



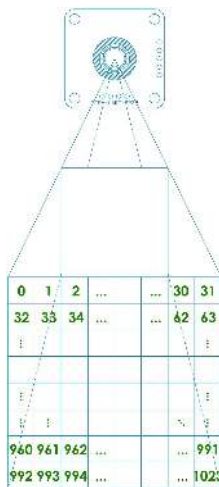
### Product Specifications

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			

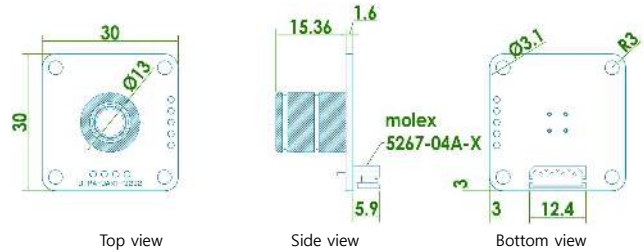
\*: The DTPA can detect higher temperatures, but is not calibrated above 200°C  
 \*\*: ±2% of reading or ±2°C whichever is greater. All accuracy specifications only apply under settled isothermal conditions and specified for the central pixel(527).

### 32 x 32 Optical Orientation



### Dimensions / Pin Configuration

unit: mm

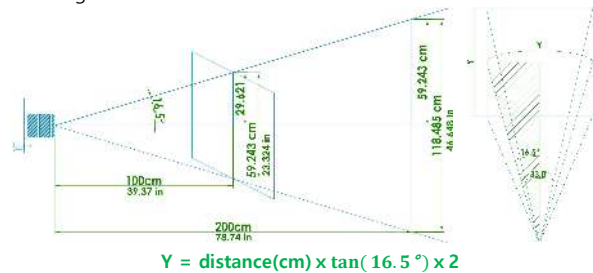


Bottom view	No.	Name	Description
	1	5V	supply voltage
	2	TX	UART Output 3.3V
	3	RX	UART Input 3.3V (5V tolerant)
	4	GND	ground

※ Connector information: molex  
 - pcb side 5267-04A (P/N 22035045)  
 - mates with 5264-04 (P/N 50375043)

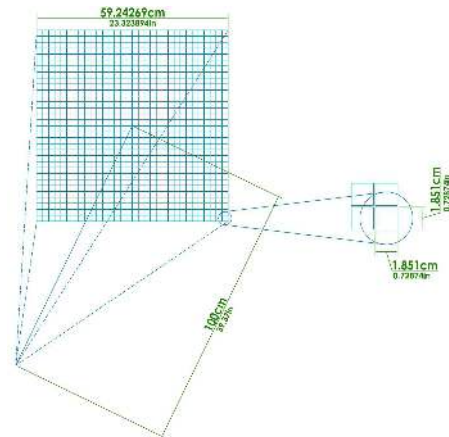
### Calculate Field of View

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



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

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)

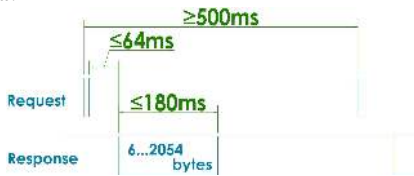


### UART Protocol

- 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)	0bXXXXXXXX	
4	No. of Register(MSB)	0b00000XXX	1...1025(**)
5	No. of Register(LSB)	0bXXXXXXXX	
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
- 0xFFFF1 = -15 → -1.5°C  
0xFF9C = -100 → -10.0°C  
0x00FF = 255 → 25.5°C

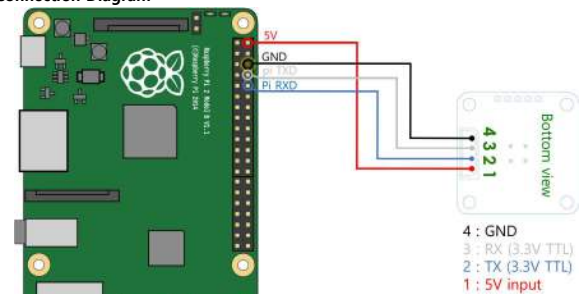
### Tutorial(Raspberry Pi 2)

#### - 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](https://www.diwellshop.com/web/en/DTPA/DTPA_raspberry2_example.zip)

#### - Expected Results.

```

Ta: 32.1
pi=1 Temperature:
0p(26.3)
1p(26.7) 2p(26.3) 3p(26.4) 4p(26.5) 5p(26.9) 6p(26.9) 7p(26.6)
8p(25.4) 9p(25.8) 10p(26.5) 11p(25.4) 12p(26.9) 13p(26.2) 14p(26.3)
15p(26.7) 16p(25.4) 17p(26.9) 18p(26.5) 19p(26.8) 20p(24.7) 21p(26.6)
22p(26.5) 23p(27.3) 24p(28.7) 25p(28.2) 26p(28.6) 27p(28.5) 28p(26.1)
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.

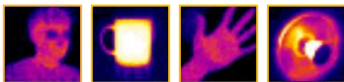
It is not guaranteed to be used on other OS.

For more information, refer to the Test Board manual.

[https://www.diwellshop.com/web/en/DTPA/DTPA-UART-3232\\_Testboard\\_en.pdf](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