Air Quality Multi Sensor PAT05

The PAT05 multi-sensor is a device that allows you to check the air quality in your home, as well as detect temperature and humidity. The PAT05 Multi-sensor is easy to use and very convenient for your home. Just set the sensor on the wall of the rooms you would like to control, and you are ready to go. Moreover, the PAT05 can be integrated to other Z-Wave certified devices, and controlled with Philio app “Home Mate 2.” You can now protect your family and make sure there are no gas leaks or moisture that can harm those you love the most. Set up your PAT05 to send regular notifications and take control even when not at home.

This device is a security enabled Z-Wave Plus product that is able to use encrypted Z-Wave Plus messages to communicate to other security enabled Z-Wave Plus products. Z-WaveTM enabled devices displaying the Z-WaveTM logo can also be used with it regardless of the manufacturer, and ours can also be used in other manufacturer’s Z-WaveTM enabled networks.

The product supports Over The Air(OTA) feature for the products firmware upgrade.

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.

Notice:

Once you have completed the setup process, Please allow for a 7-Day settling period for the sensors to adjust to their new environment and to observe a typical cycle of air quality, based on your activity within a 1 week period.

Add to/Remove from Z-Wave™ Network

There are two tamper keys in the device, one is in the back side, another is in the front side. Both of them can add, remove, reset or association from Z-Wave™ network.

The table below lists an operation summary of basic Z-Wave functions. Please refer to the instructions for your Z-WaveTM Certificated Primary Controller to access the Setup function, and to Add/Remove/associate devices

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 (Inclusion)	1. Have Z-Wave™ Controller entered inclusion mode.

	2. Pressing tamper key three times within 2 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 (Exclusion)	1. Have Z-Wave™ Controller entered exclusion mode. 2. Pressing tamper key three times within 2 seconds to enter the exclusion mode. Node ID has been excluded.
Reset	1. Pressing Include button of PAT05 three times within 2 seconds will enter inclusion mode. 2. Within 1 second, press Include button of PAT05 again for 5 seconds.
SmartStart	1. Product has a DSK string, you can key in first five digit to increment smart start process, or you can scan QR code. 2. 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 of being switched on in the network vicinity.
Association	1. The PAT05 is an always listening Z-Wave device, so associations may be added or removed by a controller at any time. Or If your controller requires to have the PAT05 send a 'node information frame' or NIF for associations, then pressing the On/Off button three times within 2 seconds will cause the PAT05 to send its NIF.
※Adding a node ID allocated by Z-Wave Controller means inclusion. Removing a node ID allocated by Z-Wave Controller means exclusion. ※Failed or success in including/excluding the node ID can be viewed from the Z-Wave Controller.	

Z-Wave™ Message Report

***** eCO2 **Report:**

When the eCO2 detected state changed, the device will unsolicited to send the "Sensor Multilevel Report" to the nodes in the group 1.

Sensor Type: eCO2 (0x11)

*** eCO2 Differential percent Report***

This function default is enabled, to disable this function by setting the configuration NO.17 to 0.

In the default, when the eCO2 is changed to percentage, the device will report eCO2 information to the nodes in the group 1.

Caution 1: *If the configuration No.3, No.4, No.5, No.6 and No.7 is setting to 0 this functionality is useless.*

***** TVOC **Report:**

When the TVOC detected state changed, the device will unsolicited to send the "Sensor Multilevel Report" to the nodes in the group 1.

Sensor Type: TVOC (0x27)

*** TVOC Differential percent Report ***

This function default is enabled, to disable this function by setting the configuration NO.18 to 0.

In the default, when the TVOC is changed to percentage, the device will report TVOC information to the nodes in the group 1.

Caution 1: *If the configuration No.8, No.9, No.10, No.11 and No.12 is setting to 0 or 100, this functionality is useless.*

*** Timing Report:**

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

- eCO2 report: Every 3 minute report once in default.
  It could be changed by setting the configuration NO. 14.
- TVOC report: Every 6 hours report once in default.
  It could be changed by setting the configuration NO. 15.

Notice: The configuration NO. 14 and 15 could be setting to zero to disable the auto report. And the configuration NO. 16 could change the tick interval, the default value is 3, if setting to 1, that means the minimum auto report interval will be one minute.

Security Network

The device support the security function. When the device included with a security controller, the device will auto switch to the security mode. In the security mode, the follow commands need using Security CC wrapped to communicate, otherwise it will not response.

COMMAND_CLASS_VERSION_V3
COMMAND_CLASS_MANUFACTURER_SPECIFIC_V2
COMMAND_CLASS_DEVICE_RESET_LOCALLY
COMMAND_CLASS_ASSOCIATION_V2
COMMAND_CLASS_ASSOCIATION_GRP_INFO
COMMAND_CLASS_POWERLEVEL
COMMAND_CLASS_CONFIGURATION
COMMAND_CLASS_NOTIFICATION_V8
COMMAND_CLASS_FIRMWARE_UPDATE_MD_V4
COMMAND_CLASS_SENSOR_MULTILEVEL_V11

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
3	eCO2 Threshold line 1	6	1 ~ 100	eCO2 difference return: The Unit is 100ppm. 0 means turn off eCO2 detected function.
4	eCO2 Threshold line 2	8	1 ~ 100	eCO2 difference return: The Unit is 100ppm. 0 means turn off eCO2 detected function.
5	eCO2 Threshold line 3	10	1 ~ 100	eCO2 difference return: The Unit is 100ppm. 0 means turn off eCO2 detected function.
6	eCO2 Threshold line 4	16	1 ~ 100	eCO2 difference return: The Unit is 100ppm. 0 means turn off eCO2 detected function.
7	eCO2 Threshold line 5	30	1 ~ 100	eCO2 difference return: The Unit is 100ppm. 0 means turn off eCO2 detected function.
8	TVOC Threshold line 1	1	1 ~ 100	TVOC difference return: The Unit is 100ppb. 0 means turn off TVOC detected function.
9	TVOC Threshold line 2	2	1 ~ 100	TVOC difference return: The Unit is 100ppb. 0 means turn off TVOC detected function.
10	TVOC Threshold line 3	6	1 ~ 100	TVOC difference return: The Unit is 100ppb. 0 means turn off TVOC detected function.
11	TVOC Threshold line 4	22	1 ~ 100	TVOC difference return: The Unit is 100ppb. 0 means turn off TVOC detected function.
12	TVOC Threshold line 5	55	1 ~ 100	TVOC difference return: The Unit is 100ppb. 0 means turn off TVOC detected function.
13 (*)	Customer Function	1	All	Customer function switch, using bit control. Caution: The value is unsigned byte, the range is from 0x00 ~ 0xFF.
		1		**Bit0**: Tamper On/Off (1:On, 0:Off)
		0		**Bit1**: Reserve.
		0		**Bit2**: Reserve.
		0		**Bit3**: Reserve.
		0		**Bit4**: Reserve.
		0		**Bit5**: Reserve.
		0		**Bit6**: Reserve.
		0		**Bit7:** Reserve.
14	ECO2 Auto Report Time	1	0 ~ 127	The interval time for auto report the eCO2. 0 means turn off auto report battery. The default value is 1. The tick time can setting by the configuration No.16.
15	TVOC Auto Report Time	1	0 ~ 127	The interval time for auto report the TVOC. 0 means turn off auto report illumination. The default value is 1. The tick time can setting by the configuration No.16.
16	Auto Report Tick Interval	3	0 ~ 0xFF	The interval time for auto report each tick. Setting this configuration will effect configuration No.14 and No.15. The unit is 1 minute. Caution1: Setting to 0 means turn off all auto report function. Caution2: The value is unsigned byte, the range is from 0x00 ~ 0xFF.
17	eCO2	10	1~100%	The eCO2 Differential to report.

NO.	Name	Def.	Valid	Description
	Differential percent Report			0 means turn off this function. The unit is percentage. Enable this function the device will detect every percentage. And when the lightSensor is over 10 percentage, it will continue report.
18	TVOC Differential percent Report	10	1~100%	The TVOC Differential to report. 0 means turn off this function. The unit is percentage. Enable this function the device will detect every percentage. And when the lightSensor is over 10 percentage, it will continue report.

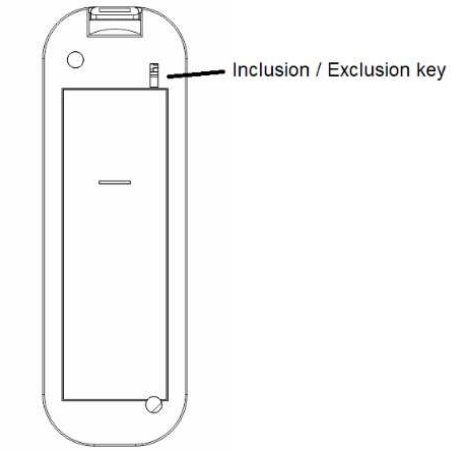
Z-Wave Supported Command Class

Command Class	Version	Required Security Class
Z-Wave Plus Info	2	None
Version	3	Highest granted Security Class
Manufacturer Specific	2	Highest granted Security Class
Security 2	1	None
Device Reset Locally	1	Highest granted Security Class
Association	2	Highest granted Security Class
Association Group Information	1	Highest granted Security Class
Powerlevel	1	Highest granted Security Class
Basic	1	Highest granted Security Class
Configuration	1	Highest granted Security Class
Notification	8	Highest granted Security Class
Firmware Update Meta Data	4	Highest granted Security Class
Supervision	1	None
Transport Service	2	None
Sensor multilevel	11	Highest granted Security Class

Over The Air (OTA) Firmware Update

The device supports Z-Wave firmware update via OTA.
Before starting the update, please remove the front case of the device otherwise the hardware check will fail.
Let the controller into firmware update mode, and press the front tamper key once to start the update.
After firmware download is completed, the LED light will flash intermittently.

Overview



Specifications

Rated Voltage	DC5V from USB
Range	Minimum 40M in door and 100M in outdoor line of sight
Operating Temperature	-10°C ~ 40°C (85% humidity)
Storage Temperature	-20 C ~ 60°C
Location	Indoor use only
Dimension	65(L) x 44.1 (W) x 56.3 (H) mm
TVOC	0-60000ppb
eCO2	400-60000ppm (estimates carbon dioxide level (eCO2))
Frequency Range	868.40MHz; 869.85MHz (EU) 908.40MHz; 916.00MHz (USA/Canada) 916MHz (Israel)
RF Maximum Power (peak)	+5dBm (peak) for EU RED directive
RF Maximum Power (Average)	-10dBm (Average) for EU RED directive
RF Modulation Type	FSK (Frequency-Shift Keying)
FCC ID	RHHPAT05

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 environmental 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.