Temperature Humidity Sensor

Engineering Specification

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1 Overview

The Temperature Humidity Sensor measures the three air quality parameters temperature, humidity and dew point and reports them to a central controller. Besides this, the device can directly control groups of other Z-Wave™ devices on over- and undershooting a set temperature and/or humidity parameter.This can be used to establish control loops for temperature and humidity.

This product supports Security 2 Command Class. While a Security S2 enabled Controller is needed in order to fully use the security feature. This product can be operated in any Z-Wave network with other Z-Wave certified devices from other manufacturers. All mains operated nodes within the network will act as repeaters regardless of vendor to increase reliability of the network.

This product supports SmartStart. SmartStart enabled products can be added into a Z-Wave network by scanning the Z-Wave QR Code present on the product with a controller providing SmartStart inclusion. No further action is required and the SmartStart product will be added automatically within 10 minutes after this product being powered on in the network vicinity.

2 Specifications

2.1 Structural Characteristics

Parameter	Value
Product Identifier	ZW027
Dimensions	34x34x16 mm
Color	White
IP Class	IP 20
Usage	Indoor

2.2 Hardware Characteristics

Parameter	Value
Z-Wave Module	ZGM130S
Z-Wave TX Power	Max:13dBm
Z-Wave Antenna Distance	40m(Indoor)/150m(outdoor)
Indicator Light	2 red ,2 green
Battery Type	1*CR2477
Work Current	15mA(wake up), 20mA(Semd message)
Standby Current	4uA

2.3 Software Characteristics

Parameter	Value
Wireless Technology	Z-Wave
Z-Wave Plus™	Z-Wave Plus V2
Z-Wave Version	7.15.1
Z-Wave Device Type	Notification Sensor
Z-Wave Role Type	ZWAVEPLUS_INFO_REPORT_ROLE_TYPE_SLAVE_SLEEPING_REPORTING(0x06)
Generic Device Type	GENERIC_TYPE_SENSOR_NOTIFICATION(0x07)
Specific Device Type	SPECIFIC_TYPE_NOTIFICATION_SENSOR(0x01)
Security Class	Non-Security, S0, S2 Unauthenticated, and S2 Authenticated
SmartStart Compatible	Support. After powering on, SmartStart is auto activated.
Over The Air (OTA)	Support. Firmware can be updated via RF.
Multi Channel Device	No
Association	Support. Refer to Section 4.6 Association Group Info.
Factory Reset	Support. Refer to Section 3.3 How to factory reset.
Power-down Memory	Support. All command settings will stay unchanged even power down.
Low Battery warning	Support.

3 Quick Start

3.1 How to add the product

The following will step you through adding the product to your Z-Wave network.

Note:

When powered, the product will indicate Z-Wave status with the LED:

- **Red LED blink 5 seconds and then off** - the product is not added to any Z-Wave network.
- **Green LED light on 1 second** - the product is already added to the Z-Wave network.

3.1.1 Classic inclusion

1. Power the product.

2. Place your gateway or controller into Z-Wave pair or inclusion mode. (Please refer to your controller/gateway manual on how to do this).

3. Click button 3x times within 1 second. Red and Green LED slow blink which indicates entering inclusion mode, and Node Info will be issued for adding.

4. If your controller supports S2 security, and you want to add the product into S2 Authenticated network, please scan the QR code or enter the PIN code (the underlined 5-digits of the DSK) when prompted. ***[IMPORTANT] QR/PIN code can be found on the product. A full DSK string can be found on the packaging.***

5. Wait for the adding process to end.

6. Confirm the adding result. Successful adding will be confirmed by the Z-Wave controller's message or LED status. If adding is successful, Green LED will light stays on 2 seconds and then off. If its Red LED light stays on 2 seconds and then off ,it indicates adding is unsuccessful. The product will auto-reset and then activate SmartStart. Repeat the above steps or contact us for further support if needed.

Note:

The classic manually inclusion will exit if click button once during the adding process. Its Red LED will light stays on 2 seconds and then off. The product will auto-reset and activate SmartStart.

3.1.2 SmartStart

1. Scan the Z-Wave QR Code present on the product with a controller providing SmartStart inclusion. No further action is required and the product will be added automatically within 10 minutes after this product being powered on in the network vicinity.

2. Red and Green LED will fast blink after your controller beginning to respond to its SmartStart inclusion request.

3. Confirm the adding result. Successful adding will be confirmed by the Z-Wave controller's message or LED status. If adding is successful, Green LED will light stays on 2 seconds and then off. If its Red LED light stays on 2 seconds and then off ,it indicates adding is unsuccessful. The product will auto-reset and then activate SmartStart. Repeat the above steps or contact us for further support if needed.

3.2 How to remove the product

1. Make sure the product is powered.

2. Place your gateway or controller into Z-Wave pair or exclusion mode. (Please refer to your controller/gateway manual on how to do this).

3. Click button 3x times within 1 second. Red and Green LED slow blink which indicates entering exclusion mode.

4. Wait for the removing process to end.

5. Confirm the removing result. Successful removing will be confirmed by the Z-Wave controller's message or LED status. If removing is successful, Green LED will light stays on 2 seconds and then off. If its Red LED light stays on 2 seconds and then off ,it indicates removing is unsuccessful.

3.3 How to factory reset

Reset procedure allows to restore the product back to its factory settings, which means all information about the Z-Wave controller and user configuration will be deleted.

1. Make sure the product is powered.

2. Press and hold the button for at least 10s, and then Factory Reset is performed. The product will issue a Device Reset Locally Command via its Lifeline to notify the Lifeline destination that the product has been reset to its factory default state. And it will perform the reset operation regardless of whether or not the delivery of the Device Reset Locally Notification is successful.

Note:

If you press and hold the button, 5 to 10 seconds, the Green LED will slow flash,and then Green LED light 2 senconds until the factory settings are restored.

Resetting the product is not the recommended way of removing the product from the Z-Wave network. Use reset procedure only if the primary controller is missing or inoperable. Certain product removal can be achieved by the procedure of removing described in “How to remove the product”.

4 Software Function Definition

4.1 Supported Command Classes

In order to increase interoperability with legacy controlling nodes, this device can reply to Manufacturer Specific Get Commands received non-securely if it was granted the S0 network key as its highest Security Class.

Command Class	Version	Not added	Non-secure added	S0 Securely added		S2 Securely added	
				Non-secure CC	Secure CC	Non-secure CC	Secure CC
ZWAVEPLUS_INFO	2	Support	Support	Support		Support	
ASSOCIATION	2	Support	Support		Support		Support
MULTI_CHANNEL_ASSOCIATION	3	Support	Support		Support		Support
ASSOCIATION_GROUP_INFO	3	Support	Support		Support		Support
TRANSPORT_SERVICE	2	Support	Support	Support		Support	
VERSION	3	Support	Support		Support		Support
MANUFACTURER_SPECIFIC	2	Support	Support		Support		Support
DEVICE_RESET_LOCALLY	1	Support	Support		Support		Support
INDICATOR	3	Support	Support		Support		Support
POWERLEVEL	1	Support	Support		Support		Support
BATTERY	1	Support	Support		Support		Support
SENSOR_BINARY	2	Support	Support		Support		Support
CONFIGURATION	4	Support	Support		Support		Support
SECURITY	1	Support	Support	Support		Support	
SECURITY_2	1	Support	Support	Support		Support	
NOTIFICATION	8	Support	Support		Support		Support
WAKE_UP	2	Support	Support		Support		Support
SUPERVISION	1	Support	Support	Support		Support	
FIRMWARE_UPDATE_MD	5	Support	Support		Support		Support
MULTILEVEL SENSER	11	Support	Support		Support		

4.2 Basic Command Class mapping

No commands for mapping.

4.3 Z-Wave Plus Info

Parameter	Value
Z-Wave Plus Version	2
Role Type	6 (ZWAVEPLUS_INFO_REPORT_ROLE_TYPE_SLAVE_SLEEPING_REPORTING)
Node Type	0 (ZWAVEPLUS_INFO_REPORT_NODE_TYPE_ZWAVEPLUS_NODE)

Installer Icon Type	0x0C00 (ICON_TYPE_GENERIC_SENSOR_NOTIFICATION)
User Icon Type	0x0C10 (ICON_TYPE_SPECIFIC_SENSOR_NOTIFICATION_WEATHER_ALARM)

4.4 Manufacturer Specific

Parameter	Value
Manufacturer ID 1	0x03
Manufacturer ID 2	0x71
Product Type ID 1	0x00(EU), 0x01(US), 0x02(AU)
Product Type ID 2	0x02(PRODUCT_TYPE_ID_SENSOR)
Product ID 1	0x00
Product ID 2	0x09

4.5 Version

Parameter	Value
Z-Wave Protocol Library Type	0x03
Z-Wave Protocol Version	0x07
Z-Wave Protocol Sub Version	0x15
Firmware 0 Version	0x02
Firmware 0 Sub Version	0x00
Hardware Version	0x01
Number of firmware targets	0x00

4.6 Association Group Info

Root device

ID	Name	Node count	Profile	Function
1	Lifeline	5	General: Lifeline (0x0001)	**Device Reset Locally Notification:** Issued when Factory Reset is performed. **Battery Report** Issued when the battery power changes by more than 10%. **Sensor Binary Report** Issued when Mould danger alarm. **Multilevel Sensor Report** Issued when button pressed to wake up or auto report enable or detect temperature/humidity change exceeds the set value. **Notification Report** Details see 4.7.
2	Temperature High Trigger	5	General: Notification (0x7104)	**Basic Set** Issured when the temperature detected is higher than set value by Configuration parameter 5.
3	Temperature Low Trigger	5	General: Notification (0x7104)	**Basic Set** Issured when the temperature detected is lower than set value by Configuration parameter 6.
4	Humidity High Trigger	5	General: Notification (0x7110)	**Basic Set** Issured when the humidity detected is higher than set value by Configuration parameter 7.
5	Humidity Low Trigger	5	General: Notification (0x7110)	**Basic Set** Issured when the humidity detected is lower than set value by Configuration parameter 8.
6	Air Temperature	5	General: Sensor(0x3101)	**Multilevel Sensor Report** Sensor type = Temperature Issured when nodes are associated in Association Group 6.

4.7 Notification

Notification Type		Notification Events		Description
Heat Alarm	0x04	State Idle	0x00	Issured when overheat or underheat alram removed.
		Overheat detected	0x02	Issured when detect temperature is higher than set value by Configuration parameter 5.
		Underheat detected	0x06	Issured when detect temperature is lower than set value by Configuration parameter 6.
Power Management	0x08	State Idle	0x00	Issured when replace new battery that battery power more than 90%.
		Replace battery now	0x0B	Issued when the battery power lower than 20%.
Weather Alarm	0x10	State Idle	0x00	Issured when Moisture Alarm removed.
		Moisture Alarm	0x02	Issured when detect humidity is higher than 70% plus set value by Configuration param 13.

4.8 Wake Up

Parameter	Value	Time
Min Wake Up Interval Seconds	0x000E10	3600 seconds
Max Wake Up Interval Seconds	0xEFF100	182 days
Default Wake Up Interval Seconds	0x093A80	7 days
Wake Up Interval Step Seconds	0x0000F0	240 seconds

4.9 Multilevel Sensor

Sensor Type		Support Scale	Measure Range
Temperature	0x01	Celcius (C)	-10 to 65°C (+- 1°C)
		Fahrenheit (F)	14 to 146°F (+- 1.8°F)
Relative Humidity	0x05	Percentage value (%)	0 to 80% RH +- 3%
Dew Point Temperature	0x0B	Celcius (C)	-10 to 65°C (+- 1°C)
		Fahrenheit (F)	14 to 146°F (+- 1.8°F)

4.10 Configuration

Parameter	0x01 (1)			
Name	Minimum temperature change to report			
Info	Trigger temperature report to lifeline.			
Properties	Size	1	Min Value	0
	Format	Unsigned Integer	Max Value	100
	Read-only	False	Default Value	20
	Altering capabilities	False	Advanced	False
Description	The check interval time is set by configuration parameter 3.			
	Value	Function		

	0	Disable
	1~100	0.1~10 degree

Parameter	0x02 (2)			
Name	Minimum humidity change to report			
Info	Trigger humidity report to lifeline.			
Properties	Size	1	Min Value	0
	Format	Unsigned Integer	Max Value	20
	Read-only	False	Default Value	5
	Altering capabilities	False	Advanced	False
Description	The check interval time is set by configuration parameter 3.			
	Value	Function		
	0	Disable		
	1~20	1-20%		

Parameter	0x03 (3)			
Name	Check interval for parameter 1 and 2			
Info	Set the interval time			
Properties	Size	1	Min Value	1
	Format	Unsigned Integer	Max Value	255
	Read-only	False	Default Value	15
	Altering capabilities	False	Advanced	False
Description				
	Value	Function		
	1~255	1~255 minutes		

Parameter	0x04 (4)			
Name	Periodic Reports			
Info	Set the time to send unsolicited report.			
Properties	Size	2	Min Value	0
	Format	Unsigned Integer	Max Value	65535
	Read-only	False	Default Value	43200
	Altering capabilities	False	Advanced	False
Description				
	Value	Function		
	0	Disable		
	30~65535	Seconds		

Parameter	0x05 (5)
Name	Temperature Upper Watermark value
Info	Surpasses value send BASIC Set to Group2.

Properties	Size	2	Min Value	0
	Format	Unsigned Integer	Max Value	1000
	Read-only	False	Default Value	0
	Altering capabilities	False	Advanced	False
Description				

Value	Function
0	Disable
1~1000	0.1~100 degree

Parameter	0x06 (6)			
Name	Temperature Lower Watermark value			
Info	Below value send BASIC Set to Group3.			
Properties	Size	2	Min Value	-200
	Format	Signed Integer	Max Value	1000
	Read-only	False	Default Value	0
	Altering capabilities	False	Advanced	False
Description				

Value	Function
0	Disable
-200~1000	-20~+100 degree

Parameter	0x07 (7)			
Name	Humidity Upper Watermark value			
Info	Surpasses value send BASIC Set to Group4			
Properties	Size	1	Min Value	0
	Format	Unsigned Integer	Max Value	90
	Read-only	False	Default Value	0
	Altering capabilities	False	Advanced	False
Description				

Value	Function
0	Disable
1~90	1%~90%

Parameter	0x08 (8)			
Name	Humidity Lower Watermark value			
Info	Below value send BASIC Set to Group5.			
Properties	Size	1	Min Value	0
	Format	Unsigned Integer	Max Value	90
	Read-only	False	Default Value	0
	Altering capabilities	False	Advanced	False

Description		
	Value	Function
	0	Disable
	1~90	1%~90%

Parameter	0x09 (9)			
Name	Low Temperature Trigger BASIC Set Send			
Info	Set BASIC Set value send to Group3.			
Properties	Size	1	Min Value	0
	Format	Unsigned Integer	Max Value	255
	Read-only	False	Default Value	255
	Altering capabilities	False	Advanced	False
Description				
	Value	Function		
	0~255	Basic Set Value		

Parameter	0x0A (10)			
Name	High Temperature Trigger BASIC Set Send			
Info	Set BASIC Set value send to Group2.			
Properties	Size	1	Min Value	0
	Format	Unsigned Integer	Max Value	255
	Read-only	False	Default Value	0
	Altering capabilities	False	Advanced	False
Description				
	Value	Function		
	0~255	Basic Set Value		

Parameter	0x0B (11)			
Name	Low Humidity Trigger BASIC Set Send			
Info	Set BASIC Set value send to Group5.			
Properties	Size	1	Min Value	0
	Format	Unsigned Integer	Max Value	255
	Read-only	False	Default Value	255
	Altering capabilities	False	Advanced	False
Description				
	Value	Function		
	0~255	Basic Set Value		

Parameter	0x0C (12)
Name	High Humidity Trigger BASIC Set Send
Info	Set BASIC Set value send to Group4.

Properties	Size	1	Min Value	0
	Format	Unsigned Integer	Max Value	255
	Read-only	Fasle	Default Value	0
	Altering capabilities	Fasle	Advanced	Fasle
Description				
	Value	Function		
	0~255	Basic Set Value		

Parameter	0x0D (13)			
Name	Offset value for Mould danger alarm			
Info	Increase the humidity threshold.			
Properties	Size	1	Min Value	0
	Format	Unsigned Integer	Max Value	10
	Read-only	False	Default Value	0
	Altering capabilities	False	Advanced	False
Description	The default Relative Humidity to trigger Mould dangter alram is 70%.			
	Value	Function		
	0-10	0%-10%		

Parameter	0x0E (14)			
Name	Offset value for Temperature			
Info	Calibrate temperature when checked			
Properties	Size	2	Min Value	-200
	Format	Unsigned Integer	Max Value	200
	Read-only	False	Default Value	0
	Altering capabilities	False	Advanced	False
Description	Scale is defined by Param 64.eg: Value 15 means 1.5°C or 1.5F			
	Value	Function		
	-200~200	-20~20 degrees		

Parameter	0x0F (15)			
Name	Offset value for Humidity			
Info	Calibrate humidity when checked			
Properties	Size	1	Min Value	-50
	Format	Unsigned Integer	Max Value	50
	Read-only	False	Default Value	0
	Altering capabilities	False	Advanced	False
Description				
	Value	Function		
	-50~50	-50~50%		

Parameter	0x10 (16)			
Name	Check interval for parameter 5,6,7 and 8			
Info	Set the interval time			
Properties	Size	1	Min Value	1

	Format	Unsigned Integer	Max Value	255
	Read-only	False	Default Value	15
	Altering capabilities	False	Advanced	False
Description				
	Value	Function		
	1~255	1~255 minutes		

Parameter	0x40 (64)			
Name	Temperature Scale			
Info	Set the temperature scale.			
Properties	Size	1	Min Value	1
	Format	Enumerated	Max Value	2
	Read-only	False	Default Value	1(EU)/2(US)
	Altering capabilities	False	Advanced	False
Description				
	Value	Function		
	1	Celsius		
	2	Fahrenheit		

Parameter	0x41 (65)			
Name	Report after include network			
Info	Enable or disable report			
Properties	Size	1	Min Value	0
	Format	Bit field	Max Value	15
	Read-only	False	Default Value	0
	Altering capabilities	False	Advanced	False
Description				
	Value	Function		
	Bit0	Enable or disable battery report		
	Bit1	Enable or disable MULTILEVEL SENSOR REPORT Sensor Type= Temperature		
	Bit2	Enable or disable MULTILEVEL SENSOR REPORT Sensor Type= Humidity		
	Bit3	Enable or disable MULTILEVEL SENSOR REPORT Sensor Type= Dew point		

Parameter	0xFF (255)			
Name	Reset Parameter			
Info	Reset device to factory defaults.			
Properties	Size	4	Min Value	0
	Format	Unsigned Integer	Max Value	4294967295
	Read-only	False	Default Value	0
	Altering capabilities	False	Advanced	False
Description				
	Value	Function		
	0	-		

	1431655765	Factory Reset the product and remove it from the network.
	other	Reset Configuration Parameter to factory setting.

FCC Caution.
a. 15.19 Labeling requirements.
This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation
b.15.21 Changes or modification warning.
Any Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.
c. 15.105 Information to the user.
Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation.
If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:
-Reorient or relocate the receiving antenna.
-Increase the separation between the equipment and receiver.
-Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
-Consult the dealer or an experienced radio/TV technician for help.