

IOT Sensor Gateway

Model: G-[Sensor]-[Temperature]-[I/O]



1. Features:

- Rich sensor options: Temperature, Humidity, PM2.5, CO, CO2, CH2O, VOC, pressure, RFID
- Internet or Cloud link via Wifi or Ethernet
- Support external I/O control interface, ex. PIR or Relay
- TCP server or Client
- AP or Station network
- Configurable auto report period
- Support RS-232, RS-485 (or Modbus RTU)
- Support DI/O

2. Applications:

- Smart home, Building automation
- Green house
- Environment monitoring
- Home, Factory, Warehouse Security
- Industrial automation
- Cloud

3. Model No. naming: G-[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: G-PM25-TH-DIO, G-THP, G-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(T_{90}) $\leq 60 S$
- 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: $T_{90}< 120 s$
- 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 (T_{90}): $\leq 60S$
- Repeatability: $< 2\%$ output value

- Zero drift (-20°C ~40°C): ≤0.2ppm
- Humidity Range: 15% ~90% RH
- Temperature Range: -20°C ~50°C
- Pressure range: normal atmosphere ± 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: ≤60mA
- Warm Up Time: ≤3 min
- Response Time: ≤20s
- Recovery Time: ≤60s
- Operating Temperature: 0~50°C
- Operating Humidity: ≤95%RH
- Storage Temperature: -20~60°C
- Sensitivity Attenuator: ≤1%/year

4.6 TH: (SENSIRON SHT-20)

- Humidity Accuracy: ±3 %RH
- Temperature Accuracy: ±0.3 °C
- Energy consumption: 3.2μW (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 (tau63%)

4.7 THP: (BOSH BME280)

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

4.8 NTC:

- Resistance at 25 degrees C: $10K \pm 1\%$
- $B_{25/50} = 3950 \pm 1\%$
- Thermal time constant ≤ 15 seconds
- Thermistor temperature range $-40\text{ }^{\circ}\text{C}$ to $200\text{ }^{\circ}\text{C}$
- Wire: 100cm, 28 AWG PVC
- Head: Stainless, $6 \times 30\text{mm}$

4.9 RFID:

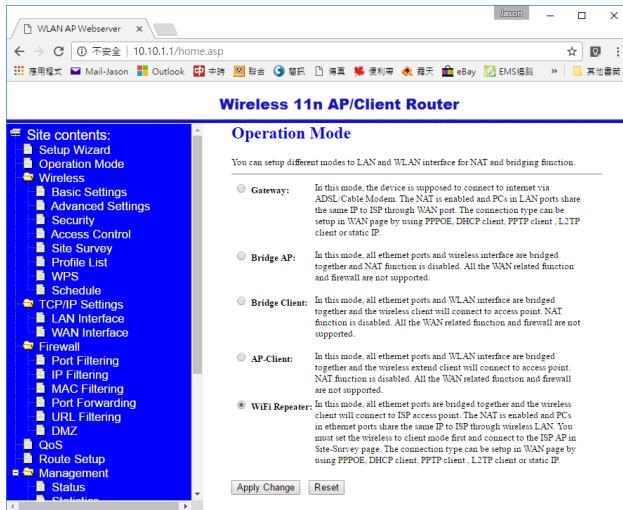
- Supports ISO/IEC 14443 A/MIFARE and NTAG
- Supports MF1xxS20, MF1xxS70 and MF1xxS50 encryption in Read/Write mode
- Sleep current: $< 80\mu\text{A}$
- Peak current: $< 30\text{mA}$
- Frequency: 13.56MHz
- Tag: mifare1 S50 、 mifare1 S70 、 mifare UltraLight 、 mifare Pro 、 mifare Desfire
- Working Temperature: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

5. Wifi/Ethernet

5.1 Specifications:

- IEEE 802.11 b/g/n standards compliant
- Frequency Range: 2.400 ~ 2.4835GHz
- Transmit Power(EIRP): 11n HT40 MCS7($+13\text{ dBm} \pm 1\text{ dBm}$), 11g OFDM ($+15\text{ dBm} \pm 1\text{ dBm}$), 11b CCK ($+18\text{ dBm} \pm 1\text{ dBm}$)
- Security: 64/128-bits WEP, TKIP, WPA, WPA2, AES
- Receiver Sensitivity: -66dBm at HT40 MCS7, -73dBm at 54Mbps, -86dBm at 11Mbps
- Multi-modes: AP/router/gateway/bridge/client
- Support WiFi repeater (AP-Client)
- Built-in web server configuration
- Operation Current: 200mA (Stand-by), 350mA (Normal)
- Networking (AP/router): DHCP Client/Relay/Server, Dynamic DNS, NTP Client, DNS Cache/Proxy, Firewall
- WiFi: 1T1R, 20MHz/40MHz bandwidth, Support multiple SSID & WPS
- CPU clock rate up to 400MHz
- 10/100 MHz RJ-45

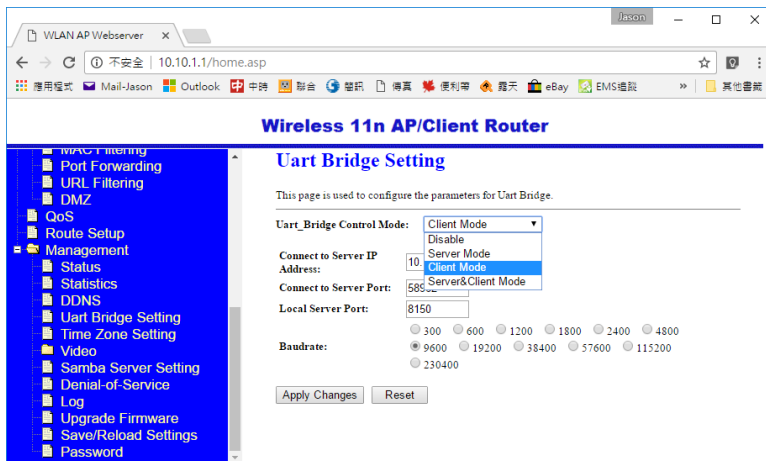
5.2 Configuration: Webpage, AP mode, IP: 10.10.1.1 (Default)



5.3 Security: Support Enterprise (RADIUS) WPA(2) encryption



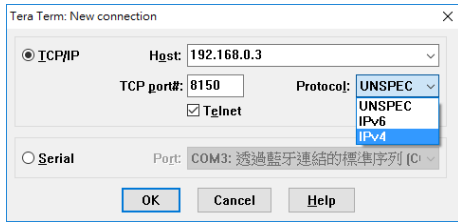
5.4 Support TCP Server & Client



6. Test software:

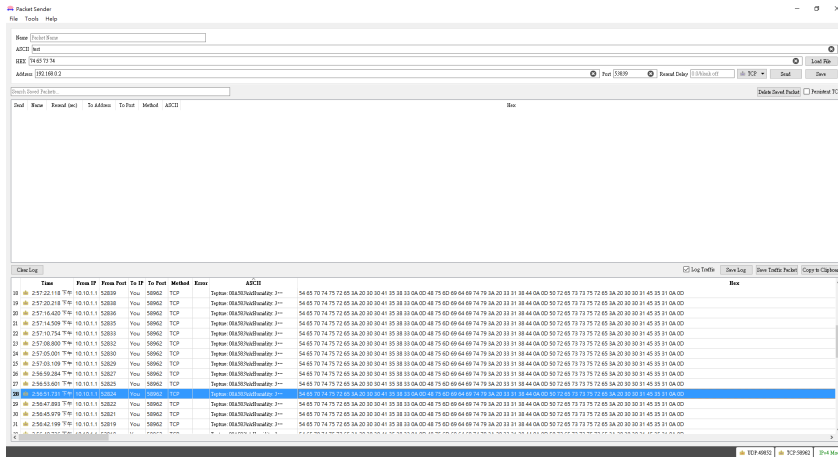
6.1 PC Terminal software: TCP client

Download: <https://tssh2.osdn.jp/>



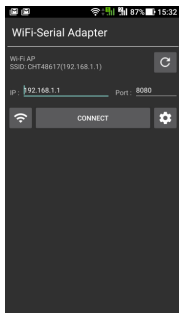
6.2 PC Terminal software: TCP server

Download: <https://packetsender.com/>



6.3 Android APP: TCP client

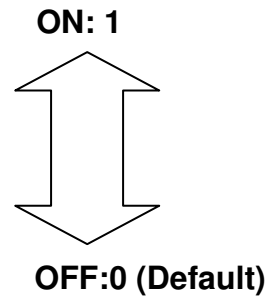
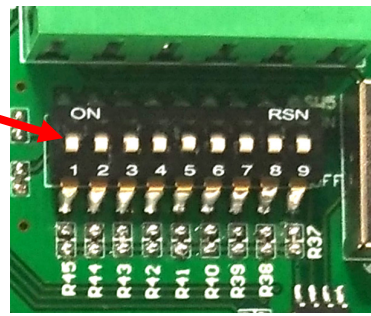
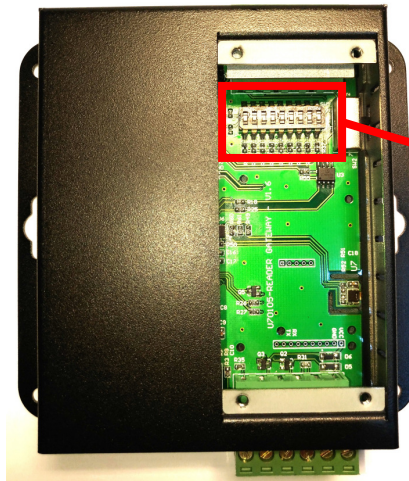
Download: https://play.google.com/store/apps/details?id=com.uconnect.uctcpipadapter_hex



7. Cloud: The cloud of the MQTT, Amazon, Google, IBM, Microsoft or etc. will be customized by the project, please contact the supplier.

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 Da	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

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

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

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,-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		

Remark: All contents are subject to change without notice.



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