DTP Series Specification

Non-contact Infrared Temperature Sensor

Ordering Information

DTP - (1) - H(2)

(1) interface		(2) lens code	FOV
UART	UART 3.3V	04	3.814°
485	RS-485 Modbus	08	7.16°

* DTP-UART-H04: UART interface, FOV=3.814°
* DTP-485-H08: RS-485 interface Modbus protocol, FOV=7.16°

Product Specifications

All of voltages refer to 3.3V, ambient temperature is 25℃ unless otherwise note.

| Parameter		min	Typ	Max	Unit
Supply voltage		3.2	3.3	3.6	V
Supply current		11	13		mA
Filter type		F5.5 (LWP cut on 5.5μm)			
Object temperature range		-40		380	℃
Operating temperature		-20		70	℃
IR refresh rate			10		Hz
Accuracy(*)			±2		%
Resolution digital			0.1		℃
Emissivity		0.1	0.97	1.0	ε
Standard start-up time			200		ms
Stabilization time		1			min
Weight	485	H04: 3.19g, H08: 2.96g			
	UART	H04: 3.13g, H08: 2.90g			
Communication interface		UART TTL(3.3V), RS-485			
Baud rate(Fixed)		19200bps			
Relative humidity		95% Max. non-condensing			

*: ±2% of reading or ±2℃ whichever is greater.
Accuracy is only effective if the object is fully covered by the sensor's FOV and applicable to stable temperature conditions.
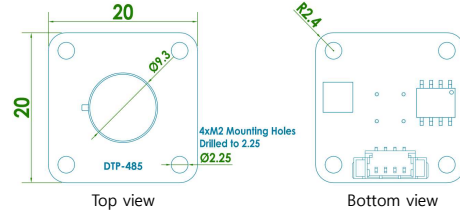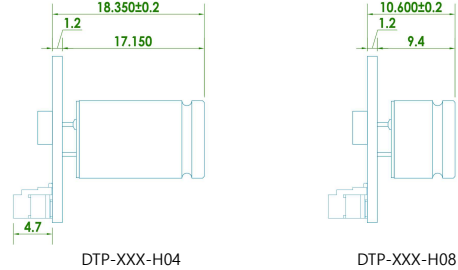
Dimensions

unit: mm

- DTP-UART
  Top view / Bottom view

- DTP-485
  Top view / Bottom view
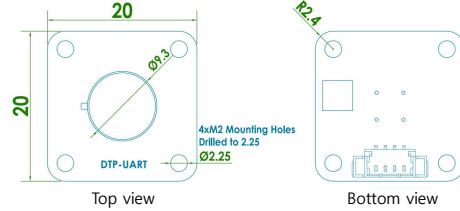
- Side view
  DTP-XXX-H04   DTP-XXX-H08

Pin Configuration

No.	DTP-UART	DTP-485
1	GND	GND
2	RX	D+
3	TX	D-
4	3.3V	3.3V

Accessories

	100mm length, four wire open cable	1 pc

Calculate Field of View

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

unit: mm

Angle	FOV
7.16°	 6.75 7.16° 38.03 69.31 unit:mm 0 250 500 $2 \times \tan(7.16°/2) \times distance(mm) + 6.75$ (mm)
3.814°	 8 3.814° 41.29 74.59 unit:mm 0 500 1000 $2 \times \tan(3.814°/2) \times distance(mm) + 8$ (mm)
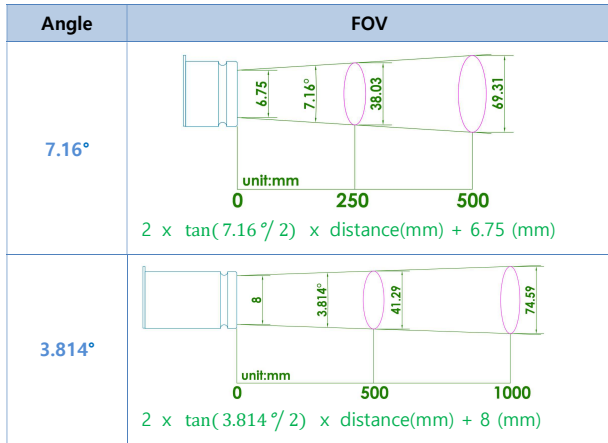
Protocol downloads

DTP-UART: https://www.diwellshop.com/web/en/DTP/DTP-UART_protocol_EN.pdf
DTP-485: https://www.diwellshop.com/web/en/DTP/DTP-485_protocol_EN.pdf

Object Temperature To, Ambient Temperature: Ta

To is the object temperature derived from thermopile and ambient sensor outputs. Ta stands for ambient temperature.

0x016D(hex) = 365(dec) → means 36.5℃

0xFFF1(hex) → 0x000F(two's complement)=15 → means -1.5℃

- Output Data Limit
  Ta: 0xFE83(-38.1℃) ... 0x4E2(120.0℃)
  To: 0xFE70(-40.0℃) ... 0xED8(380.0℃)

Emissivity Correction

The DTP is calibrated for an object emissivity of 0.97. It can be easily customized by the customer for any other emissivity in the range 0.1...1.0. Refer to the protocol pdf to adjust emissivity.

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.
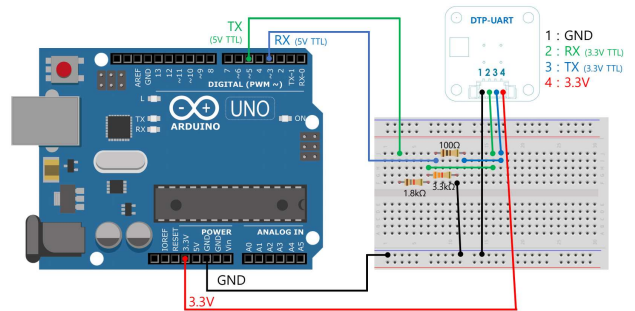※ Water resistance is not guaranteed.

Tutorial 1(Arduino UNO)

- **Connection Diagram**
  - DTP-UART: https://www.diwellshop.com/web/en/DTP/DTP-UART_Arduino.zip
  Hardware: Arduino Uno, DTP-UART Sensor, 100Ω, 1.8kΩ, 3.3kΩ
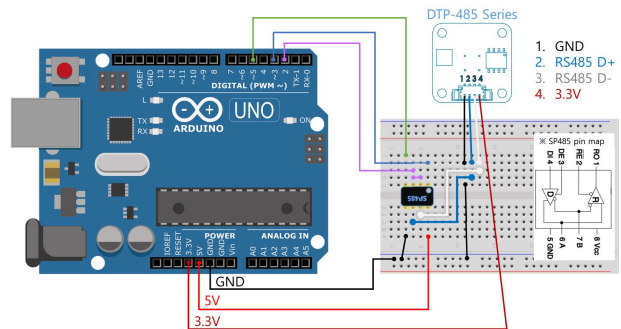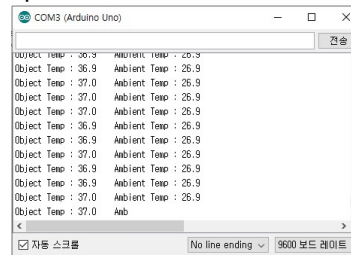 Software : Arduino IDE

- DTP-485 : https://www.diwellshop.com/web/en/DTP/DTP-485_Arduino.zip
  Hardware: Arduino Uno, DTP-485 Sensor, RS-485IC,
  Software : Arduino IDE
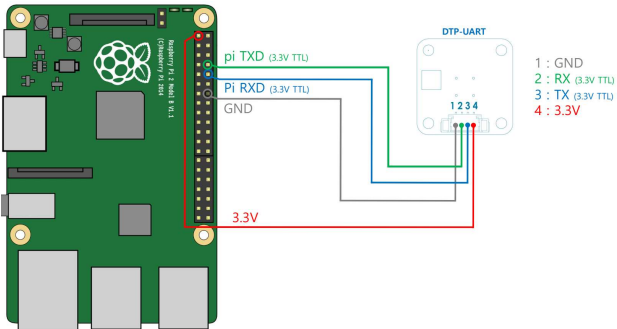

- **Expected Results.**

Tutorial 2(Raspberry pi 2)

- Connection Diagram

- DTP-UART: https://www.diwellshop.com/web/en/DTP-UART_Raspberry.zip

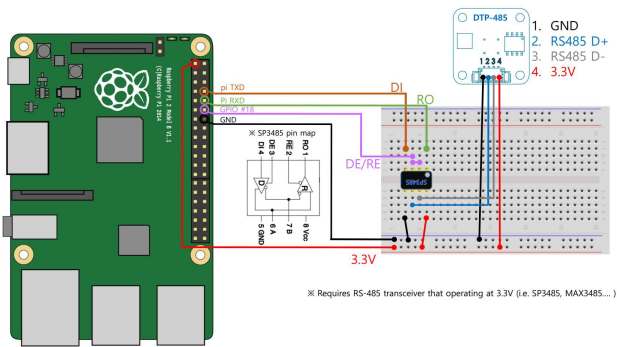 Hardware: Raspberry Pi 2, DTP-UART Sensor.

  Software : wiringPi library

pi TXD (3.3V TTL)
Pi RXD (3.3V TTL)
GND

DTP-UART
1 : GND
2 : RX (3.3V TTL)
3 : TX (3.3V TTL)
4 : 3.3V

3.3V

- Connection Diagram

- DTP-485: https://www.diwellshop.com/web/en/DTP-485_Raspberry.zip

  Hardware: Raspberry Pi 2, DTP-485 Sensor. RS-485 transceiver(3.3V operating)

  Software : wiringPi library

DTP-485
1. GND
2. RS485 D+
3. RS485 D-
4. 3.3V

pi TXD
Pi RXD
GPIO #18
GND

DI
RO
DE/RE

3.3V

※ SP3485 pin map

※ Requires RS-485 transceiver that operating at 3.3V (i.e. SP3485, MAX3485....)

- Expected Results.

```
 1- Object: 33.2   Ambient: 26.0
 2- Object: 33.2   Ambient: 26.1
 3- Object: 33.2   Ambient: 26.0
 4- Object: 33.2   Ambient: 26.0
 5- Object: 33.3   Ambient: 26.1
 6- Object: 33.2   Ambient: 26.1
 7- Object: 33.4   Ambient: 26.1
 8- Object: 33.1   Ambient: 26.1
 9- Object: 33.4   Ambient: 26.1
10- Object: 33.2   Ambient: 26.1
11- Object: 33.1   Ambient: 26.0
```

Additional information

Revision history

Version	Date(Y,M,D)	Description
1.0.0.	2022.7.26	First version is released
1.0.1	2022.10.27	Fix Dimension Errors(page 1)