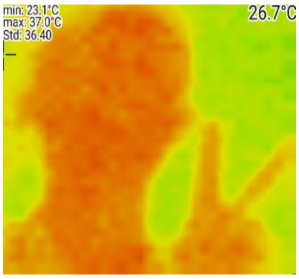

Hestia

Datasheet

A Low-Resolution Thermal Imaging Module

Latest Modified	Feb 14th, 2020
Version	V1.0_200213
Contributor	
Check	
Approver	

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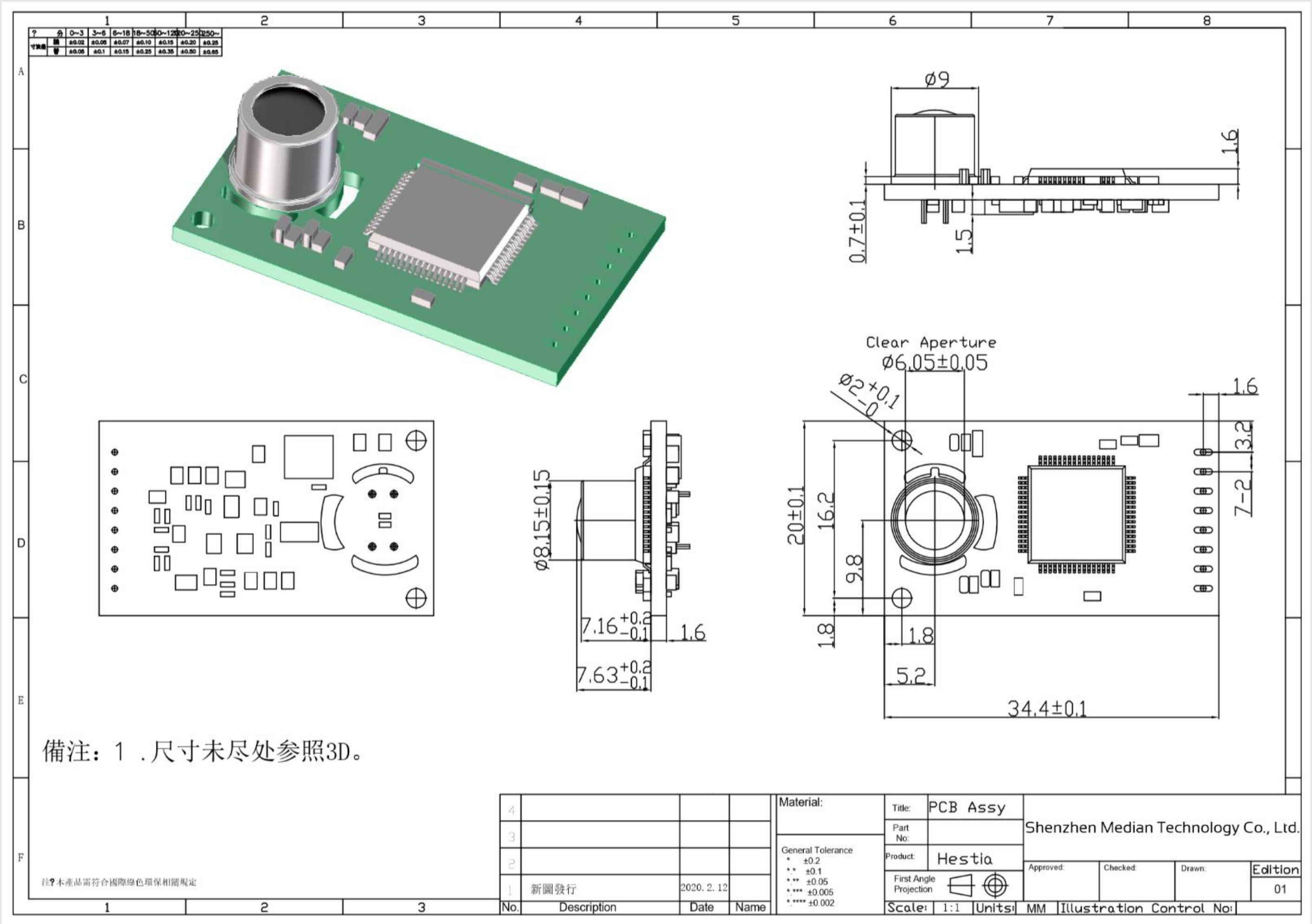
1. System Overview

Module	Sensor Type	Thermopile far-infrared sensor
	Available Spectrum	8~14um
	Resolution	32（H）x 32（V）
	Pixel Size	90um
	Maximum Frame Rate	7 FPS
	Typical Target Temp.	35~39℃
	Target Temp. Range	0~300℃
	Maximum Temp. Range	0~300℃
Environment	Working Environment Temp.	0~50℃
	Storage Environment Temp.	0~50℃
Interface	Power Supply	USB 5.0V（ ±10% ）
	Power Consumption	200mW（Typical）
	Signal Interface	USB/UART
	Output	RGB（Image）/Temp. Array
Layout	Size	34.4 x 20 x 10.1 (mm)
	FOV（Field Of View）	33°

2. Mechanical Specification


1
2
3
4
5
6
7
8
A
B
C
D
E
F
0~3
3~6
6~18
18~50
50~120
120~250
250~
±0.02
±0.05
±0.07
±0.10
±0.15
±0.20
±0.25
±0.05
±0.1
±0.15
±0.25
±0.35
±0.50
±0.65
Ø9
1.6
0.7±0.1
1.5
Clear Aperture
Ø6.05±0.05
Ø2 +0.1 −0
1.6
3.2
7-2
20±0.1
16.2
9.8
1.8
1.8
5.2
34.4±0.1
Ø8.15±0.15
7.16 +0.2 −0.1
1.6
7.63 +0.2 −0.1
備注：1 .尺寸未尽处参照3D。
注?本產品需符合國際綠色環保相關規定
4
3
2
1
新圖發行
2020. 2. 12
No.
Description
Date
Name
Material:
General Tolerance
. ±0.2
.. ±0.1
.** ±0.05
.*** ±0.005
.**** ±0.002
Title:
PCB Assy
Part No:
Product:
Hestia
First Angle Projection
Scale: 1:1
Units: MM
Illustration Control No:
Shenzhen Median Technology Co., Ltd.
Approved:
Checked:
Drawn:
Edition
01

3. Interface Description

3.1. UART/HUART Interface

Default Interface: UART

Baud rate: 115200

Data: 8bit Parity: none

Stop: 1bit Flow control: none

CMD List:

Output Command:

VCMD=$COMMAND {In Hex: 0x56434D443D_____}

Acknowledgement:

data [0A]

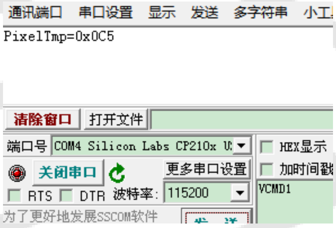
AMT (Ambient Temp.)	DAT (Temp. Array)	RES (Resolution)
TMP (Display Temp.)	VER (Firmware Version)	CFT (Continuous Frame Trans Before Compensation.)
OPW (Display Temp on Screen)	RXX (To get all pixels in row x)	CXX (To get all pixels in column x)
LFH (Point location of forehead)	FHT (get forehead temperature)	GYF (Get gray image within 8-bit)
BDHC (Border High Limit change)	BDLC (Border Low Limit change)	OHT (Outside high temp)
BDWH (Border Weight and Height setting)	IRT (IR Camera direction setting)	IRL (IR Camera direction setting)
DTB (Data Block)	IRR (IR Camera direction setting)	IRB (IR Camera direction setting)
OFFS (Point location of Forehead offset setting)	CENT (FHT Center Coordinate Setting)	

Notes：if you want to get the temperature of particular point, following method may work. All operations should be done during AMCAP working to watch the image normally, just to ensure temperature data available.

Command: *VCMD1*______ *to VCMD1024.*

Only 4 characters could be import after the *VCMD*. After “1” have 3 spaces and the display temperature data output at 10 times Celsius.

E.g.: If you want to get the temp. of the 123rd pixel, you can input *VCMD123_* and there is a space in the end. If you read the data correctly and translate it from Hex into Decimal, for example you get 368 finally, that means you get the point temperature 36.8℃.



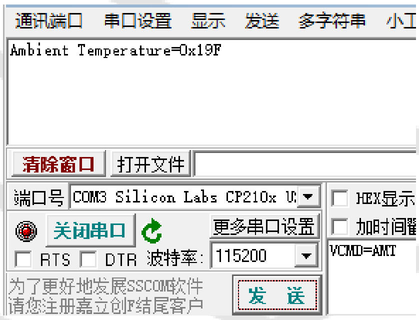
```
PixelTmp=0x0C5
```

端口号: COM4 Silicon Labs CP210x U

波特率: 115200

VCMD1

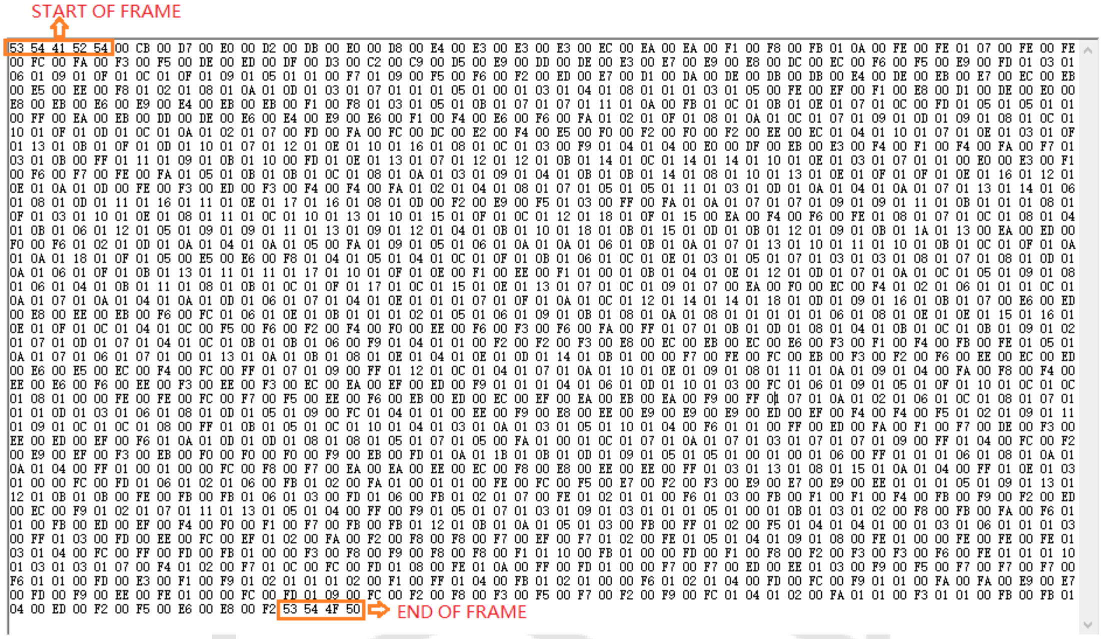
AMT: you can send this command if you want to get the Ambient Temp. The length of data you had received is 28 bytes, which head is *Ambient Temperature=* and Ambient Temp data is displayed in HEX.



```
Ambient Temperature=0x19F
```

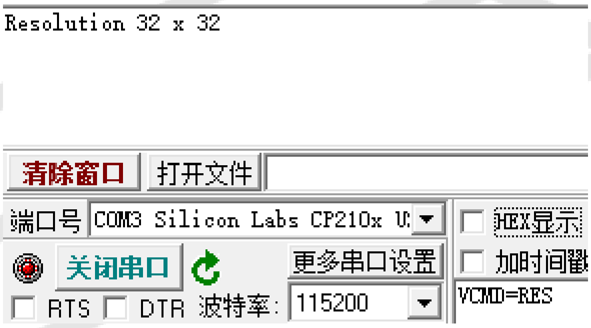
端口号 COM3 Silicon Labs CP210x U
波特率: 115200
VCMD=AMT

DAT: this function is used for output serial frames. In this model, you can get single frame of data after you send this command. All data is received in HEX. The header of frame is 53 54 41 52 54 and the end of frame is 53 54 4F 50. The length of the data receive is about 2057 bytes.



```
53 54 41 52 54 00 CB 00 D7 00 E0 00 D2 00 DB 00 E0 00 D8 00 E4 00 E3 00 E3 00 E3 00 EC 00 EA 00 EA 00 F1 00 F8 00 FB 01 0A 00 FE 00 FE 01 07 00 FE 00 FE
00 FC 00 FA 00 F3 00 F5 00 DE 00 ED 00 DF 00 D3 00 C2 00 C9 00 D5 00 E9 00 DD 00 DE 00 E3 00 E7 00 E9 00 E8 00 DC 00 EC 00 F6 00 F5 00 E9 00 FD 01 03 01
06 01 09 01 0F 01 0C 01 0F 01 09 01 05 01 01 00 F7 01 09 00 F5 00 F6 00 F2 00 ED 00 E7 00 D1 00 DA 00 DE 00 DB 00 DB 00 E4 00 DE 00 EB 00 E7 00 EC 00 EB
00 E5 00 EE 00 F8 01 02 01 08 01 0A 01 0D 01 03 01 07 01 01 01 05 01 00 01 03 01 04 01 08 01 01 01 03 01 05 00 FE 00 EF 00 F1 00 E8 00 D1 00 DE 00 E0 00
E8 00 EB 00 E6 00 E9 00 E4 00 EB 00 EB 00 F1 00 F8 01 03 01 05 01 0B 01 07 01 07 01 11 01 0A 00 FB 01 0C 01 0B 01 0E 01 07 01 0C 00 FD 01 05 01 05 01 01
00 FF 00 EA 00 EB 00 DD 00 DE 00 E6 00 E4 00 E9 00 E6 00 F1 00 F4 00 E6 00 F6 00 FA 01 02 01 0F 01 08 01 0A 01 0C 01 07 01 09 01 0D 01 09 01 08 01 0C 01
10 01 0F 01 0D 01 0C 01 0A 01 02 01 07 00 FD 00 FA 00 FC 00 DC 00 E2 00 F4 00 E5 00 F0 00 F2 00 F0 00 F2 00 EE 00 EC 01 04 01 10 01 07 01 0E 01 03 01 0F
01 13 01 0B 01 0F 01 0D 01 10 01 07 01 12 01 0E 01 10 01 16 01 08 01 0C 01 03 00 F9 01 04 01 04 00 E0 00 DF 00 EB 00 E3 00 F4 00 F1 00 F4 00 FA 00 F7 01
03 01 0B 00 FF 01 11 01 09 01 0B 01 10 00 FD 01 0E 01 13 01 07 01 12 01 12 01 0B 01 14 01 0C 01 14 01 14 01 10 01 0E 01 03 01 07 01 01 00 E0 00 E3 00 F1
00 F6 00 F7 00 FE 00 FA 01 05 01 0B 01 0B 01 0C 01 08 01 0A 01 03 01 09 01 04 01 0B 01 0B 01 14 01 08 01 10 01 13 01 0E 01 0F 01 0F 01 0E 01 16 01 12 01
0E 01 0A 01 0D 00 FE 00 F3 00 ED 00 F3 00 F4 00 F4 00 FA 01 02 01 04 01 08 01 07 01 05 01 05 01 11 01 03 01 0D 01 0A 01 04 01 0A 01 07 01 13 01 14 01 06
01 08 01 0D 01 11 01 16 01 11 01 0E 01 17 01 16 01 08 01 0D 00 F2 00 E9 00 F5 01 03 00 FF 00 FA 01 0A 01 07 01 07 01 09 01 09 01 11 01 0B 01 01 01 08 01
0F 01 03 01 10 01 0E 01 08 01 11 01 0C 01 10 01 13 01 10 01 15 01 0F 01 0C 01 12 01 18 01 0F 01 15 00 EA 00 F4 00 F6 00 FE 01 08 01 07 01 0C 01 08 01 04
01 0B 01 06 01 12 01 05 01 09 01 09 01 11 01 13 01 09 01 12 01 04 01 0B 01 10 01 18 01 0B 01 15 01 0D 01 0B 01 12 01 09 01 0B 01 1A 01 13 00 EA 00 ED 00
F0 00 F6 01 02 01 0D 01 0A 01 04 01 0A 01 05 00 FA 01 09 01 05 01 06 01 0A 01 0A 01 06 01 0B 01 0A 01 07 01 13 01 10 01 11 01 10 01 0B 01 0C 01 0F 01 0A
01 0A 01 18 01 0F 01 05 00 E5 00 E6 00 F8 01 04 01 05 01 04 01 0C 01 0F 01 0B 01 06 01 0C 01 0E 01 03 01 05 01 07 01 03 01 03 01 08 01 07 01 08 01 0D 01
0A 01 06 01 0F 01 0B 01 13 01 11 01 11 01 17 01 10 01 0F 01 0E 00 F1 00 EE 00 F1 01 00 01 0B 01 04 01 0E 01 12 01 0D 01 07 01 0A 01 0C 01 05 01 09 01 08
01 06 01 04 01 0B 01 11 01 08 01 0B 01 0C 01 0F 01 17 01 0C 01 15 01 0E 01 13 01 07 01 0C 01 09 01 07 00 EA 00 F0 00 EC 00 F4 01 02 01 06 01 01 01 0C 01
0A 01 07 01 0A 01 04 01 0A 01 0D 01 06 01 07 01 04 01 0E 01 01 01 07 01 0F 01 0A 01 0C 01 12 01 14 01 14 01 18 01 0D 01 09 01 16 01 0B 01 07 00 E6 00 ED
00 E8 00 EE 00 EB 00 F6 00 FC 01 06 01 0E 01 0B 01 01 01 02 01 05 01 06 01 09 01 0B 01 08 01 0A 01 08 01 01 01 01 01 06 01 08 01 0E 01 0E 01 15 01 16 01
0E 01 0F 01 0C 01 04 01 0C 00 F5 00 F6 00 F2 00 F4 00 F0 00 EE 00 F6 00 F3 00 F6 00 FA 00 FF 01 07 01 0B 01 0D 01 08 01 04 01 0B 01 0C 01 0B 01 09 01 02
01 07 01 0D 01 07 01 04 01 0C 01 0B 01 0B 01 06 00 F9 01 04 01 01 00 F2 00 F2 00 F3 00 E8 00 EC 00 EB 00 EC 00 E6 00 F3 00 F1 00 F4 00 FB 00 FE 01 05 01
0A 01 07 01 06 01 07 01 00 01 13 01 0A 01 0B 01 08 01 0E 01 04 01 0E 01 0D 01 14 01 0B 01 00 00 F7 00 FE 00 FC 00 EB 00 F3 00 F2 00 F6 00 EE 00 EC 00 ED
00 E6 00 E5 00 EC 00 F4 00 FC 00 FF 01 07 01 09 00 FF 01 12 01 0C 01 04 01 07 01 0A 01 10 01 0E 01 09 01 08 01 11 01 0A 01 09 01 04 00 FA 00 F8 00 F4 00
EE 00 E6 00 F6 00 EE 00 F3 00 EE 00 F3 00 EC 00 EA 00 EF 00 ED 00 F9 01 01 01 04 01 06 01 0D 01 10 01 03 00 FC 01 06 01 09 01 05 01 0F 01 10 01 0C 01 0C
01 08 01 00 00 FE 00 FE 00 FC 00 F7 00 F5 00 EE 00 F6 00 EB 00 ED 00 EC 00 EF 00 EA 00 EB 00 EA 00 F9 00 FF 01 07 01 0A 01 02 01 06 01 0C 01 08 01 07 01
01 01 0D 01 03 01 06 01 08 01 0D 01 05 01 09 00 FC 01 04 01 01 00 EE 00 F9 00 E8 00 EE 00 E9 00 E9 00 E9 00 ED 00 EF 00 F4 00 F4 00 F5 01 02 01 09 01 11
01 09 01 0C 01 0C 01 08 00 FF 01 0B 01 05 01 0C 01 10 01 04 01 03 01 0A 01 03 01 05 01 10 01 04 00 F6 01 01 00 FF 00 ED 00 FA 00 F1 00 F7 00 DE 00 F3 00
EE 00 ED 00 EF 00 F6 01 0A 01 0D 01 0D 01 08 01 08 01 05 01 07 01 05 00 FA 01 00 01 0C 01 07 01 0A 01 07 01 03 01 07 01 07 01 09 00 FF 01 04 00 FC 00 F2
00 E9 00 EF 00 F3 00 EB 00 F0 00 F0 00 F0 00 F9 00 EB 00 FD 01 0A 01 1B 01 0B 01 0D 01 09 01 05 01 05 01 00 01 00 01 06 00 FF 01 01 01 06 01 08 01 0A 01
0A 01 04 00 FF 01 00 01 00 00 FC 00 F8 00 F7 00 EA 00 EA 00 EE 00 EC 00 F8 00 E8 00 EE 00 EE 00 FF 01 03 01 13 01 08 01 15 01 0A 01 04 00 FF 01 0E 01 03
01 00 00 FC 00 FD 01 06 01 02 01 06 00 FB 01 02 00 FA 01 00 01 01 00 FE 00 FC 00 F5 00 E7 00 F2 00 F3 00 E9 00 E7 00 E9 00 EE 01 01 01 05 01 09 01 13 01
12 01 0B 01 0B 00 FE 00 FB 00 FB 01 06 01 03 00 FD 01 06 00 FB 01 02 01 07 00 FE 01 02 01 01 00 F6 01 03 00 FB 00 F1 00 F1 00 F4 00 FB 00 F9 00 F2 00 ED
00 EC 00 F9 01 02 01 07 01 11 01 13 01 05 01 04 00 FF 00 F9 01 05 01 07 01 03 01 09 01 03 01 01 01 05 01 00 01 0B 01 03 01 02 00 F8 00 FB 00 FA 00 F6 01
01 00 FB 00 ED 00 EF 00 F4 00 F0 00 F1 00 F7 00 FB 00 FB 01 12 01 0B 01 0A 01 05 01 03 00 FB 00 FF 01 02 00 F5 01 04 01 04 01 00 01 03 01 06 01 01 01 03
00 FF 01 03 00 FD 00 EE 00 FC 00 EF 01 02 00 FA 00 F2 00 F8 00 F8 00 F7 00 EF 00 F7 01 02 00 FE 01 05 01 04 01 09 01 08 00 FE 01 00 00 FE 00 FE 00 FE 01
03 01 04 00 FC 00 FF 00 FD 00 FB 01 00 00 F3 00 F8 00 F9 00 F8 00 F8 00 F1 01 10 00 FB 01 00 00 FD 00 F1 00 F8 00 F2 00 F3 00 F3 00 F6 00 FE 01 01 01 10
01 03 01 03 01 07 00 F4 01 02 00 F7 01 0C 00 FC 00 FD 01 08 00 FE 01 0A 00 FF 00 FD 01 00 00 F7 00 F7 00 ED 00 EE 01 03 00 F9 00 F5 00 F7 00 F7 00 F7 00
F6 01 01 00 FD 00 E3 00 F1 00 F9 01 02 01 01 01 02 00 F1 00 FF 01 04 00 FB 01 02 01 00 00 F6 01 02 01 04 00 FD 00 FC 00 F9 01 01 00 FA 00 FA 00 E9 00 E7
00 FD 00 F9 00 EE 00 FE 01 00 00 FC 00 FD 01 09 00 FC 00 F2 00 F8 00 F3 00 F5 00 F7 00 F2 00 F9 00 FC 01 04 01 02 00 FA 01 01 00 F3 01 01 00 FB 00 FB 01
04 00 ED 00 F2 00 F5 00 E6 00 E8 00 F2 53 54 4F 50
```

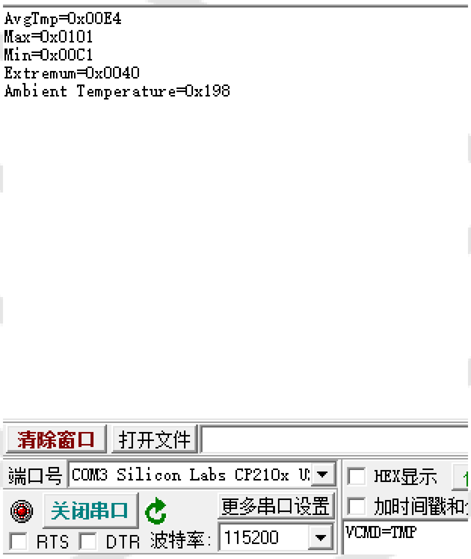
RES: return Hestia's sensor resolution. Length of data: 21 bytes



```
Resolution 32 x 32
```

端口号 COM3 Silicon Labs CP210x U
波特率: 115200
VCMD=RES

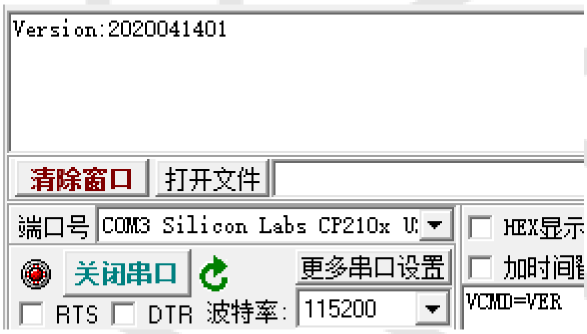
TMP: the function is for user to get Length of data: 88 bytes



```
AvgTmp=0x00E4
Max=0x0101
Min=0x00C1
Extremum=0x0040
Ambient Temperature=0x198
```

VCMD=TMP

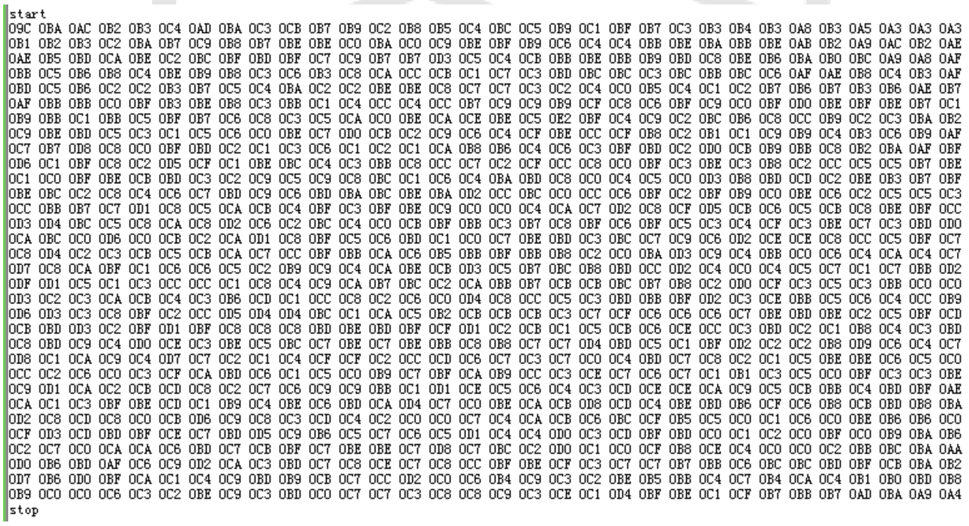
VER: get firmware version of Hestia Length of data 21 bytes



```
Version:2020041401
```

VCMD=VER

CFT: this function is used for output serial frames. In this model, you can get about 6 frames of data per second and not need to send commands continuously. All data is received in HEX. The header of frame is 53 54 41 52 54 and the end of frame is 53 54 4F



```
start
09C 0BA 0AC 0B2 0B3 0C4 0AD 0BA 0C3 0CB 0B7 0B9 0C2 0B8 0B5 0C4 0BC 0C5 0B9 0C1 0BF 0B7 0C3 0B3 0B4 0B3 0A8 0B3 0A5 0A3 0A3 0A3
0B1 0B2 0B3 0C2 0BA 0B7 0C9 0B8 0B7 0BE 0BE 0C0 0BA 0C0 0C9 0BE 0BF 0B9 0C6 0C4 0C4 0BB 0BE 0BA 0BB 0BE 0AB 0B2 0A9 0AC 0B2 0AE
0AE 0B5 0BD 0CA 0BE 0C2 0BC 0BF 0BD 0BF 0C7 0C9 0B7 0B7 0D3 0C5 0C4 0CB 0BB 0BE 0BB 0B9 0BD 0C8 0BE 0B6 0BA 0B0 0BC 0A9 0A8 0AF
0BB 0C5 0B6 0B8 0C4 0BE 0B9 0B8 0C3 0C6 0B3 0C8 0CA 0CC 0CB 0C1 0C7 0C3 0BD 0BC 0BC 0C3 0BC 0BB 0BC 0C6 0AF 0AE 0B8 0C4 0B3 0AF
0BD 0C5 0B6 0C2 0C2 0B3 0B7 0C5 0C4 0BA 0C2 0C2 0BE 0BE 0C8 0C7 0C7 0C3 0C2 0C4 0C0 0B5 0C4 0C1 0C2 0B7 0B6 0B7 0B3 0B6 0AE 0B7
0AF 0BB 0BB 0C0 0BF 0B3 0BE 0B8 0C3 0BB 0C1 0C4 0CC 0C4 0CC 0B7 0C9 0C9 0B9 0CF 0C8 0C6 0BF 0C9 0C0 0BF 0D0 0BE 0BF 0BE 0B7 0C1
0B9 0BB 0C1 0BB 0C5 0BF 0B7 0C6 0C8 0C3 0C5 0CA 0C0 0BE 0CA 0CE 0BE 0C5 0E2 0BF 0C4 0C9 0C2 0BC 0B6 0C8 0CC 0B9 0C2 0C3 0BA 0B2
0C9 0BE 0BD 0C5 0C3 0C1 0C5 0C6 0C0 0BE 0C7 0D0 0CB 0C2 0C9 0C6 0C4 0CF 0BE 0CC 0CF 0B8 0C2 0B1 0C1 0C9 0B9 0C4 0B3 0C6 0B9 0AF
0C7 0B7 0D8 0C8 0C0 0BF 0BD 0C2 0C1 0C3 0C6 0C1 0C2 0C1 0CA 0B8 0B6 0C4 0C6 0C3 0BF 0BD 0C2 0D0 0CB 0B9 0BB 0C8 0B2 0BA 0AF 0BF
0D6 0C1 0BF 0C8 0C2 0D5 0CF 0C1 0BE 0BC 0C4 0C3 0BB 0C8 0CC 0C7 0C2 0CF 0CC 0C8 0C0 0BF 0C3 0BE 0C3 0B8 0C2 0CC 0C5 0C5 0B7 0BE
0C1 0C0 0BF 0BE 0CB 0BD 0C3 0C2 0C9 0C5 0C9 0C8 0BC 0C1 0C6 0C4 0BA 0BD 0C8 0C0 0C4 0C5 0C0 0D3 0B8 0BD 0CD 0C2 0BE 0B3 0B7 0BF
0BE 0BC 0C2 0C8 0C4 0C6 0C7 0BD 0C9 0C6 0BD 0BA 0BC 0BE 0BA 0D2 0CC 0BC 0C0 0CC 0C6 0BF 0C2 0BF 0B9 0C0 0BE 0C6 0C2 0C5 0C5 0C3
0CC 0BB 0B7 0C7 0D1 0C8 0C5 0CA 0CB 0C4 0BF 0C3 0BF 0BE 0C9 0C0 0C0 0C4 0CA 0C7 0D2 0C8 0CF 0D5 0CB 0C6 0C5 0CB 0C8 0BE 0BF 0CC
0D3 0D4 0BC 0C5 0C8 0CA 0C8 0D2 0C6 0C2 0BC 0C4 0C0 0CB 0BF 0BB 0C3 0B7 0C8 0BF 0C6 0BF 0C5 0C3 0C4 0CF 0C3 0BE 0C7 0C3 0BD 0D0
0CA 0BC 0C0 0D6 0C0 0CB 0C2 0CA 0D1 0C8 0BF 0C5 0C6 0BD 0C1 0C0 0C7 0BE 0BD 0C3 0BC 0C7 0C9 0C6 0D2 0CE 0CE 0C8 0CC 0C5 0BF 0C7
0C8 0D4 0C2 0C3 0CB 0C5 0CB 0CA 0C7 0CC 0BF 0BB 0CA 0C6 0B5 0BB 0BF 0BB 0B8 0C2 0C0 0BA 0D3 0C9 0C4 0BB 0C0 0C6 0C4 0CA 0C4 0C7
0D7 0C8 0CA 0BF 0C1 0C6 0C6 0C5 0C2 0B9 0C9 0C4 0CA 0BE 0CB 0D3 0C5 0B7 0BC 0B8 0BD 0CC 0D2 0C4 0C0 0C4 0C5 0C7 0C1 0C7 0BB 0D2
0DF 0D1 0C5 0C1 0C3 0CC 0CC 0C1 0C8 0C4 0C9 0CA 0B7 0BC 0C2 0CA 0BB 0B7 0CB 0CB 0BC 0B7 0B8 0C2 0D0 0CF 0C3 0C5 0C3 0BB 0C0 0C0
0D3 0C2 0C3 0CA 0CB 0C4 0C3 0B6 0CD 0C1 0CC 0C8 0C2 0C6 0C0 0D4 0C8 0CC 0C5 0C3 0BD 0BB 0BF 0D2 0C3 0CE 0BB 0C5 0C6 0C4 0CC 0B9
0D6 0D3 0C3 0C8 0BF 0C2 0CC 0D5 0D4 0D4 0BC 0C1 0CA 0C5 0B2 0CB 0CB 0CB 0C3 0C7 0CF 0C6 0C6 0C6 0C7 0BE 0BD 0BE 0C2 0C5 0BF 0CD
0CB 0BD 0D3 0C2 0BF 0D1 0BF 0C8 0C8 0C8 0BD 0BE 0BD 0BF 0CF 0D1 0C2 0CB 0C1 0C5 0CB 0C6 0CE 0CC 0C3 0BD 0C2 0C1 0B8 0C4 0C3 0BD
0C8 0BD 0C9 0C4 0D0 0CE 0C3 0BE 0C5 0BC 0C7 0BE 0C7 0BE 0BB 0C8 0B8 0C7 0C7 0D4 0BD 0C5 0C1 0BF 0D2 0C2 0C2 0B8 0D9 0C6 0C4 0C7
0D8 0C1 0CA 0C9 0C4 0D7 0C7 0C2 0C1 0C4 0CF 0CF 0C2 0CC 0CD 0C6 0C7 0C3 0C7 0C0 0C4 0BD 0C7 0C8 0C2 0C1 0C5 0BE 0BE 0C6 0C5 0C0
0CC 0C2 0C6 0C0 0C3 0CF 0CA 0BD 0C6 0C1 0C5 0C0 0B9 0C7 0BF 0CA 0B9 0CC 0C3 0CE 0C7 0C6 0C7 0C1 0B1 0C3 0C5 0C0 0BF 0C3 0C3 0BE
0C9 0D1 0CA 0C2 0CB 0CD 0C8 0C2 0C7 0C6 0C9 0C9 0BB 0C1 0D1 0CE 0C5 0C6 0C4 0C3 0CD 0CE 0CE 0CA 0C9 0C5 0CB 0BB 0C4 0BD 0BF 0AE
0CA 0C1 0C3 0BF 0BE 0CD 0C1 0B9 0C4 0BE 0C6 0BD 0CA 0D4 0C7 0C0 0BE 0CA 0CB 0D8 0CD 0C4 0BE 0BD 0B6 0CF 0C6 0B8 0CB 0BD 0B8 0BA
0D2 0C8 0CD 0C8 0C0 0CB 0D6 0C9 0C8 0C3 0CD 0C4 0C2 0C0 0C0 0C7 0C4 0CA 0CB 0C6 0BC 0CF 0B5 0C5 0C0 0C1 0C6 0C0 0BE 0B6 0B6 0C0
0CF 0D3 0CD 0BD 0BF 0CE 0C7 0BD 0D5 0C9 0B6 0C5 0C7 0C6 0C5 0D1 0C4 0C4 0D0 0C3 0CD 0BF 0BD 0C0 0C1 0C2 0C0 0BF 0C0 0B9 0BA 0B6
0C2 0C7 0C0 0CA 0CA 0C6 0BD 0C7 0CB 0BF 0C7 0BE 0BE 0C7 0D8 0C7 0BC 0C2 0D0 0C1 0C0 0CF 0B8 0CE 0C4 0C0 0C0 0C2 0BB 0BC 0BA 0AA
0D0 0B6 0BD 0AF 0C6 0C9 0D2 0CA 0C3 0BD 0C7 0C8 0CE 0C7 0C8 0CC 0BF 0BE 0CF 0C3 0C7 0C7 0B7 0BB 0C6 0BC 0BC 0BD 0BF 0CB 0BA 0B2
0D7 0B6 0D0 0BF 0CA 0C1 0C4 0C9 0BD 0B9 0CB 0C7 0CC 0D2 0C0 0C6 0B4 0C9 0C3 0C2 0BE 0B5 0BB 0C4 0C7 0B4 0CA 0C4 0B1 0B0 0BD 0B8
0B9 0C0 0C0 0C6 0C3 0C2 0BE 0C9 0C3 0BD 0C0 0C7 0C7 0C3 0C8 0C8 0C9 0C3 0CE 0C1 0D4 0BF 0BE 0C1 0CF 0B7 0BB 0B7 0AD 0BA 0A9 0A4
stop
```

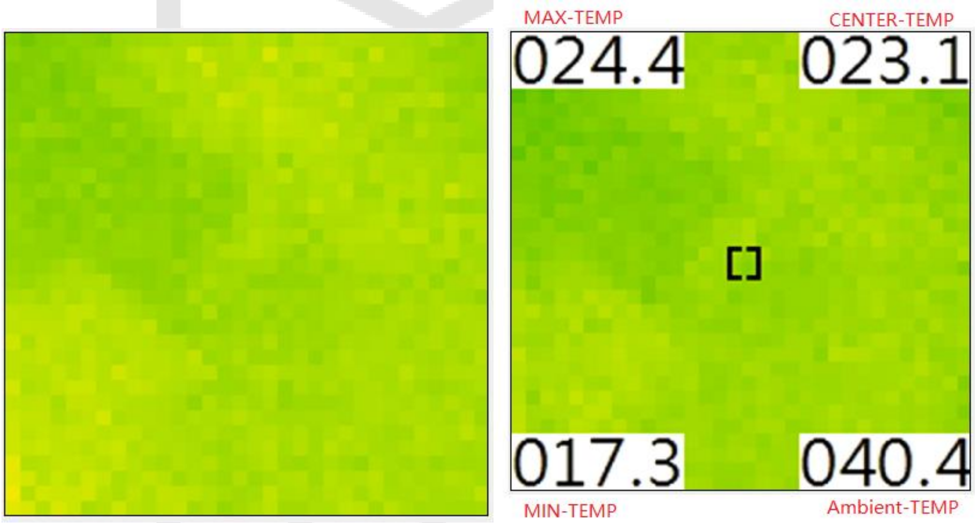
50.

Notes: the header frame is expressed in hex as 0x53 54 41 52 54 and the end frame is expressed in hex as 0x53 54 4F 50.

The command demo could be like picture on right.

OPW: It will display **CENTER-TEMP**/**Ambient-TEMP**/**MAX-TEMP**/**MIN-TEMP** on Screen for Users when it was turned on

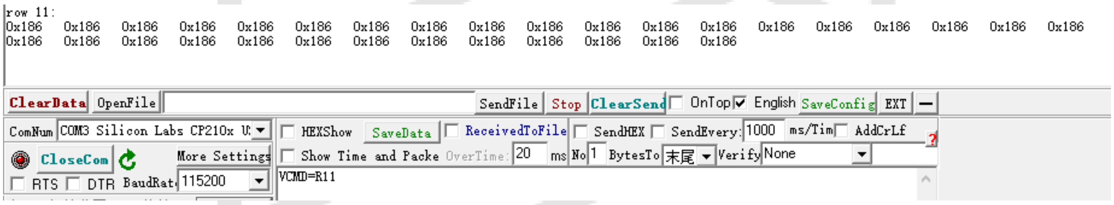
E.g.: It will display four basic temperature on each corner of the screen while it was turned on (As shown on the right side)


MAX-TEMP
024.4
CENTER-TEMP
023.1
017.3
MIN-TEMP
040.4
Ambient-TEMP

GYF: 8bit Gray Frame image will sent after you send this command. Length of data: 3585 bytes

Notes: if you want to get temperature in particular column/row. It may works:
Command: VCMD=C01
You could import the number of column/row to get pixels in the number that sent

E.g.: if you want to get all pixels in row 11rd, just sent command VCMD=R11 and receive it in Hex



```
row 11:
0x186   0x186   0x186   0x186   0x186   0x186   0x186   0x186   0x186   0x186   0x186   0x186   0x186   0x186   0x186   0x186   0x186   0x186   0x186
0x186   0x186   0x186   0x186   0x186   0x186   0x186   0x186   0x186   0x186   0x186   0x186   0x186
```

ClearData
OpenFile
SendFile
Stop
ClearSend
☐ OnTop
☑ English
SaveConfig
EXT
—
ComNum
☐ HEXShow
SaveData
☐ ReceivedToFile
☐ SendHEX
☐ SendEvery:
ms/Tim
☐ AddCrLf
CloseCom
More Settings
☐ Show Time and Packe
OverTime:
ms
No
BytesTo
Verify
☐ RTS
☐ DTR
BaudRat

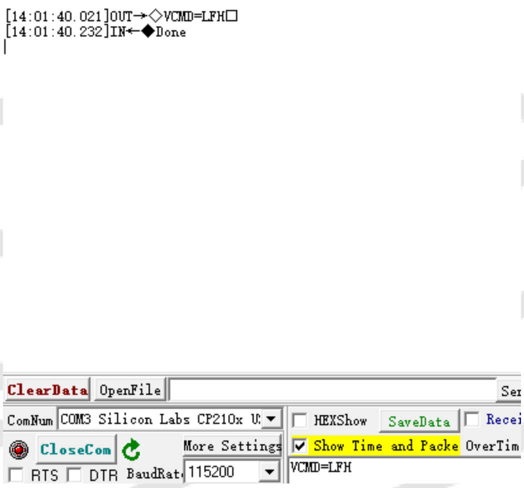
ComNum: COM3 Silicon Labs CP210x U
SendEvery: 1000 ms/Tim
OverTime: 20 ms
No 1 BytesTo 末尾
Verify: None
BaudRat: 115200

```
VCMD=R11
```

LFH: send this command to point position of forehead and save into flash. It only can recognize the point over 50℃ and save it.

Success in return **"Done"**

E.g.:



```
[14:01:40.021]OUT→◇VCMD=LFH□
[14:01:40.232]IN←◆Done
```

ComNum COM3 Silicon Labs CP210x U

☑ Show Time and Packe

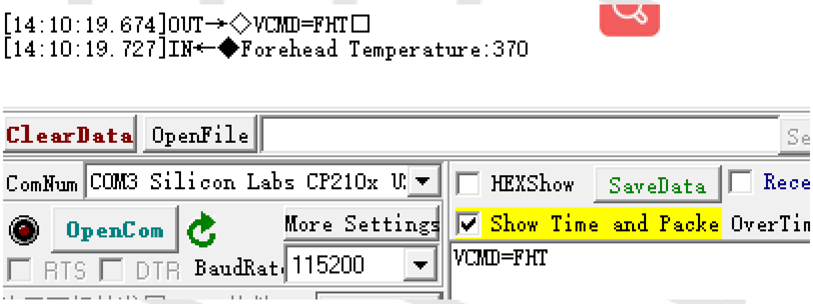
BaudRat 115200

VCMD=LFH

ClearData
OpenFile
Se
☐ HEXShow
SaveData
☐ Recei
CloseCom
More Settings
OverTim
☐ RTS ☐ DTR

FHT: it will return temperature of the point you had saved. Save about 50 num of data and correct output automatically. Length of Data: 26 bytes

E.g.:



```
[14:10:19.674]OUT→◇VCMD=FHT□
[14:10:19.727]IN←◆Forehead Temperature:370
```

ComNum COM3 Silicon Labs CP210x U

☑ Show Time and Packe

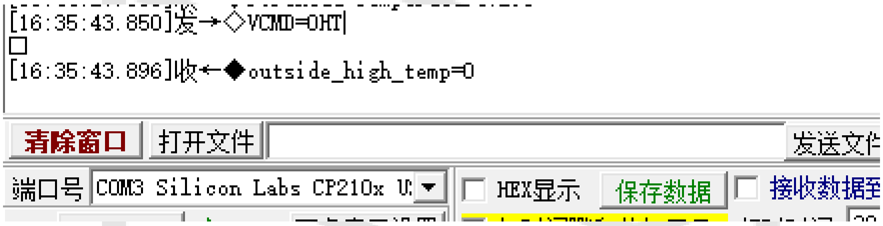
BaudRat 115200

VCMD=FHT

ClearData
OpenFile
Se
☐ HEXShow
SaveData
☐ Rece
OpenCom
More Settings
OverTim
☐ RTS ☐ DTR

OHT: This Function will open the Outside Ambient Temp Compensation to correct temperature when it changed. Length of data:21 Bytes

E.g.:



```
[16:35:43.850]发→◇VCMD=OHT
□
[16:35:43.896]收←◆outside_high_temp=0
```

BDHC: it will change the maximum limit in Forehead Temperature Correction

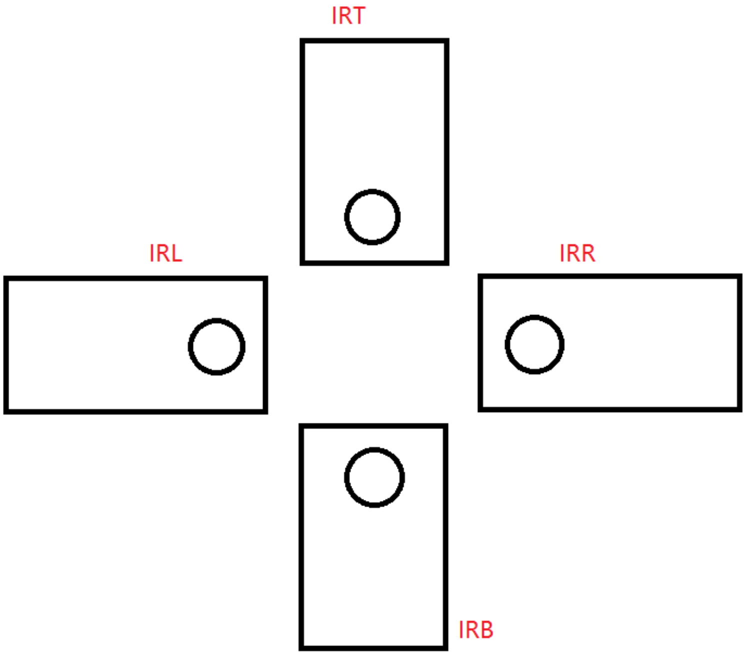
BDLC: it will change the minimum limit in Forehead Temperature Correction

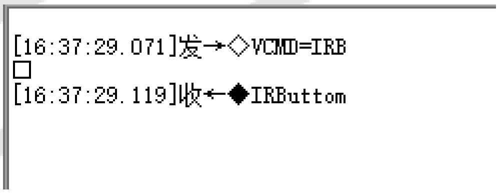
Forehead Temperature Correction:

When the temperature locate between minimum temperature limit and maximum temperature limit, it will calculate it and output more humanity

IRB/IRT/IRR/IRL: This model is use to confirm the IR Camera install direction which is use for detection area rotate

E.g.: please choose corresponding situation and send the command

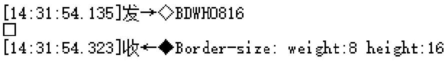




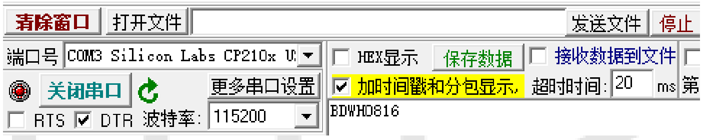
```
[16:37:29.071]发→◇VCMD=IRB
□
[16:37:29.119]收←◆IRButtom
```

BDWH: you can change the detecting area of command VCMD=FHT while using this command.

E.g.: input the head of command :**BDWH**, and follow four digits. First and twice digits represent the width of the area, and the last two numbers represent the height of the area



```
[14:31:54.135]发→◇BDWH0816
□
[14:31:54.323]收←◆Border-size: weight:8 height:16
```

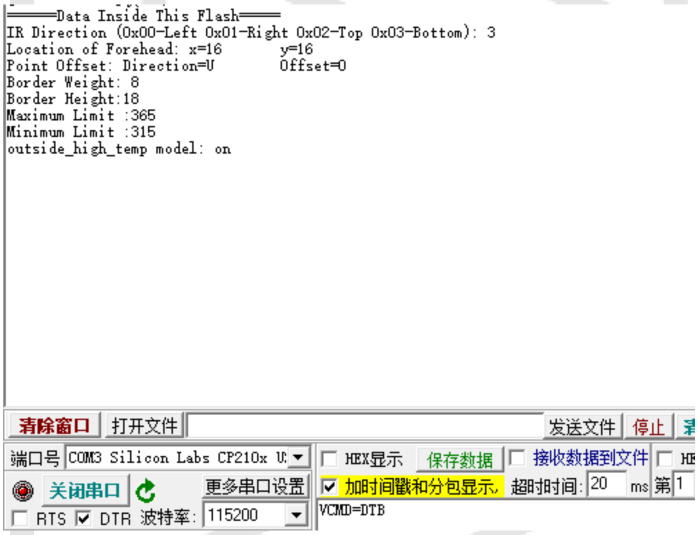


清除窗口
打开文件
发送文件
停止
端口号
HEX显示
保存数据
接收数据到文件
关闭串口
更多串口设置
加时间戳和分包显示,
超时时间:
ms
第
RTS
DTR
波特率:

```
端口号 COM3 Silicon Labs CP210x U
波特率: 115200
☐ RTS ☑ DTR
☐ HEX显示 ☑ 加时间戳和分包显示, 超时时间: 20 ms
BDWH0816
```

DTB: it will read your settings and print them out.

E.g.:



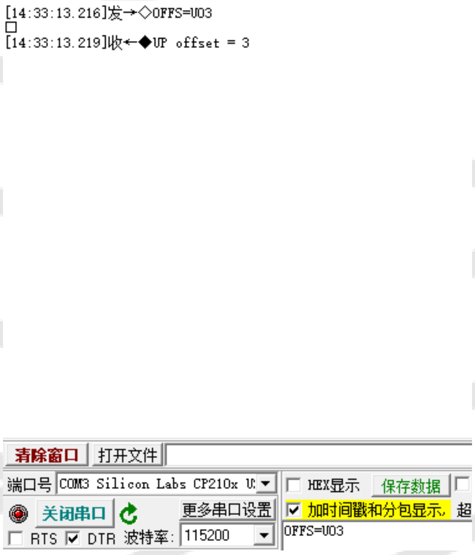
```
═════Data Inside This Flash═════
IR Direction (0x00-Left 0x01-Right 0x02-Top 0x03-Bottom): 3
Location of Forehead: x=16        y=16
Point Offset: Direction=U         Offset=0
Border Weight: 8
Border Height:18
Maximum Limit :365
Minimum Limit :315
outside_high_temp model: on
```

清除窗口
打开文件
发送文件
停止
端口号
HEX显示
保存数据
接收数据到文件
关闭串口
更多串口设置
加时间戳和分包显示,
超时时间:
ms
第
RTS
DTR
波特率:

```
端口号 COM3 Silicon Labs CP210x U
波特率: 115200
☐ RTS ☑ DTR
☐ HEX显示 ☑ 加时间戳和分包显示, 超时时间: 20 ms 第 1
VCMD=DTB
```

OFFS: if you are satisfied with the area you had set and just want to translate the matrix to get further match. Use it.

E.g.: input the head of command :**OFFS=**, and follow the direction of translation(**U**P/**D**OWN/**L**EFT/**R**IGHT). Input the step you want to move,and send it.



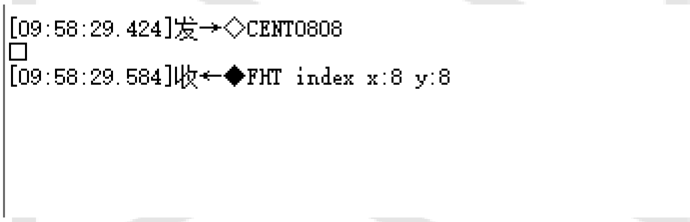
```
[14:33:13.216]发→◇OFFS=U03
□
[14:33:13.219]收←◆UP offset = 3
```

端口号 COM3 Silicon Labs CP210x U
☐ RTS ☑ DTR 波特率: 115200
☐ HEX显示
☑ 加时间戳和分包显示,
OFFS=U03

CENT: we update another way to set the coordinate of FHT center point if needed

E.g.: input the head of command :**CENT**, and follow four digits. First and twice digits represent the X coordinate of the area, and the last two numbers represent the Y coordinate of the point

The data will save into flash after you receive the information from Hestia.

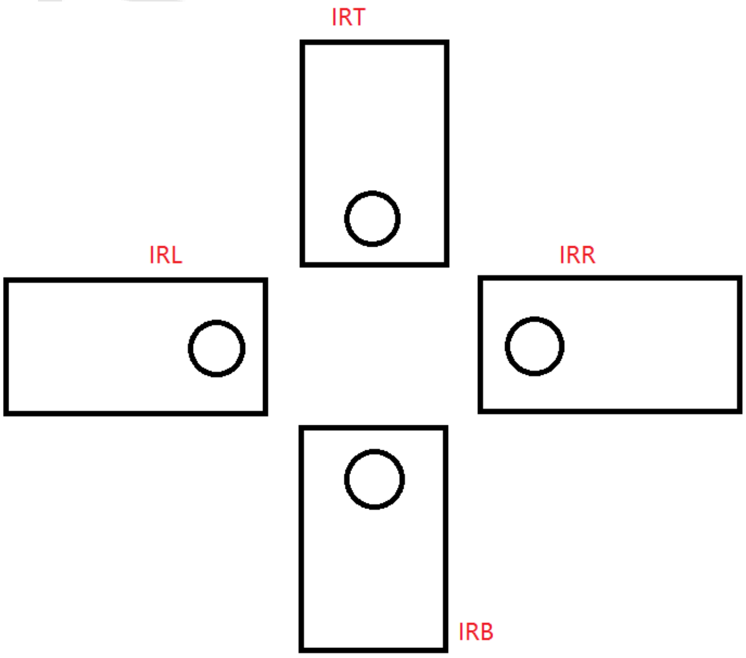


```
[09:58:29.424]发→◇CENT0808
□
[09:58:29.584]收←◆FHT index x:8 y:8
```

FHT-Detecting area setting:

Step1:

Comfirm the IR Camera install direction and Send command.



Step2:

Set the detecting area by using command BDWH and follow the weight and height you want to.

For example: **BDWH0816** means that the weight of area is 8px and the height of area is 16px.

Step3:

Put High Temperature object(over 50℃) into the area, and move it to the place you interest.

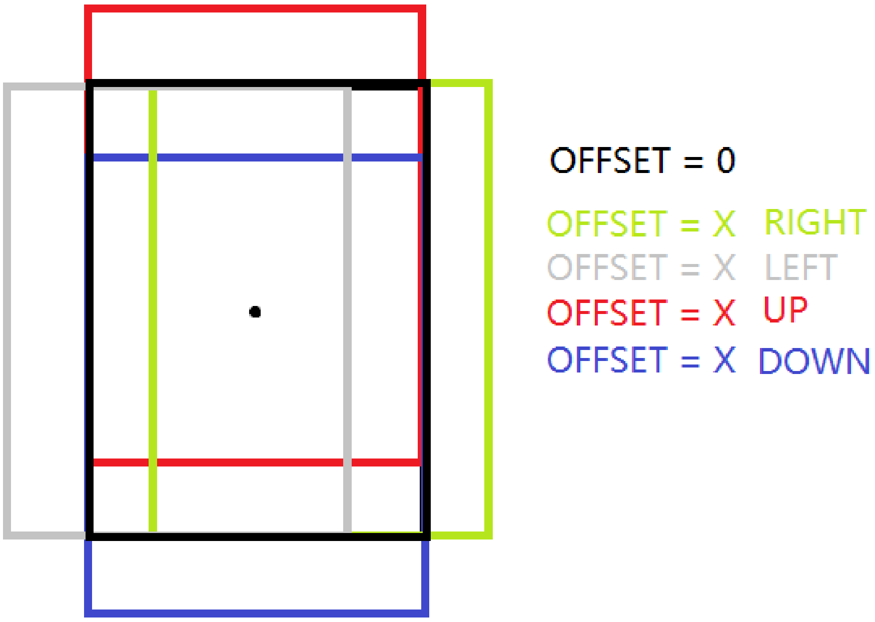
Send the command ” VCMD=LFH”.

If it return “Done” it means that you success.

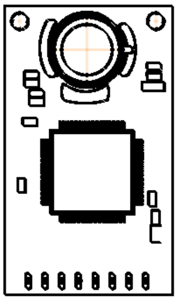
(Notes: you can use command “CENT” to change the center point of POI if needed)

Step4:

Change offset to get your ideal area.


OFFSET = 0
OFFSET = X RIGHT
OFFSET = X LEFT
OFFSET = X UP
OFFSET = X DOWN

3.2. Pin Definition

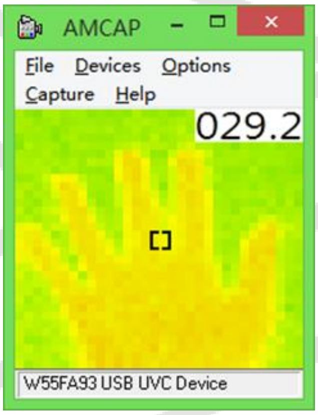
From Left to Right		
Pin_1	USB_5V	
Pin_2	USB_GND	
Pin_3	USB_D-	
Pin_4	USB_D+	
Pin_5	HUART_TX	
Pin_6	HUART_RX	
Pin_7	UART_TX	
Pin_8	UART_RX	

3.3. Additional explanation

Temperature related specifications and description		
Accuracy	±1℃	-30~45°C target temperature range, 25°C ambient temperature, 90% humidity environment test calibration @0.75m.
Homogenization	0.3℃	Center and edge temperature uniformity correction, the correction conditions refer to the above.
FPS (Frame per sec.)	7FPS	Normal operation 5~7 fps raw temperature data output
Filter	default	Data Filter and algorithm planted inside helping to achieve better effect for different applications, such as human body temperature screening.
UART/HUART Frequency	115200Hz	Support High-Speed UART interface, temperature data UART printing
USB	UVC	USB Video Class data is default. Also, this port can push out all the temperature data via especial protocol. (if needed please contact us for FAE).
API	UART CMD List	The highest temperature, lowest temperature, standard temperature, target point temperature output in the picture can be adjusted according to the application scene

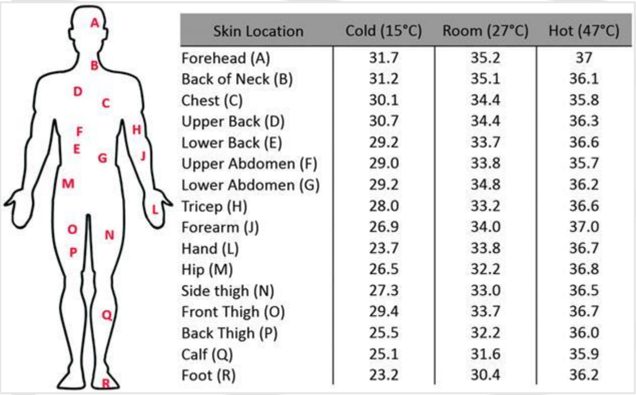
3.4. Demonstration

Open **AMCAP.exe** in PC and you can see the image on screen. The right-upper corner of the screen will display the centum temperature. This data is updated with real time, depending on the frame rate. The thermal imaging color palette has modes to choose for different applications. The default palette is red and green schemes to highlight the difference between background and target.


AMCAP
File
Devices
Options
Capture
Help
029.2
W55FA93 USB UVC Device

4. Application Notes

When Hestia is used for Human body temperature detecting, it should be kept in mind that the target temperature is different from the core temperature. Quote the standard healthy people's surface temperature in different situations.


A
B
D
C
F
H
E
G
J
M
L
O
N
P
Q
R

Skin Location	Cold (15°C)	Room (27°C)	Hot (47°C)
Forehead (A)	31.7	35.2	37
Back of Neck (B)	31.2	35.1	36.1
Chest (C)	30.1	34.4	35.8
Upper Back (D)	30.7	34.4	36.3
Lower Back (E)	29.2	33.7	36.6
Upper Abdomen (F)	29.0	33.8	35.7
Lower Abdomen (G)	29.2	34.8	36.2
Tricep (H)	28.0	33.2	36.6
Forearm (J)	26.9	34.0	37.0
Hand (L)	23.7	33.8	36.7
Hip (M)	26.5	32.2	36.8
Side thigh (N)	27.3	33.0	36.5
Front Thigh (O)	29.4	33.7	36.7
Back Thigh (P)	25.5	32.2	36.0
Calf (Q)	25.1	31.6	35.9
Foot (R)	23.2	30.4	36.2

To judge if target person is under common temperature or unusual situation, we suggest comparing the target area temperature with the common/average standard. Once the difference above 1℃, it can be briefly judge as an emergency.

Under 25℃ condition, the forehead should be around 35.2℃, and under lower ambient temperature the forehead temperature should be even lower. It's assumed that the costumer shouldn't use the forehead temperature compare to 36.3℃ to judge if temperature is correct.

5. Reversion History

V1.0	Initial release
V1.1	Corrected data display format and detailed CMD command operation
V1.2	Reduce the amount of date in DAT model and added CFT model.
V1.21	Add mechanical details and restructure the documents.
V1.22	Add TTT/JJJ model and add OPW model
V1.23	Add GYF model and R/C model
V1.24	Add LFH model and FHT model
V1.25	Add IRX model, OHT model, BDHC/BDLC model
V1.26	Add BDWH model, DTB model, and OFFS model
V1.27	Add CENT model