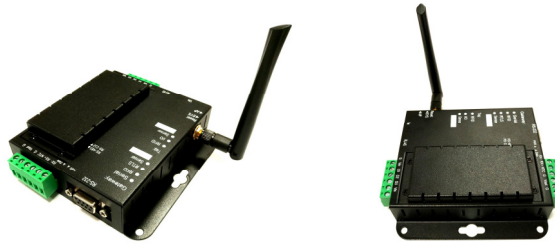


BLE Sensor Tag

BLET-[Sensor]-[Temperature]-[I/O]



1. Features:

- Rich sensor options: Temperature, Humidity, PM2.5, CO, CO2, CH2O, VOC, pressure, RFID
- BLE beacon
- Support external I/O control interface, ex. PIR or Relay
- Support Real Time Location System (RTLS) applications
- Configurable auto report period and power level

2. Applications:

- Location system: Asset, Passenger, Patient, Trailer
- Access control: Garage, Enterprises, Bank, Vehicle, Factory, Hospital, Superstore, School, Warehouse
- Logistic management, Cargo tracking, Airport baggage management
- Local Area Real Time Location Systems (RTLS)
- Asset Management, Internet of Things (IOT) applications

3. Model No. naming: BLET-[Sensor]-[Temperature]-[I/O]

[Sensor]	[Temperature]	[I/O]
RFID:Mifare	TH:Temperature/Humidity	PIR:PIR sensor
PM25: PM2.5	THP:	*DIO:Digital I/O
CO:Carbon monoxide	Temperature/Humidity/Pressure	(Empty): N/A
CO2:Carbon dioxide	NTC: NTC Temperature sensor	
CH2O: Formaldehyde	(Empty): N/A	
VOC:Volatile organic compounds		
(Empty): N/A		

EX: BLET-PM25-TH-DIO, BLET-THP, BLET-CO2-PIR

Remark:

Each sensor will be optioned by the specification if the requirement is over the range of the default sensor model. Please check the next section for reference.

*DIO: Digital In/Out to be customized, please offer the requirements

4. Sensor specifications

4.1 PM2.5-1: (Wnsen ZH03A)

- Working Current 70-140(mA)
- Dormancy current 70mA
- Response Time $\leq 90s$
- Working Humidity 15%RH-80%RH(no condensation)
- Working Temperature $-20\sim 40^{\circ}C$
- PM2.5 concentration output range 0-1000ug/m3
- Period $1000ms\pm 5\%$
- High level output at the period start 200us(theoretical value)
- Low level output at the period end 200us (theoretical value)

4.2 CO: (Winsn ZE-07-CO)

- Measurement Range: 0~500 ppm
- Resolution ratio: 0.1 ppm
- Response time(T90) $\leq 60 S$
- Repeatability: <3% output value
- Stability (/year): <10%
- Zero drift($-20^{\circ}C \sim 40^{\circ}C$): $\leq 10 ppm$

4.3 CO2: (Winsen MH-Z19B)

- Average current: < 60mA(@5V)
- Peak current:150mA (@5V)
- Preheat time: 3 min
- Response Time: $T90 < 120 s$
- Working temperature: $0 \sim 50^{\circ}C$
- Working humidity: 0~ 90% RH (No condensation)
- Measuring Range: 0~2000 ppm
- Accuracy: $\pm (50ppm+3\% \text{ reading value})$

4.4 CH2O: (Winsen ZE08-CH2O)

- Measurement Range: 0-5 ppm
- Sensitivity: $(0.45\pm 0.15) \mu A/ppm$
- Resolution ratio: $\leq 0.01ppm$
- Response time (T90): $\leq 60S$
- Repeatability: < 2% output value
- Zero drift ($-20^{\circ}C \sim 40^{\circ}C$): $\leq 0.2ppm$
- Humidity Range: 15% ~90% RH

- Temperature Range: -20°C ~ 50°C
- Pressure range: normal atmosphere $\pm 10\%$

4.5 VOC: (Winsen ZP01)

- Target Gas: formaldehyde, benzene, carbon monoxide, hydrogen, alcohol, ammonia, smoke of cigarette, essence &etc.
- Output Data: 0~3 grade pollution signal
- Working Current: $\leq 60\text{mA}$
- Warm Up Time: ≤ 3 min
- Response Time: $\leq 20\text{s}$
- Recovery Time: $\leq 60\text{s}$
- Operating Temperature: 0~50°C
- Operating Humidity: $\leq 95\% \text{RH}$
- Storage Temperature: -20~60°C
- Sensitivity Attenuator: $\leq 1\%/\text{year}$

4.6 TH: (SENSIRON SHT-20)

- Humidity Accuracy: $\pm 3\% \text{RH}$
- Temperature Accuracy: $\pm 0.3\text{ }^\circ\text{C}$
- Energy consumption: $3.2\mu\text{W}$ (at 8 bit, 1 measurement / s)
- RH operating range: 0 - 100% RH
- Operating range: -40 to +125 °C (-40 to +257 °F)
- RH response time: 8 sec ($\tau_{63\%}$)

4.7 THP: (BOSH BME280)

- Operation range: -40~+85 °C, 0~100 % rel. humidity, 300~1100 hPa
- Temperature sensor
 - Accuracy @ 25 °C: $\pm 0.5\text{ }^\circ\text{C}$
 - Accuracy @ 0~65 °C(full): $\pm 1\text{ }^\circ\text{C}$
- Humidity sensor:
 - Response time 1 s
 - Accuracy tolerance $\pm 3\%$ relative humidity
 - Hysteresis $\pm 1\%$ relative humidity
- Pressure sensor:
 - RMS Noise: 0.2 Pa, equiv. to 1.7 cm
 - Offset temperature coefficient: $\pm 1.5\text{ Pa/K}$, equiv. to $\pm 12.6\text{ cm}$ at 1 °C temperature change

4.8 NTC:

- Resistance at 25 degrees C: $10\text{K} \pm 1\%$

- B25/50 = 3950±1%
- Thermal time constant ≤ 15 seconds
- Thermistor temperature range -40 °C to 200 °C
- Wire: 100cm, 28 AWG PVC
- Head: Stainless, 6*30mm

4.9 RFID:

- Supports ISO/IEC 14443 A/MIFARE and NTAG
- Supports MF1xxS20, MF1xxS70 and MF1xxS50 encryption in Read/Write mode
- Sleep current: <80uA
- Peak current: <30mA
- Frequency: 13.56MHz
- Tag: mifare1 S50 、 mifare1 S70 、 mifare UltraLight 、 mifare Pro 、 mifare Desfire
- Working Temperature: -20~80 Degree C
- Storage: -40~85 Degree C
- Humidity: 5%~95%

5. Beacon Specifications:

- Frequency band: 2.4GHz ISM (2.40000 – 2.4835GHz)
- Microcontroller: 32-bit ARM Cortex M0
- Range: max. 50 m in open space
- TX Power: Max. 3 dBm
- TX current consumption of 15.6 mA (radio only, 0 dbm)
- Operation Temperature: -40 °C to +70 °C
- Dimensions: 5.5 × 4 × 0.8 cm
- Antenna Gain: max. 2 dB

6. Output Format:

\$<msg type>,<reader id>,<tag type>,<tag id>,<battery>,<button>,<G-sensor>,<sensor>,<RSSI>#

Field	Description
\$	start of report
msg type	Type of message ex. 0: general scanner, 1: tag scanner
reader id	6 bytes ID of reader in hex => 12 chars
tag type	type of tag ex. 1: tag w/o g-sensor, 2: tag w/ g-sensor ..
tag id	6 bytes ID of tag in hex => 12 chars
tag batt	batt voltage of tag in 1/10 volt unit
tag button status	button status ex. 0: released, 1: pushed
tag motion status	motion status ex. 0: non-moving, 1: moving

reserved	Reserved for external sensor data (11 bytes)
tag rssi	tag read rssi
#	end of report

example:

\$1,E2C69918FD94,1,FFC98B7FC1A9,32,0,0,,-55#

\$1,E2C69918FD94,1,FFC98B7FC1A9,32,1,1,,-55#

\$1,E2C69918FD94,1,FFC98B7FC1A9,32,1,1,,-54#

\$1,E2C69918FD94,1,FFC98B7FC1A9,32,1,1,,-63#

\$1,E2C69918FD94,1,FFC98B7FC1A9,32,0,0,,-56#

7. Reader

7.1 RS-232 reader

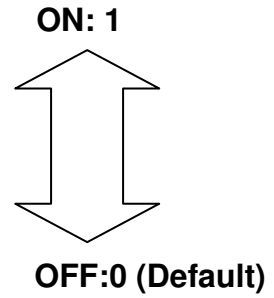
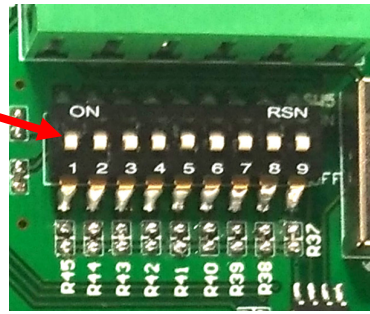
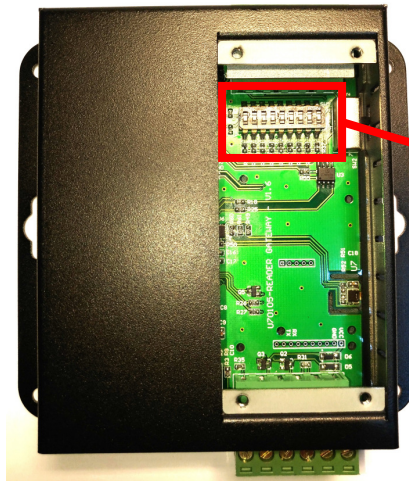


7.2 Reader Gateway: Support Wifi and Ethernet Internet connection.



8. Configuration:

DIP switch: remove the 4 screws to open the upper cover.



1	2	3	4	5	6	7	8	9
Config	Format	Report	Base-1	Base-2	Time-1	Time-2	Time-3	Time-4
0: HW 1: SW	0: Raw 1: Tag	0: Auto	00: Second 01: Minute 10: Hour 11: Day *Remark		0000:1 0001:2 0010:3 0011:4 *Remark	0100:5 0101:6 0110:7 0111:8	1000:9 1001:10 1010:11 1011:12	1100:13 1101:14 1110:15 1111:16
		1: Poll	<p>Poll the sensor value by the command set via RS-232 or RS-485, please check the command table. If you set the Modbus RTU command, the pin setting will indicate the Modbus ID: 1~64</p> <p>The following string indicates the DIP No.: [4] [5] [6] [7] [8] [9]</p> <p>000000:1 010000:17 100000:33 110000:49 000001:2 010001:18 100001:34 110001:50 000010:3 010010:19 100010:35 110010:51 000011:4 010011:20 100011:36 110011:52 000100:5 010100:21 100100:37 110100:53 000101:6 010101:22 100101:38 110101:54 000110:7 010110:23 100110:39 110110:55 000111:8 010111:24 100111:40 110111:56 001000:9 011000:25 101000:41 111000:57 001001:10 011001:26 101001:42 111001:58 001010:11 011010:27 101010:43 111010:59 001011:12 011011:28 101011:44 111011:60 001100:13 011100:29 101100:45 111100:61 001101:14 011101:30 101101:46 111101:62 001110:15 011110:31 101110:47 111110:63 001111:16 011111:32 101111:48 111111:64</p>					

*Remark: The other time not listed in the table will be configured by command. Please turn off the device and switch the DIP No. 1 to SW.

9. Sensor Data format:

9.1 Raw:

Sensor Value							
0x00	0x00	0x00	0x00				
Byte0	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7

Sensor value:

ASCII Value	Byte0	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7	
Sensor Name	D0	D1	D2(+/-)	D3	D4	D5	D6	D7	D8~D10
None	0X30	0X30							(Reserved)
Temperature(SHT-20)	0x30	0x31	+:0x2b,-0x2d	0~F	0~F	.0x2e	0~F	0~F	
Humidity(SHT-20)	0x30	0x32	+	0~F	0~F				
CO2	0x30	0x34	+	0~F	0~F	0~F	0~F		
CO	0x30	0x35	+	0~F	0~F	0~F	0~F		
PM2.5	0x30	0x37	+	0~F	0~F	0~F	0~F		
Temperature(BME280)	0x30	0x38	+:0x2b,-0x2d	0~F	0~F	.0x2e	0~F	0~F	
Humidity(BME280)	0x30	0x39	+	0~F	0~F				
Pressure(BME280)	0x30	0x41(A)	+	0~F	0~F	0~F	0~F		
Temperature(NTC)	0x30	0x42(B)	+:0x2b,-0x2d	0~F	0~F	.0x2e	0~F	0~F	
PM1.0	0x30	0x43(C)	+	0~F	0~F	0~F	0~F		
PM10	0x30	0x44(D)	+	0~F	0~F	0~F	0~F		
CH2O	0x30	0x45(E)	+	0~F	0~F	0~F	0~F		
VOC	0x30	0x46(F)	+	0~F	0~F	0~F	0~F		

9.2 Tag:

Lenth	Flag	BR/EDR(N/A)	Lenth	Manufacture Specific Data	Manufacture code	Becon Code		Tag Type	
0x02	0x01	0x04	0x1b	0xff(Self define)	0x59	0x00	0xAA	0xBC	0x01~0x03
Byte0	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7	Byte8	Byte9

MAC ID					Tag Battery	Button Status
Byte10	Byte11	Byte12	Byte13	Byte14	Hex(Divid by 10)	Push(0x01)/None(0x00)
Byte15	Byte16	Byte17				

Motion Status	Sensor Value							
Move(0x01)/Stay(0x00)	0x00	0x00	0x00	0x00	0x00			
Byte18	Byte19	Byte20	Byte21	Byte22	Byte23	Byte24	Byte25	Byte26

Reserved			
0x00	0x00	0x00	0x00
Byte27	Byte28	Byte29	Byte30

Sensor value:

ASCII Value	Byte 19	Byte 20	Byte 21	Byte 22	Byte 23	Byte 24	Byte 25	Byte 26	
Sesnor Name	D0	D1	D2(+/-)	D3	D4	D5	D6	D7	D8~D10
None	0X30	0X30							(Reserved)
Temperature(SHT-20)	0x30	0x31	+:0x2b,-0x2c	0~F	0~F	.0x2e	0~F	0~F	
Humidity(SHT-20)	0x30	0x32	+	0~F	0~F				
CO2	0x30	0x34	+	0~F	0~F	0~F	0~F		
CO	0x30	0x35	+	0~F	0~F	0~F	0~F		
PM2.5	0x30	0x37	+	0~F	0~F	0~F	0~F		
Temperature(BME280)	0x30	0x38	+:0x2b,-0x2c	0~F	0~F	.0x2e	0~F	0~F	
Humidity(BME280)	0x30	0x39	+	0~F	0~F				
Pressure(BME280)	0x30	0x41(A)	+	0~F	0~F	0~F	0~F		
Temperature(NTC)	0x30	0x42(B)	+:0x2b,-0x2c	0~F	0~F	.0x2e	0~F	0~F	
PM1.0	0x30	0x43(C)	+	0~F	0~F	0~F	0~F		
PM10	0x30	0x44(D)	+	0~F	0~F	0~F	0~F		
CH2O	0x30	0x45(E)	+	0~F	0~F	0~F	0~F		
VOC	0x30	0x46(F)	+	0~F	0~F	0~F	0~F		

Remark: All contents are subject to change without notice.



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