SHENZHEN BIQU TECHNOLOGY LIMITED COMPANY BIGTREETECH

BIGTREETECH MAX31865 V2.0

USER MANUAL

[Please read this manual carefully before use]

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URL:www.BIGTREE-TECH.com

This module uses MAX31865 chip, supports two-wire, three-wire, four-wire PT1000 and PT100 temperature sensors, adopts the same package of motor drive module, easy to install, and uses VCCIO part of the power supply. Support 3.3V-5V power input.



1,Pin Introduction

V_IN—Positive power supply (3.3V-5V)

GND—Power negative

SDI--data input

SDO--Data output

CLK--Clock line

CS--Chip Select

2, DIP Switch Configuration

1	2	3	4	Sensor Model
ON	ON	ON	OFF	Two lines PT100
ON	ON	OFF	ON	Two linesPT1000
OFF	ON	ON	OFF	Three lines PT100
OFF	ON	OFF	ON	Three lines PT1000
OFF	OFF	ON	OFF	Four-wire PT100
OFF	OFF	OFF	ON	Four-wire PT1000

When using a three-wire PT100 or PT1000 sensor, you need to short-circuit the two solder joints in the red box: (the factory default is a short-circuit between the middle and 24, and the use of a 3-wire requires a short-circuit between the middle and 3 and a short-circuit between 24)



Among them, the two-wire or 4-wire PT100/PT1000 is used to short the middle pad and the two sides close to the terminal block, and the 3-wire PT100/PT1000 is used to short the middle pad and the edge of the board. The factory default is 2/4 wires. 3 wires can also use 2 wires, but the accuracy is slightly reduced (same as 2 wires).

3,Connection of Module Installation Method



As shown in the figure above, modify the program of the motherboard, select the SPI mode of the motherboard driver jumper, and directly connect BIGTREETECH MAX31865V2.0 to the idle motor driver of the motherboard, and then connect the PT100/PT1000 thermistor to the corresponding original motor line On the interface (need to pay attention to the line sequence, subject to the actual motherboard, only support the motherboard that supports the SPI mode pluggable drive).

 $\Box_{\mathbf{x}}$ Installation Size:



Ξ , Marlin firmware configuration:

Marlin firmware supports the connection of up to two BTT PT1000&PT100 modules. The default is two-wire and four-wire common, through the configuration of Configuration.h and Configuration_adv.h files. The BTT PT1000&PT100 module can be a PT100 or PT1000 sensor, and different parameters need to be configured.

1, Configuration in Configuration.h:

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ial Help	• (Configuratio	on.h - marlin-gith	nub(test) - V	isual Studio C	ode [Adm	iinistra	tor]
	C Config	uration.h	• C pins_I	BTT_SKR_PI	RO_common	.h	G • Ma	arlin.inc
	Marlin >	C Config	uration.h >					
0 Ø	419 420	* >	Find		Aa Abi	* No res	sults	↑↓
	421	* 99	9 : Dummy T	able tha	at ALWAYS	reads 1	.00°C	or th
	422	*/						
	423	#define	TEMP_SENSO	R_0 -5				
	424	#define	TEMP_SENSO	R_1 -5				
	425	#detine	TEMP_SENSO	R_2 0				
	426	#define	TEMP_SENSO	R_3 0				
	427	#define	TEMP_SENSO	R_4 0				
	428	#define	TEMP_SENSO	R_5 0				
	429	#define	TEMP_SENSO	R_60				
	430	#define	TEMP_SENSO	R_7 0				
	431	#define	TEMP_SENSO	R_BED 1	•			
	432	#define	TEMP_SENSO	R_PROBE	0			
	433	#аетіпе	TEMP_SENSO	К_СНАМВЕ	:K Ø			
	454	// Dum	w thonmisto	n consta	nt tompon	atuno n	oodi	ngc -
	455	#define				ວ ເ	eaur	iigs, i
	430	#dofine	DUMMY THER	MISTOR_S	00 VALUE	2.5 1.00		
	438	nucrine				100		
	439	// Resi	stor values	when us	ing MAX31	865 sen	solis	(-5)
	440	#define	MAX31865 S	ENSOR OH	IMS 0	1000	1	(Ω) T
	441	#define	MAX31865 C	ALIBRATI	ON OHMS 0	4300	1	(Ω) T
	442	#define	MAX31865 S	ENSOR OH	IMS 1	100		
	443	#define	MAX31865_C	ALIBRATI	ON_OHMS_1	430		
	444							
м	445	// Use	temp sensor	1 as a	redundant	sensor	wit	h sens
	446	// from	the two se	nsors di	lffer too	much th	e pr	int w:
м	447	//#defi	ne TEMP_SEN	SOR_1_AS	S_REDUNDAN	Т		
	448	#define	MAX REDUND	ANT TEMP	SENSOR D	IFF 10		

TEMP_SENSOR_0 Set to -5: Use MAX31865 module on heater 0
TEMP_SENSOR_1 Set to -5: Use MAX31865 module on heater 1
Currently, only sensors 0 and 1 are configured as MAX31865 modules, others
are not supported

If using PT100:

MAX31865_SENSOR_OHMS Set to 100

MAX31865_CALIBRATION_OHMS Set to 430

If using **PT1000**:

MAX31865_SENSOR_OHMS Set to 1000

MAX31865_CALIBRATION_OHMS Set to 4300

In the picture above: Temperature sensor 0 is configured as a PT1000 MAX31865 module

Temperature sensor 1 is configured as a PT100 MAX31865 module The number of heating rods is 2 (#define EXTRUDERS 2)

2, Configuration in Configuration_adv.h:

```
#define THERMOCOUPLE_MAX_ERRORS20#define MAX_CONSECUTIVE_LOW_TEMPERATURE_ERROR_ALLOWED10#define SHOW_TEMP_ADC_VALUES#define M115_GEOMETRY_REPORT
```



3,Use BTT-SKR motherboard V1.1 V1.3 V1.4 BTT-SKR V1.4 turbo

BTT-SKR E3 Turbo When connecting the max31865 motherboard, the

firmware needs additional modification

Note: After steps 1, 2 are completed, compile the program, and the program will report an error as shown below

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EXPLORER ···	🔯 platformio.ini	G Adafruit_MAX31865.cpp	C Adafruit_MAX31865.h ×	C pins_BTT_S	ព្ល 🗉 …
> OPEN EDITORS	.pio > libdeps > LPC17(58 > Adafruit MAX31865 library > C	Adafruit_MAX31865.h >		
 > Orck EDIOS > MARLIN-GITHUB(GITHUB) > .github > .pio > build > libdeps > BIGTREE_GTR_V1_0 > BIGTREE_SKR_PRO > BIGTREE_SKR_PRO > .github > examples # .piopm G: Adafruit_MAX31865.hp 1 C Adafruit_MAX31865.h 2 Ø library.properties Ø README.md > STM32F103RC_btt > .vscode > /vsidtroot 	38 39 #define MAX 40 #define MAX 41 #define MAX 42 #define MAX 43 #define MAX 44 #define MAX 45 #define RTI 47 #define RTI 48 49 #if (ARDUIN 50 #include "// 51 #define 52 #include "// 53 #endif 54 55 typedef ent 56 MAX31865 57 MAX31865	<pre>(31865_FAULT_HIGHTHRESH 0x80 (31865_FAULT_LOWTHRESH 0x40 (31865_FAULT_LOWTHRESH 0x40 (31865_FAULT_REFINICM 0x20 (31865_FAULT_REFINICM 0x10 (31865_FAULT_ROTULOW 0x04 (31865_FAULT_OVUV 0x04 0_A 3.9083e-3 0_B -5.775e-7 10 >= 100) hrduino.h" #Program.h" #Pr</pre>	Adanul_WAA31665317 /		
<pre>> buildroot > bin > etc > share > tests > config > data > docker > docker > docs > Marlin > lib > but > DUTINE > TIMELINE bugfix=2.0x* ♀ ⊗ 15 △ 0 ♀ ✓</pre>	PROBLEMS 15 OUTF 52 #include "I ^~~ compilation termin *** [.pio\build\LPI In file included fi .pio\libdeps\LPC170 ************************************	ANT DEBUG CONSOLE TERMINAL AProgram.h" ated. 1768\lib4c7\Adafruit MAX31865 rom Marlin\src\module\temperatu 58\Adafruit MAX31865 libnary/Ad gram.h dependency? Check our li b lib search "header:WProgram.h Latformio.org/lib/search?query= efault	2: Task - Build library\Adafruit_MAX31865 ure.cpp:48: lafruit_MAX31865.h:52:10: f 	+ II cpp.o] Error 1 atal error: WP •8 LF C++ 1	Ê ∧ X rogram.h: Wim32 ₽ Ω

Make the following modifications in the file Adafruit_MAX31865.h Comment out (ARDUINO >= 100) to determine



BTT-SKR E3 TurboChange the Adafruit_MAX31865.h file under the LPC1769 file

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四、BIGTREETECH motherboard and BTT PT1000&PT100V module connection configuration:

The following is a tutorial for using the module on the BTT OCTOPUS

V1.0 motherboard (marlin firmware)

1, Use a 4-wire PT1000 sensor, E3 driver interface, select the SPI mode of

the driver to connect to MAX31865. The connection is shown in the figure



2,Add pins in the pin file

EXPLORER ····				😻 platformio.ini	C pins_BTT_OCTOPUS_V1_0.h ×	
> OPEN EDITORS	Marlin > src > pins > st	m32f4 > C pins_BTT_OC	TOPUS_V1_0.h ≻			
<pre>> ore controls > rampo > rampo > sam > sam > samd > samd > sanguino > stm32f0 > stm32f0 > stm32f4 C env_validate.h C pins_ANET_ET4.h C pins_ANET_ET4.h C pins_ANET_ET4.h</pre>	Mamm / StC / pm5 / 25 198 #define E2 200 #ifndef E2 201 #define E2 203 #endif 204 #define E 203 #endif 204 / #define 205 // #define 207 // #define 208 // #define 208 // #define 208 // #define 209 // #define 209 // #define 209 // #define 209 // #define 200 // #define 201 // #define 201 // #define 201 // #define 202 // #define 202 // #define 203 // #define 203 // #define 204 // #define 205 // #define 205 // #define 209 // #define 201 // #define 2	M32H Y C PINS_DIT_YC ENABLE_PIN CS_PIN 2_CS_PIN E3_STEP_PIN E3_DIR_PIN E3_ENABLE_PIN E3_CS_PIN e E3_CS_PIN	PE3 PD4 PE1 PE6 PA14 PE0 PD3			
C pins_ARMED.h C pins_BLACK_STM32F407VE.h C pins_BTT_BTT002_V1_0.h C pins_BTT_BTT02_V1_0.h C pins_BTT_GTR_V1_0.h C pins_BTT_GTR_V1_0.h C pins_BTT_STR_PR0_common.h	212 //Max31865 213 //Thermocou 214 //if the TE 215 #ifndef MAX 216 #define M 217 #define M 218 #define M 219 #define M	ple sensor MP_SENSOR value of 31865_CS_PIN MAX31865_MISO_PIN MAX31865_SCK_PIN MAX31865_MOSI_PIN MAX6675_S5_PIN	- 5 is enabled in the c PA6 PA5 PA7 PD3		it vill work	
C pins_BTT_SKR_PRO_V1_1.h C pins BTT SKR PRO_V1_2.h	220 //#define					
C pins_BTT_SKR_V2_0_common.h C pins_BTT_SKR_V2_0_REV_A.h C pins_BTT_SKR_V2_0_REV_B.h	222 222 223 // 224 // Temperat					
C pins_FLYF407ZG.h C pins_FYSETC_CHEETAH_V20.h	225 // 226 #define TEM 227 #if TEMP_SE	IP_BED_PIN INSOR_0 == 20				
C pins_FYSETC_S6_V2_0.h C pins_EVSETC_S6_h	228 #define T					
C pins_FYSETC_SPIDER.h	230 #dise 230 #define T 231 #endif					
C pins_LERDGE_S.h	232 #define TEM					
C pins_LERDGE_X.h	PROBLEMS OUTPUT	DEBUG CONSOLE TERM	linal			
ndef MAX31865_CS_PI	N					
define MAX31865_MIS	O_PIN		PA6			
define MAX31865_SCK	_PIN		PA5			
define MAX31865_MOS	I_PIN		PA7			
define MAX6675_SS_P	IN		PD3			
/#define MAX31865_C	S_PIN		PD3			

At present, to use this module on marlin, you need to define the

MAX31865 chip select as MAX6675_SS_PIN, compile the bin file,

and you can use it after updating

五、Precautions:

Please ensure that the power supply is disconnected when wiring or

dialing the DIP switch

Because this module uses SPI communication, motherboards that do

not support SPI mode pluggable drivers cannot be used directly.