

Refrigerator Multi-Sensor PAT13 -A/B/C/D



The refrigerator temperature sensor PAT13 has temperature and door/window , 2 sensors function in one, based on Z-Wave™ technology.

It is the Z-Wave™ plus product, it support the security, OTA... Those newest features of the Z-Wave™ technology. Z-Wave™ is a wireless communication protocol designed for home automation, specifically to remotely control applications in residential and light commercial environments. The technology uses a low-power RF radio embedded or retrofitted into home electronics devices and systems, such as lighting, home access control, entertainment systems and household appliances.

This product can be included and operated in any Z-Wave™ network

with other Z-Wave™ certified devices from other manufacturers and/or other applications. All non-battery operated nodes within the network will act as repeaters regardless of vendor to increase reliability of the network.

The device adopt the Z-Wave™ 500 series chip, when your Z-Wave™ network system is all made by Z-Wave™ 500 series devices. The network system will have the advantages as below.

- Concurrent multi-channel support reduces external interference.
- Better RF range, improve about 10 meters in indoor.
- Support 100 Kbps transmit speed, speed up communication.

Specification

Rated	DC3V (CR123A)
RF distance	Min. 40M indoor, 100M outdoor line of sight,
RF Frequency	868.40 MHz, 869.85 MHz(EU) 908.40 MHz, 916.00 MHz(US) 920.9MHz, 921.7MHz, 923.1MHz(TW/SG/Thai/KR)
RF Maximum Power	+10dBm (Peak), -10dBm (Average)
Dimension	85(L)x 28(W)x23(H) mm
Weight	80g
IP classification	IP20; indoor use
Operation temperature	-10 to 40° C
Humidity	85%RH max
Magnetic gap	25mm (open to close); 30mm (close to open)
Temperature Detect Range	-30 to 80°C
Cable type	28AWGx 4C OD: 3.0mm, 2 meters, -40 to 80 °C

✧ Specifications are subject to change and improvement without notice.

Troubleshooting

Symptom	Cause of Failure	Recommendation
The device can not join to Z-Wave™ network	The device may in a Z-Wave™ network.	Exclude the device then include again.

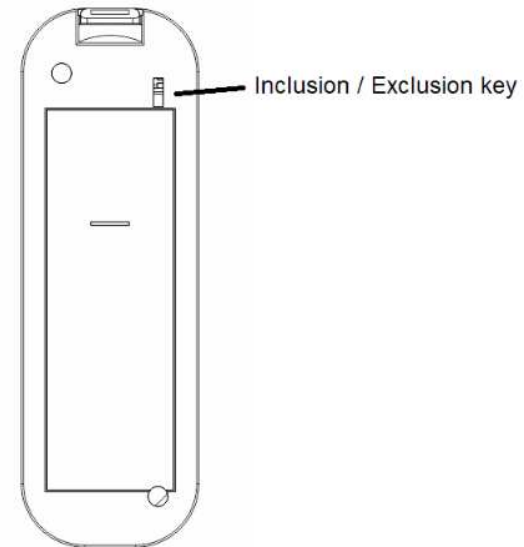
For Instruction to [http:// www.philio-tech.com](http://www.philio-tech.com)



Function Compare A/B/ C/D

	Door/Window	Temperature	Temperature Sensing Accuracy
PAT13-A	V	V	±0.3
PAT13-B		V	±0.3
PAT13-C	V	V	±0.4
PAT13-D		V	±0.4

Overview



Add to/Remove from Z-Wave™ Network

There are one tamper keys in the back side of the device, It can add, remove, reset or association from the Z-Wave™ network.

In the first time, add the device into the Z-Wave™ network. First, make sure the primary controller is in the add mode. And then power on the device, just take out the insulation Mylar in the back side of the device. The device will auto start SmartStart mode. You should key in first five digit to increment SmartStart process,or you can scan QR code. And if it included, You will see the LED light ON one second.

Notice: Including a node ID allocated by Z-Wave™ Controller means “**Add**” or “**Inclusion**”. Excluding a node ID allocated by Z-Wave™ Controller means “**Remove**” or “**Exclusion**”.

Function	Description
Add	<ol style="list-style-type: none"> 1. Have Z-Wave™ Controller entered inclusion mode. 2. Pressing the tamper key three times within 1.5 seconds to enter the inclusion mode. 3. After add successful, the device will wake to receive the setting command from Z-Wave™ Controller about 20 seconds.
Remove	<ol style="list-style-type: none"> 1. Have Z-Wave™ Controller entered exclusion mode. 2. Pressing tamper key three times within 1.5 seconds to enter the exclusion mode. Node ID has been excluded.
Reset	<p><i>Notice: Use this procedure only in the event that the primary controller is lost or otherwise inoperable.</i></p> <ol style="list-style-type: none"> 1. Pressing tamper key four times within 1.5 seconds and do not release the tamper key in the 4th pressed, and the LED will light ON.

	<ol style="list-style-type: none"> 2. After 3 seconds the LED will turn OFF, after that within 2 seconds, release the tamper key. If successful, the LED will light ON one second. Otherwise, the LED will flash once. 3. IDs are excluded and all settings will reset to factory default.
SmartStart	<ol style="list-style-type: none"> 1. Product has a DSK string , you can key in first five digit to increment SmartStart process,or you can scan QR code. Ex:mydsk 10209-46687-52248-13629-04783-07465-15776-56519 2. SmartStart enabled products can be added into a Z-Wave network by scanning the Z-Wave QR Code present on the product providing SmartStart inclusion. No further action is required and the SmartStart product will be added automatically within 10 minutes of minutes On in the network vicinity. *notice1:The QR code can be found on the device PAT13 or on the box.
Association	<p>This machine provides two groups of nodes. Each group can set 4 Nodes.</p> <p>Group 1: Used for returned events. Report type: <ol style="list-style-type: none"> 1.Notification report 2.Sensor multilevel report 3.Device Reset Locally Notification 4.Battery Report </p>

	Group 2: Used for returned events. Report type: 1.Basic Set
<ul style="list-style-type: none"> Failed or success in add/remove the node ID can be viewed from Z-Wave™ Controller. 	

Notice 1: Always RESET a Z-Wave™ device before trying to add it to a Z-Wave™ network

Z-Wave™ Notification

After the device adding to the network, it will wake-up once per day in default. When it wake-up it will broadcast the "Wake Up Notification" message to the network, and wake-up 10 seconds for receive the setting commands.

The wake-up interval minimum setting is 30 minutes, and maximum setting is 120 hours. And the interval step is 30 minutes.

Press the tamper key once. The device will wake-up 10 seconds.

Z-Wave™ Message Report

When the Door/Window triggered the device will report the trigger event and also report the battery status and temperature.

In default the device will using Notification Report to represent the trigger event.

* Door/Window Report: (PA13-A)

When the Door/Window Open, the device will unsolicited to send the report to the nodes in the lifeline group.

Notification Report (V4)
Notification Type: Access Control(0x06)

Event: Door/Window Open(0x16)

And after the Door/Window Close clear, the device will unsolicited to send the report to the nodes in the lifeline group.

Notification Report (V4)
Notification Type: Access Control(0x06)
Event: Door/Window Close (0x17)

* Tamper Report: (PAT13-A, PAT13-B)

The tamper key pressed over 5 seconds. The device will into the alarm state. In that state, if the tamper key be released, the device will unsolicited to send the report to the nodes in the lifeline group.

Notification Report (V4)
Notification Type: Home Security (0x07)
Event: Tampering. Product covering removed (0x03)

* Temperature Report: (PAT13-A, PAT13-B)

When the Door/Window triggered or the temperature differential over 1 Fahrenheit (in default), the device will unsolicited to send the "Sensor Multilevel Report" to the nodes in the lifeline group.

Sensor Type: Temperature (0x01)

Note: To disable send temperature report after the flood triggered, please setting the configuration NO.5 bit5 to 1.

*** Temperature differential report ***

This function default is enabled, to disable this function by setting the configuration NO.21 to 0.

In the default, when the temperature is changed to plus or minus one degree Fahrenheit (0.56 degree Celsius), the device will report temperature information to the nodes in the lifeline group.

The device will measure the temperature in every 10 seconds. And if

the temperature is over 140 degree Fahrenheit (60 degree Celsius), the device will always report in each measurement.

* **Timing Report:**

Beside the event triggered could report message, the device also support the timing unsolicited report of the status.

- Battery level report: Every 6 hours report once in default. It could be changed by setting the configuration NO. 10.
- Door/Window state report: Every 6 hours report once in default. It could be changed by setting the configuration NO. 11.
- Low battery report: When the battery level is too low, every 30 minutes will report once.
- Temperature report: Every 6 hours report once in default. It could be changed by setting the configuration NO. 13.

Notice: The configuration NO. 10, 11, 13 and 14 could be setting to zero to disable the auto report. And the configuration NO. 20 could change the tick interval, the default value is 30, if setting to 1, that means the minimum auto report interval will be one minute. And please notice if setting this value to zero, that means disable all of the timing report except the low battery detection.

Power Up Procedure

* **Battery Power Check**

When the device power up, the device will detect the power level of the battery immediately. If the power level is too low, the LED will continue flash about 5 seconds. Please change another new battery.

* **Wake**

When the device power on, the device will wake about 20 seconds. In

this duration, the controller can communicate with the device. Normally the device is always sleeping to save the battery energy.

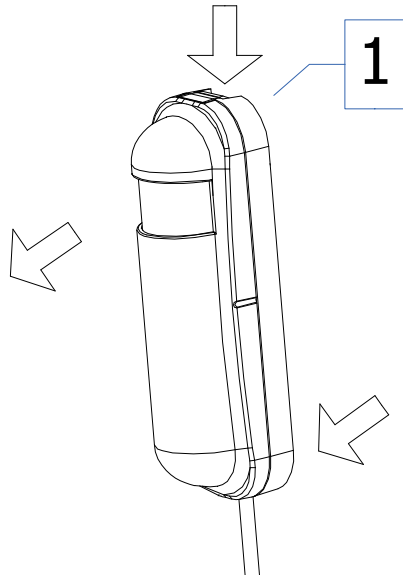
PS: If the device already adding to the network, the device will broadcast a node information once.

Over The Air (OTA) Firmware Update

The device support the Z-Wave firmware update via OTA. Let the controller into the firmware update mode, and then press the tamper key once to start the update. At that time, ***please don't remove the battery***, otherwise it will cause the firmware broken, and the device will no function. After the LED stop flash, it is recommended that the user power up the device. **Caution:** After remove the battery, please wait about 30 seconds, and then re-install the battery.

Battery Installation

When the device report the low battery message. The user should replace the battery to new one. The battery type is CR123A, 3.0V. The way to open the front cover please press the top position, to release the cover.



Replace the new battery and install the cover back.

1. Put the front cover bottom, and press down.
2. Push the front cover top.

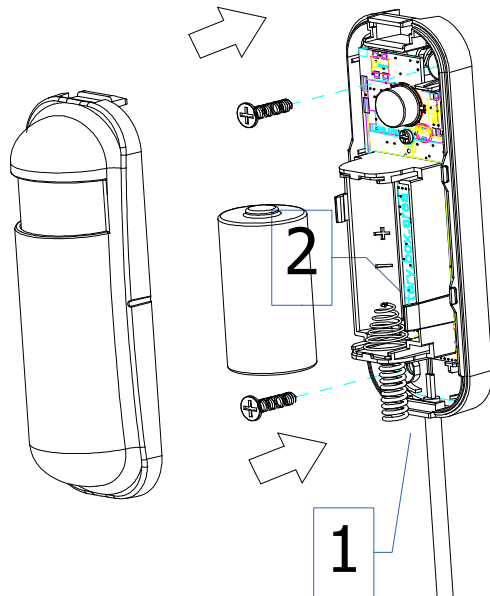
Z-Wave Configuration Settings

Notice:

* All of the configuration, the data size is 1.

* The configuration mark with star(*), means after the remove the setting still keep, don't reset to factory default. Unless the user execute the "RESET" procedure.

* The reserve bit or not supported bit is allowed any value, but no effect.



N O.	Name	Def.	Valid	A	B	Description
1	Basic Set OFF Level	0	All	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Setting the BASIC command value. When the flood trigger off(0x00), send the BASIC CC to the group 2.
2	Basic Set ON Level	0xFF	All	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Setting the BASIC command value. When the flood trigger on(0xFF), send the BASIC CC to the group 2.
5 (*)	Operation Mode		All	0	04	Operation mode. Using bit to control.

N O.	Name	Def.	Valid	A	B	Description
)		0		<input checked="" type="checkbox"/>	<input type="checkbox"/>	Bit0: Reserve.
		0		<input type="checkbox"/>	<input type="checkbox"/>	Bit1: Reserve.
		0		<input type="checkbox"/>	<input type="checkbox"/>	Bit2: Disable the door/window function.
		0		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Bit3: Setting the temperature scale. 0: Fahrenheit, 1:Celsius
		0		<input type="checkbox"/>	<input type="checkbox"/>	Bit4: Reserve.
		0		<input checked="" type="checkbox"/>	<input type="checkbox"/>	Bit5: Disable the temperature report after event triggered. (1:Disable, 0:Enable)
		0		<input type="checkbox"/>	<input type="checkbox"/>	Bit6: Reserve.
		0		<input type="checkbox"/>	<input type="checkbox"/>	Bit7: Reserve.
7 (*)	Customer Function		All	0	0	Customer function switch, using bit control.
		0		<input type="checkbox"/>	<input type="checkbox"/>	Bit0: Reserve.
		0		<input type="checkbox"/>	<input type="checkbox"/>	Bit1: Reserve.
		0		<input type="checkbox"/>	<input type="checkbox"/>	Bit2: Reserve.
		0		<input checked="" type="checkbox"/>	<input type="checkbox"/>	Bit3: Disable send out BASIC OFF after the door/window event cleared. (1:Disable, 0:Enable)
		0		<input type="checkbox"/>	<input type="checkbox"/>	Bit4: Reserve.
		0		<input type="checkbox"/>	<input type="checkbox"/>	Bit5: Reserve.
		0		<input checked="" type="checkbox"/>	<input type="checkbox"/>	Bit6: Disable to report battery state when the device triggered. (1:Disable, 0:Enable)

N O.	Name	Def.	Valid	A	B	Description
		0		<input type="checkbox"/>	<input type="checkbox"/>	Bit7: Reserve.
10	Auto Report Battery Time	12	0 ~ 127	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	The interval time for auto report the battery level. 0 means turn off auto report. The default value is 12. The tick time can setting by the configuration No.20.
11	Auto Report Door/Window State Time	12	0 ~ 127	<input checked="" type="checkbox"/>	<input type="checkbox"/>	The interval time for auto report the door/window state. 0 means turn off auto report door/window state. The default value is 12. The tick time can setting by the configuration No.20.
13	Auto Report Temperature Time	12	0 ~ 127	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	The interval time for auto report the temperature. 0 means turn off auto report. The default value is 12. The tick time can setting by the configuration No.20.
20	Auto Report Tick Interval	30	0 ~ 0xFF	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	The interval time for auto report each tick. Setting this configuration will effect configuration No.10, No.13, No.14 and No.15. Units of one minute. Caution1: <i>Setting to 0 means turn off all auto report function.</i> Caution2: <i>The value is unsigned byte, the range is from 0x00 ~</i>

N O.	Name	Def.	Valid	A	B	Description
						<i>0xFF.</i>
21	Temperature Differential Report	1	0 ~ 127	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	The temperature differential to report. 0 means turn off this function. The unit is Fahrenheit. Enable this function the device will detect every 10 seconds. And when the temperature is over 140 degree Fahrenheit, it will continue report.

Manufacturer Specific	2	Highest granted Security Class
Version	3	Highest granted Security Class
Sensor Multilevel	11	Highest granted Security Class
Wake Up	2	Highest granted Security Class
Association Group Info	1	Highest granted Security Class
Powerlevel	1	Highest granted Security Class
Device Reset Locally	1	Highest granted Security Class
Security 0	1	None
Security 2	1	None
Firmware Update Meta Data	4	Highest granted Security Class
Supervision	1	None
Transport Service	2	None
Basic	1	Highest granted Security Class

Z-Wave Supported Command Class

Command Class	Version	Required Security Class
Z-Wave Plus Info	2	None
Battery	1	Highest granted Security Class
Notification	8	Highest granted Security Class
Association	2	Highest granted Security Class
Configuration	1	Highest granted Security Class

CAUTION

**Risk of explosion if battery is replaced by an incorrect type.
Dispose of used battery according to the instructions.**

Choosing a Suitable Location

1. The suitable ambient temperature for the module/device is 0°C~40°C.
2. Do NOT place the module/device direct under sunlight, in a humid place or in any location where they may contact moisture, dirt, dust.
3. Do NOT place the module/device where exists combustible substances or any source of heat, fires, radiators, boiler etc.

Disposal



This marking indicates that this product should not be disposed with other household wastes throughout the EU. To prevent possible harm to the environment or human health from uncontrolled waste disposal, recycle it responsibly to promote the sustainable reuse of material resources. To return your used device, please use the return and collection systems or contact the retailer where the product was purchased. They can take this product for environmentally safe recycling.

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FCC Interference Statement

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 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.

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.

FCC Caution: Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

Warning

Do not dispose of electrical appliances as unsorted municipal waste, use separate collection facilities. Contact your local government for information regarding the collection systems available. If electrical appliances are disposed of in landfills or dumps, hazardous substances can leak into the groundwater and get into the food chain, damaging your health and well-being.

When replacing old appliances with new once, the retailer is legally obligated to take back your old appliance for disposal at least for free of charge.