x06	Step mode KP	0...1024
W	0x07	Step mode KI	0...1024
W	0x08	Step mode KV	0...1024
W	0x09	Step mode KD	0...1024
W	0x10	UART mode KP	0...1024
W	0x11	UART mode KD	0...1024
W	0x12	UART mode KI	0...1024
W	0x13	Set Moter mode	0x20:UART LocationMode 0x33:Step Mode
W	0x14	Set Stall switch	1:Enable 0:Disable
W	0x15	Set goal location	0x00...0xFFFFFFFF
W	0x17	Set disable	1:Disable 0:Enable
W	0x18	Save setting	--
R	0x81	Read baud rate	--
R	0x82	Read current	--
R	0x83	Read micro step	--
R	0x86	Read Step mode PID	--
R	0x90	Read UART mode PID	--
R	0x93	Read mode	--
R	0x94	Read stell proyect	--
R	0x95	Read location	--

七、Motherboard firmware configuration

The firmware of the motherboard only needs to configure the pulse number per millimeter to ensure that it is consistent with the microsteps set in S42C. S42C does not communicate with the motherboard through SPI or UART. Other configurations can be set according to A4988 STANDALONE mode.

Microsteps	Pulse number for full cycle (1.8° stepper)
1	200
2	400
4	800
8	1600
16	3200
32	6400
64	12800
128	25600
256	51200

八、Cautions:

1.Please ensure that the direction of the adapter plate is correct.Check the sequence of motor line and closed-loop link line.

2.For the first use, the closed-loop driver board must be connected to the motherboard with firmware, and then calibrate the encoder, please wait for 1-2 minutes.

3.Check if the driver is ready to be installed when connecting serial ports to computer.

4.When the data displayed on the screen or serial port is not normal, please remove the closed-loop driver board and check whether the magnet of the motor shaft is in the center. If it is not, please recalibrate. After calibration, set parameters after initialization(1-2s).

5.Do not turn the motor manually after power on.

6.The distance between the magnet of the motor shaft and the magnetic coding chip is more than 2mm.

7.Please ensure that the structure of 3D printer is stable.

Should you have any issues, please don't hesitate to contact us. We strive to provide you with the best quality products and services. If you have any good comments or suggestions, please feel free to share with us. Thank you for choosing BIGTREETECH products!