Philio PAT14 Z-Wave Ultra Low Temperature Sensor User Manual

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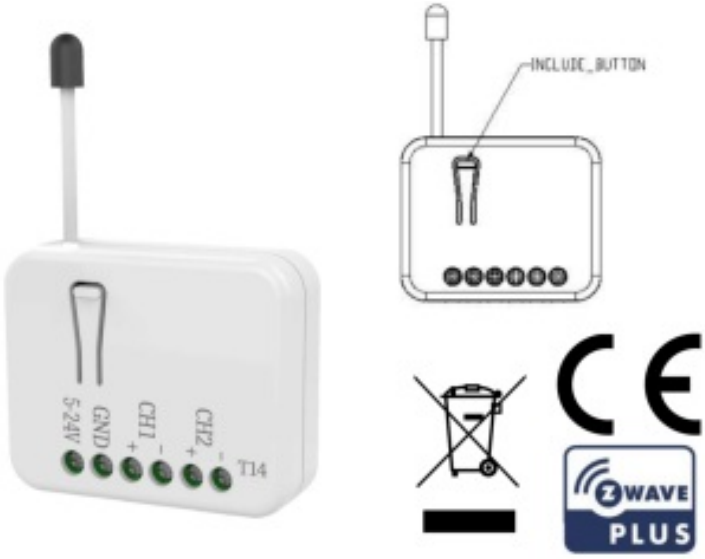
Z-Wave Ultra low temperature sensor PAT14



The Z-Wave Ultra low temperature sensor PAT14 has 2 channel thermocouple , based on Z-Wave™ technology. This device is a security enabled Z-Wave

Plus™ product. The encrypted Z-Wave Plus™ messages support PAT14 to communicate with other Z-Wave Plus™ products. PAT14 can be used with Z-Wave™ devices (with Z-Wave™ logo) from different manufacturers, it can also be included in the Z-Wave™ networks from different manufacturers.

All mains operated nodes (even from different manufacturers) in the network act as repeaters to increase the stability and reliability of the ZWave™ network.

The product is supported with Over-the-Air (OTA) feature for firmware upgrade.

Specification

Rated	DC5-24V 6mA
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	47.5 x 39 x16 mm
Location	Indoor use only
Operation temperature	-10°C – 40°C
Storage Temperature	-20°C – 60°C
Humidity	Up to 85% max
Temperature Detect Range	-250 to 300°C
Sensor type	External K/J/T type thermocouple (depend on the user choice)
FCC ID	RHHPAT14

Specifications are subject to change and improvement without notice.

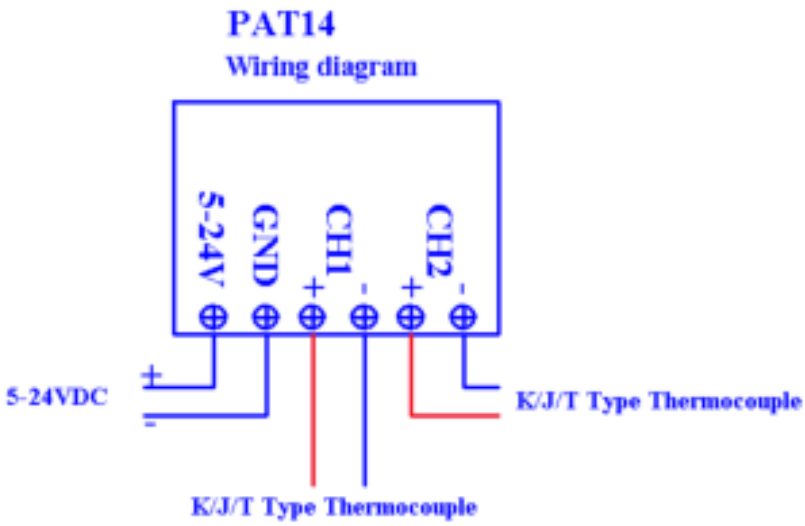
Troubleshooting

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

Installation Steps

1. Connect 5-24V&GND to 5-24VDC.
2. Connect K/J/T Type Thermocouple to CH1/CH2.

***When installing a thermocouple, please pay attention to the positive and negative polarity of the thermocouple. If the installation is wrong, the temperature measurement will be wrong.



For Instruction to http://www.philio-tech.com

Add to/Remove from Z-Wave™ Network

There is a button with LED indicator in front of PAT14. It is used to dim on/off the light and carry out the inclusion, exclusion, reset or association of PAT14 from Z-wave controller.

When the fist power one, the LED indicator flashes once per second for 30 seconds. With the SmartStart function, PAT14 will be automatically included by Z-wave controller.

PAT14 can be operated with any certified Z-Wave™ devices from different manufacturers in Z-Wave™ network. All non-battery operating devices act as repeaters to increase the stability and reliability of the ZWave™ network.

The table below provides an operation summary of basic Z-Wave™ functions. To add/remove/associate PAT14, please refer to the instruction of certified Z-Wave™ Primary Controller.

Function	Description
Without Node ID	New PAT14 does not have Node ID until it is included by a Z-Wave™ Controller.
Add (Classic Inclusion)	1. Set Z-Wave™ Controller to inclusion mode by fol- lowing the instructions provided by t he controller manufacturer. 2. Press the button on PAT14 three times within 3 sec- onds to enter inclusion mode.
SmartStart	1. To initiate the SmartSart process, please type in the first five digits of DSK string or sc an the QR code. The QR Code can be found on PAD15 or in the box. Ex: DSK: 18112-24021-58001-62259-57092- 27453-08187-47408 2. PAT14 is supported with SmartStart, it can be added to Z-Wave™ network by scannin g the Z- Wave™ QR code on the product. 3. Without further actions, PAT14 will be automatically included in a certified Z-Wave™ Controller with SmartStart inclusion ability in 10 minutes after it turned on.
Remove (Exclusion)	1. Set your Z-Wave™ controller to exclusion mode by following the instructions provided by the controller manufacturer. 2. Press the button on PAT14 three times within 3 sec- onds to enter exclusion mode. 3. Node ID will be excluded.
Reset	1. Press the button of PAT14 four times within 3 sec- onds and hold the last press until t he LED light turns off.

- **Adding a node ID allocated by Z-Wave™ Controller means inclusion. Removing a node ID allocated b y Z-Wave™ Controller means exclusion.**
- **The situation of including/excluding of the node ID can be checked from the Z-Wave™ Controller.**
- **Function Reset: The Reset procedure can only be used when PAD15 cannot be recognized by the Z-Wave™ Primary Controller.**

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

LED Light Indication

The LED light indicates the different modes of the PAD15

State Type	LED Indication
Without Node ID	Under normal operation, when the PAD15 has not been allocated a node ID, the LED light will flash on and off alternately at 1-second intervals. By pressing the On/Off butt on, LED light will stop flashing temporarily.
Learning	Flashes when learning is successful

Z-Wave™ Multi Channel Association

PAT14 just be set to send reports to multi channel associated ZWave™ devices. It supports five association groups with five nodes support for group 1 ~ group 5.

Group 1, the will report DEVICE_RESET_LOCALLY_NOTIFICATION.

Group 2, End Point 1 will report (channel 1) SENSOR_MULTILEVEL_REPORT_TEMPERATURE

Group 3, End Point 2 will report (channel 2) SENSOR_MULTILEVEL_REPORT_TEMPERATURE

Group 4, End Point 1 will report (channel 1) NOTIFICATION_REPORT_HEAT_V4

Group 5, End Point 2 will report (channel 2) NOTIFICATION_REPORT_HEAT_V4

Z-Wave™ Notification

This function default is disable, to enable this function by setting the configuration NO.3 bit4~7.And set threshold by setting the configuration NO.11 ~ 14.

Z-Wave™ Message Report

* Temperature differential report:
This function default is enabled, to disable this function by setting the configuration NO.7 to 0.
In the default, when the temperature is changed to plus or minus 0.5 degree Celsius, the device will report temperature information to the nodes in the lifeline group.
The device will measure the temperature in every 1 seconds. And if the temperature is over 140 degree Fahrenheit (60 degree Celsius), the device will always report in each measurement.

*** Timing Report:**

The device support the timing unsolicited report of the status.

- Temperature report: Every 1 hours report once in default.
  It could be changed by setting the configuration NO. 5.

Notice: The configuration NO. 5 could be setting to zero to disable the auto report. And the configuration NO. 6 could change the tick interval, the default value is 12, 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.

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.

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.

NO.	Name	Def.	Valid	Description
1	Operation Mode		All	Bit control.
		0		**Bit0**: reserve.
		0		**Bit1**: reserve.
		0		**Bit2**: reserve.
		1		**Bit3**: Set temperature unit. 0: Fahrenheit 1: Celsius
		0		**Bit4**: CH1 overheat notification 0:disable 1:enable
		0		**Bit5**: CH1 under heat notification 0:disable 1:enable
		0		**Bit6**: CH2 overheat notification 0:disable 1:enable
		0		**Bit7**: CH2under heat notification 0:disable 1:enable
2	Custom Func		All	Bit control.
		01		**Bit0 Bit1**: Set CH1 thermocouple type 00 → disable 01 → K-type 10 → T-type 11 → J-type
		0		**Bit2**: reserve.
		00		**Bit3 Bit4**: Set CH2 thermocouple type 00 → disable 01 → K-type 10 → T-type 11 → J-type
		0		**Bit5**: reserve.
		0		**Bit6**: reserve.
		0		**Bit7**: reserve.
3	Auto Report Temperat ure Time	5	0 ~ 127	Temperaturn auto report time 0 : disable. Default is 5. Tick Interval can setting by configuration No.4.
4	Auto Report Tick Interval	12	0 ~ 0xFF	The interval time for auto report each tick. Setting this configuration will effect configuration No.3. Units of one minute. Caution1: Setting to 0 means turn off all auto report function. Caution2: The value is unsigned byte, the range is from 0x00 ~ 0xFF.
5	Temperat ure Differenti al Report	0	0 ~ 127	The temperature differential to report. 0 means turn off this function. The unit is Celsius. And when the temperature is over 140 degree Fahrenheit, it will continue report.
6	CH1 Temperat ure High threshold	32767	int16	CH1 overheat notification threshold.

7	CH1 Temperat ure Low threshold	-32768	int16	CH1 underheat notification threshold.
8	CH2	32767	int16	CH2 overheat notification threshold.
	Temperat ure Hi gh threshold			
9	CH2 Temperat ure Low threshold	-32768	int16	CH2 underheat notification threshold.

Z-Wave Supported Command Class

Command Class	Version	Required Security Class
Z-Wave Plus Info	2	None
Transport Service	2	None
Security 0	1	None
Security 2	1	None
Supervision	1	None
Version	3	Highest granted Security Class
Configuration	4	Highest granted Security Class
Association	2	Highest granted Security Class
Association Group Info	3	Highest granted Security Class
Notification	8	Highest granted Security Class
Version	3	Highest granted Security Class
Device Reset Locally	1	Highest granted Security Class
Indicator	3	Highest granted Security Class
Powerlevel	1	Highest granted Security Class
Multi Channel	4	Highest granted Security Class
Firmware Update Meta Data	5	Highest granted Security Class
Multilevel Sensor	2	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 -10°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 th roughout 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 s afe 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:

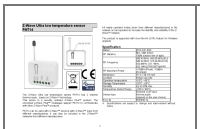
- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

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.

Documents / Resources

	**Philio PAT14 Z-Wave Ultra Low Temperature Sensor** [pdf] User Manual PAT14, Z-Wave Ultra Low Temperature Sensor