



Product Specifications

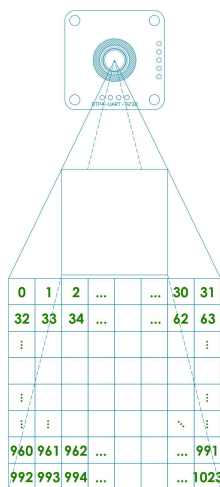
laboratory temperature conditions: 25°C.

Parameter	min	Typ	Max	Unit
Supply voltage	4.5	5	5.5	V
Supply current		35		mA
pixels		1024		px
Spectral range	7.7		15	μm
Object temperature range(*)	-10		200	°C
Operating temperature	-20		70	°C
IR refresh rate		2		Hz
Accuracy(**)		±2		%
Resolution digital		0.1		°C
Emissivity(fixed)		0.97		ε
Standard start-up time		30		sec
Stabilization time	1			min
FOV	33° x 33°			
Weight (without cable)	8.3g			
Communication interface	UART TTL			
Relative humidity	95% Max. non-condensing			

*: The DTPA can detect higher temperatures, but is not calibrated above 200°C

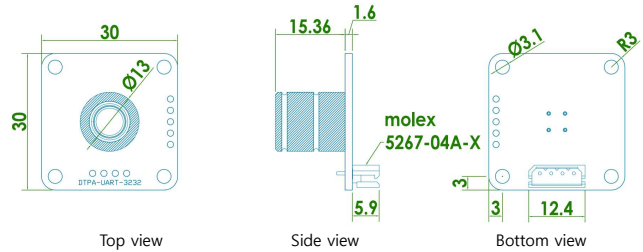
***: ±2% of reading or ±2°C whichever is greater. All accuracy specifications only apply under settled isothermal conditions and specified for the central pixel(527).

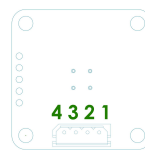
32 x 32 Optical Orientation



Dimensions / Pin Configuration

unit: mm



Bottom view	No.	Name	Description
	1	5V	supply voltage
	2	TX	UART Output 3.3V
	3	RX	UART Input 3.3V (5V tolerant)
	4	GND	ground

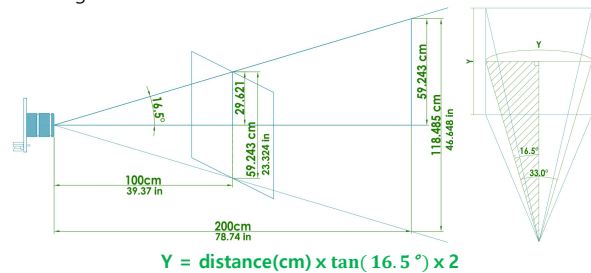
※ Connector information: molex

- pcb side 5267-04A (P/N 22035045)

- mates with 5264-04 (P/N 50375043)

Calculate Field of View

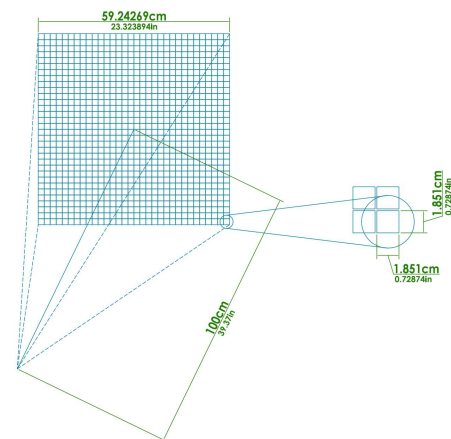
The FOV determines the size of the infrared measurement area according to the distance.



$$Y = \text{distance(cm)} \times \tan(16.5^\circ) \times 2$$

$$\text{e.g. } Y = 100\text{cm} \times 0.296213 \times 2 \approx 59.243 \text{ cm}$$

$$Y = 200\text{cm} \times 0.296213 \times 2 \approx 118.485 \text{ cm}$$



size of 1 pixel (distance: 1m)

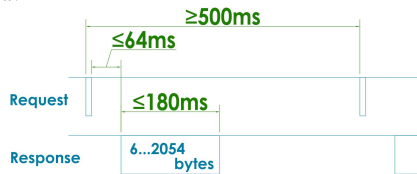


UART Protocol

- BaudRate: 115,200bps(fixed), data bit: 8, stop bit:1, parity: none, flow control: none
- I/O is 3.3V LV TTL (5V tolerant)

Timing

- The minimum data request cycle is 500ms, regardless of the number of request data.



UART Data Format

- request command
- The frame of request data consists of 6 bytes. The byte structure is explained below. Note that an 'X' refers to a variable bit containing dynamic data.

Request (main → DTPA)			
Byte	Field Name	data	DEC
1	START	0x11	17
2	Start Address(MSB)	0b00000XXX	0...1024(*)
3	Start Address(LSB)	0bXXXXXXX	
4	No. of Register(MSB)	0b00000XXX	1...1025(**)
5	No. of Register(LSB)	0bXXXXXXX	
6	END	0x98	152

(*) Start Address(SA): minimum: 0 maximum: 1024

(**) No. of Register(NR) ≤ (1025-SA) , minimum:1, maximum: 1025

The accessible address is limited to the address map table. Otherwise there is no response from the sensor.(see Address map)

e.g. SA:1024, NR: 1 (ok)

SA:1024, NR: 2 (X) - no response

SA:1, NR:1024 (ok)

SA:1, NR:1025 (X) - no response

The (SA, NR, response data)structure would be: 0x[MSB][LSB], where MSB and LSB are each two hexadecimal numbers (8 bits).

- response data

- The number of bytes in the response frame depends on the NR.

Response (DTPA → main)			
Byte	Field Name	data	DEC
1	START(MSB)	0x16	22
2	START(LSB)	0x98	152
3	Temperature of the SA(MSB)	0xXX	
4	Temperature of the SA(LSB)	0xXX	
...	...		
(NR*2)+1	Temperature of the end address(MSB)	0xXX	
(NR*2)+2	Temperature of the end address(LSB)	0xXX	
(NR*2)+3	END(MSB)	0x1A	26
(NR*2)+4	END(LSB)	0x9C	156

e.g. No. of Register(NR): 2 → total response bytes: (2*2)+4 = 8 bytes

No. of Register: 1025 → (1025*2)+4= 2054 bytes

Address map

Address		Data Length	Type	Description
HEX	DEC	Short		
0x0000	0	1	Signed	Ambient Temperature(Ta)
0x0001	1	1	Signed	Temperature of PIXEL 0
0x0002	2	1	Signed	Temperature of PIXEL 1
0x0003	3	1	Signed	Temperature of PIXEL 2
0x0004	4	1	Signed	Temperature of PIXEL 3
:	:	:	:	:
0x03FF	1023	1	Signed	Temperature of PIXEL 1022
0x0400	1024	1	Signed	Temperature of PIXEL 1023

The data is in 2's complement format.

- Request command examples:

Read all temperatures: 0x11,0x00,0x00,0x04,0x01,0x98 (6-byte)
SA: 0 NR: 0x0401(1025d)

Read PIXEL 0...1023: 0x11,0x00,0x01,0x04,0x00,0x98 (6-byte)
SA: 1 NR: 0x0400(1024d)

Temperature Calculation

The result is calculated by following expressions (valid for both PIXEL and Ta):

1. Convert it to decimal value i.e. 0x016D = 365d
 2. Multiply by 0.1(or divide by 10) i.e. 365 x 0.1 = 36.5°C
- 0xFF1 = -15 → -1.5°C
0xFF9C = -100 → -10.0°C
0x00FF = 255 → 25.5°C

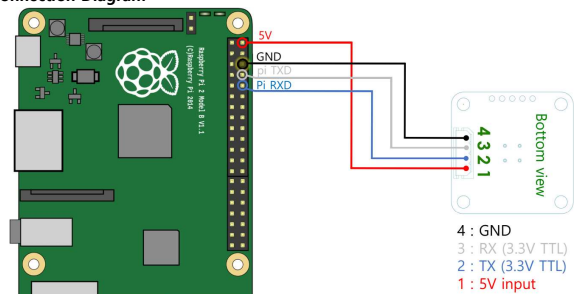
Tutorial(Raspberry Pi 2)

- Requirements

Hardware: Raspberry Pi 2 , DTPA-UART-3232

Software: wiringPi library

- Connection Diagram



- Sample code

https://www.diwellshop.com/web/en/DTPA/DTPA_raspberry2_example.zip

- Expected Results.

```
Ta: 32.1
Pixel Temperature:
0p(26.3)
1p(25.7) 2p(25.3) 3p(26.4) 4p(25.5) 5p(26.9) 6p(25.0) 7p(25.6)
8p(25.4) 9p(25.8) 10p(26.5) 11p(25.4) 12p(26.9) 13p(26.2) 14p(26.3)
15p(25.7) 16p(25.6) 17p(25.9) 18p(26.5) 19p(26.9) 20p(24.7) 21p(25.6)
22p(26.5) 23p(27.3) 24p(28.7) 25p(29.2) 26p(29.6) 27p(28.5) 28p(28.1)
29p(26.7) 30p(28.3) 31p(28.0) 32p(26.8) 33p(26.3) 34p(26.2) 35p(25.3)
```



Products handling precaution

- ※ When it comes to dust removal by air, the best method is to use a blower, and to avoid using compressed air.
- ※ Do not press the lens with your hands or any other object.
- ※ Do not scratch the lens surface with sharp objects.
- ※ Voluntary disassembly and modification of the product is prohibited.
- ※ Avoid direct sunlight, chemical substance, heat or fire.
- ※ Water resistance is not guaranteed.
- ※ Do not hold the sensor by hand during the measurement.
- ※ For stable temperature measurement, avoid measurement immediately after turning on the power of the sensor. And power must always be supplied, not on/off

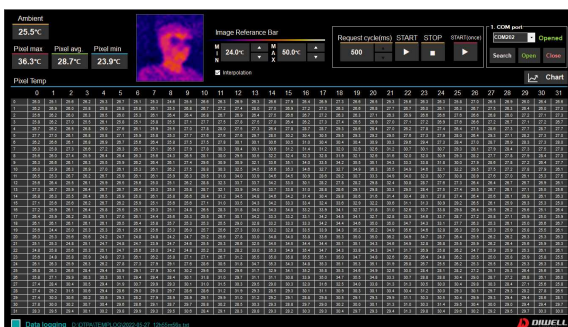
PC Software

The program runs in the Windows 10 environment.

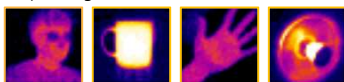
It is not guaranteed to be used on other OS.

For more information, refer to the Test Board manual.

https://www.diwellshop.com/web/en/DTPA/DTPA-UART-3232_Testboard_en.pdf



- sample images



Additional information

Manufacturer: DIWELL Electronics Co., Ltd. (South Korea)

Technical support: <mailto:expoeb2@diwell.com>, <mailto:dsjeong@diwell.com>

Revision history

Version	Date(Y,M,D)	Description
1.0.0	2022. 5. 27.	First version is released