

LoRaWAN CH4 Temperature and Humidity User Manual



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1. Overview

Based on LoRa[™] spread spectrum modulation technology, terminals are capable of ultra long distance communication. A wireless monitoring device that integrates data collection, monitoring, and transmission. This product is equipped with a methane (CH₄) sensor and a temperature and humidity sensor. The use of non dispersive infrared (NDIR) principle for detecting methane gas in the air has good selectivity and is oxygen independent. This sensor is equipped with emergency reporting of data anomalies, and can proactively report anomalies based on pre-set threshold values according to the on-site environment. It supports standard LoRaWAN protocol and TDMA networking protocol for ad hoc networks.

Power Supply	5~28VDC
Weight	120g
Operating Emperature	-20℃~60℃
Measuring Principle	Principle of Non Dispersive Infrared (NDIR)
	CH4:0 ~ 100% LEL
Measuring Range	Temp:-40~+80 ℃
	Humi:0~99.9 %RH
Resolution Ratio	CH4:1%LEL
Lifespan	> 5 years
Frequency	CN470/IN865/EU868/RU864/US915/AU915/ KR920/AS923-1&2&3&4
Mode	OTAA Class A/C(Default: Class C)
Reporting cycle	External power supply:10min(Default reporting cycle)
Communication Protocol	LoRaWAN,LoRa TDMA Networking

2. Technical Parameters

Website: <u>http://www.zonewu.com</u> E-mail: <u>qui@zonewu.com</u>



	AppEUI: 000000000000000000000000000000000000
Equipment information	DevEUI: aaaa202404150001
(Reference)	AppKey: 000011112222333344445555666667777
	MAC Version: LoRaWAN 1.0.3

2.1 Product List

- LoRaWAN CH₄ Temperature and Humidity Sensor 1 piece
- TYPE-C data cable 1 piece



3. Configuration and Installation

3.1 LW302 Interface Description



1. **TYPE-C Interface:**

Used for device serial port configuration. It can also serve as a power supply interface.

2. **Temperature and humidity sensor probe:** Used for monitoring environmental temperature and humidity values

3. DC Power Interface:

DC5.5 * 2.1 female socket, power supply interface, DC5-28V.

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3.2 LW302 Parameter Configuration Instructions

Configuration preparation:

- USB Type-C data cable
- Computer (Windows system)
- Configuration Tool Toolbox

Download: http://www.zonewu.com/en/Configuration-Tools.html

1. Install serial port driver program.CH340 USB to serial port .

2. Connect the LW101 to the PC using a USB cable and check if there is a COM port. If not, please recheck the equipment wiring and driver installation.

3. Open the configuration tool LoRa_config SLoRa_config V1.0.0 .open the corresponding COM port .

Port default parameters:

BaudRate	115200bit/s
Parity	None
DataBits	8
StopBits	1

As follows:

LoRa_Con	fig V1.0.0								8000		×
Calculate	or Contact	Us Upgrade									
Port C	om17 \sim	Version					✓ Timestamp	⊖ Hex	SCII	SAVE	
BaudRate 1	15200 ~	DEVSNNM				LOGLVL	~				
Parity N	one 🗸 🗸	LoRa In	terface Config								
DataBits 8	×.	LoRaWA	N								
StopBits 1	~		DEVEUI								
	关闭串口		APPEUI								
			APPKEY								
		FF	REQBANDMASK		CONFIRM	~					
Enter	Load	1	ULDLMODE	~	ADR	~					
COULTR	r ar ans		JOINMODE	~	MODE	~					
Restore Factory	Write Params	Params									
Reboot	Frit	1)	Reporting Cycle	s							
Device											
	Sending										-

4. 1.Enter Config → 2.Load Params → 3.LoRaWAN → 4.Write Params → 5.Reboot Device



LoRa_Confi	ig V1.0.0							1944		×
Calculato	r Contact	Us <mark>Upg</mark> r	ade							
Port CO	M17 ~	Versio	n				Timestamp () Hex	() ASCIT	SAVE	
BaudRate 11	5200 ~	DEVSNN	IM			LOGLVL		0		
Parity No	ne v	LoRa	Interface Config		3		-			Ŷ
DataBits 8	~	LoRa	WAN							
StopBits 1	~		DEVEUI							
	关闭串口		APPEUI							
			APPKEY							
1	2		FREQBANDMASK		CONFIRM	~				
Enter Config	Load Parans		ULDLMODE	~	ADR	~				
			JOINMODE	~	MODE	~				
Restore Factory	Vrite Parans	4 Parar	ns							
Reboot Device	Exit		Reporting Cycle	S						
5										
	Sending									Ų

LoR	aWAN				
	DEVEUI	BF01240726D00001			
	APPEUI	331341E186891989			
	APPKEY	5572404c696e6b4c6f	52613230313	823	
	FREQBANDMASK	0002	CONFIRM	Close ACK	~
	ULDLMODE	Abnormal Freq Mo ~	ADR	Close	~
			MODE	ClassC	~
Para	ams				
	Reporting Cycle	600 s			

LoRaWAN Interface:

Item	Describe	Notes
DevEUI	Node's globally unique identifier code	64bit
AppEUI	Node's application identifier code	64bit
АррКеу	Assigned to the terminal by the application owner.	128bit



FREQBANDMASK	Set frequency group mask	
	Set up uplink and downlink same frequency but	
ULDLMODE	different frequency	
CONFIRM	Set uplink transmission type	
ADR	Set adaptive speed	
MODE	Set device working mode	

The device will be configured with ternary parameters by default when it leaves the factory:

DevEUI: BF01240726D00001

AppEUI: 331341E186891989

AppKey: 5572404c696e6b4c6f52613230313823

NOTE: All sensors are shipped with AppEUI and AppKey default to

331341E186891989 and 5572404c696e6b4c6f526132330313823.

Users can customize according to their own applications

FREQBANDMASK: The frequency group mask for LoRaWAN operation, with 16 bits corresponding to 16 frequency groups. Default is 0001.Users need to configure it according to the actual application region.

Params Interface:

Item	Describe	Notes
Reporting cycle	adjustable range 1-65535, default is 600s (10min)	

Printing logs of device startup and network connection:

CoRa_0	Config V1.0.0							-		×
The Calcul	ator Conta	ct Us Upgrade	•							
Port	COM17	Version	ZW_LW100_W2.0_0_Pri	ivate_RS_V2.0.0_			🗹 Timestamp 🔿 Hex 🛛	• ASCII	SAVE	
BaudRate	115200	DEVSNNM	00380049350000054E5	574E52	LOGLV	L 2 ~	[2024/7/31 10+32+39]	- المار Werei	on:	
Parity	None	- LoRa In	nterface Config				+CGMR=release/V4.18_F CN470	21.4.2 LoRa	WAN for	
DataBits	8	LoRaWA	AN				ok			
StopBits			DEVEUI BF01	1240726D00001			ASR6601:~# MT DevEui Set ok! MT AppEui Set ok!			
	шлњц	-	APPEUI 3313 APPKEY 5572	341E186891989 2404c696e6b4c6f52613;	230313823		[2024/7/31 10:32:40] ok! MT Class Set ok! MT ChannelWask Set ok	Чұ<- МТ Ар	pKey Set	
Entor	Load	F	REQBANDMASK 0002	2 CON	ADR Close		MT Confirm Set ok! MT UlDlMode Set ok! MT adr Set ok!			
Config	Parans		1.Indicates	s tha the device	MODE ClassC		[2024/7/31 10:32:40] [2024/7/31 10:32:41]	收<- MT jo 收<- Regi	in start Cnt:1	
Factor	e Viite y Params	Params	added to t	he network		-	[2024/7/31 10:32:42] [2024/7/31 10:32:43]	収<- Regi 収<- Regi	Cnt:2 Cnt:3	
Reboot Device	Exit		Reporting Cycle 6	00 sec			[2024/7/31 10:32:44] [2024/7/31 10:32:45]	收<- Regi 收<- Regi	Cnt:4 Cnt:5	
		2 Tho d		fully added to	the network		[2024/7/31 10:32:46]	收<- Join	OK	ר
		z.me di	evice is success	sing added to	the network -		[2024/7/31 10:32:47] MT Tx ok!	4∑<- data	Report	
	Sending	:								~

The device is equipped with a built-in LED indicator light, which is located next



to the antenna interface and can be seen as a green light through the casing.

LED	Status	Describe
Croop indiactor light	Flicker	Add to the network
	Light	Successfully added to the network

Firmware upgrade:

BaudRate 1	45000			,11 DHVD
	115200 ~	DEVSNNM	Q Upgrade – 🗆 X	~
Parity N	Vone ~	LoRa Interface Config	N	
DataBits 8	3 ~	LoRaWAN	Browse	
StopBits 1	1 ~	DEVEUI	Port COM20 V Packet length 4096 V	
	Open	APPEUI	BaudRate 115200 ~	
		APPKEY	Open Upgrade	
		FREQBANDMASK	Ready	
Enter	Load	ULDLMODE		
			MODE	
Restore Factory	Vrite Params	Params		
Reboot Device	Exit	Reporting Cycle	sec	
Restore Factory Reboot Device	Write Params Exit	Params Reporting Cycle	sec	

Click to upgrade \rightarrow Pop up upgrade window

rowse	C:\Users\Admini	strator	Desktop	\lora\
Port	C0M20 ~	Packet	length	4096
BaudRate	115200 ~	ſ		
	Open		Upgr	ade
Ready				



🚭 Upgrade	22	_25		×
Browse C:\Users\Admi	nistrator	\Des]	<top\lor< td=""><td>ra\LW1</td></top\lor<>	ra\LW1
Port COM17	🗸 🛹 acke	t ler	ngth 40	96 🗸
BaudRate 115200	2.9	sele	ect t	he
Close	CO	U F	port	le
Please click to	J ungrade			
Upgrade	12	- 65		X
Browse C:\Users\Admin	nistrato	r\Des	ktop\la	ora\LW1
2			alial	1
Port COM17 5.00	Packe	r_1	hgth 4	9 6 ~
Upq	rade			
BaudRate 115200		-		
Close		U	pgrad	ae
	-			
TD 4				
Please click to	upgrad	9		
Please click to	upgrad	€		

_				
Browse	C:\Users\Administ	trator\Des	ktop\lor	·a/LW
Port BaudRat	4.reset the	Packet ler	r sup	96 pply
_	Close	U	ograd	e
	1			





If there is an upgrade error during the upgrade process, you can close and reopen the upgrade window and follow the instructions to upgrade again.



3.3 LW302 Size and Installation



Product size



INSTALLATION INSTRUCTIONS



Installation instructions



4. Protocol Description

4.1 Data Format

The up/down data of the device is based on hexadecimal format. High position in front, low position in back.

address	code	length	data		
1 byte	1 byte	1 byte	2 byte	2 byte	2 byte

4.2 Upward Data

The device information is reported once during network access or restart.

Sensor	Instruction	Data	a Data		Data	
address	type	Length	CH₄	Temp.	Humi.	
01	02	06	000C	0109	0207	
1	2	6	12	26.5 ℃	51.9	

Note:

1.If the received data is FFFF FFFF, it indicates that the sensor is not connected or the sensor is abnormal.

2.When the temperature is below 0 $^{\circ}$ C, The temperature data is uploaded in the form of a supplementary code.

Temperature: FF9B H (hexadecimal)= -101=>Temperature= -10.1 °C

4.2.1 Register Address Description

Register address	0001H	0002H	0003H
Parameter	CH ₄	Temperature	humidity
Unit	LEL	°C	%
Range	0-100%LEL	-40~+80 ℃	0~99.9 %RH
Data Type	uint16	int16	uint16
Sample Value	-	/10	/10
Operate	Read	Read	Read



4.3 Downward data

Support configuring devices through downstream commands. When the downlink command is in confirmation packet mode, the device will immediately send a reply packet after executing the command.

4.3.1 Restart the device

Starting byte	Instruction type	Trail byte
(1byte)	(1byte)	(1byte)
0xFE	01	0xEF

Response:

Starting byte	Instruction type	Trail byte
(1byte)	(1byte)	(1byte)
0xEF	01	0xFE

4.3.2 Set Reporting cycle

Starting byte	Instruction type	Reporting cycle	Trail byte
(1byte)	(lbyte)	(2byte)	(lbyte)
0xFE	02	Х	0xEF

Response:

Starting byte	Instruction	Reporting	Trail byte
(1byte)	type(1byte)	cycle(2byte)	(1byte)
0xEF	02	Х	0xFE