Quick start
iSensor US

Technical specs

Normal operating voltage	2x AA 1,5V batteries
Frequency range	908.42 MHz
Wireless Range	Up to 30 meters in line of sight
Temperature sensor accuracy	+/- 2,5° C from -55° C to +130° C
Motion sensor range	Max. 10 meters under a 110° angle

Movement Sensor

Light and temperature sensor

Indicator LED
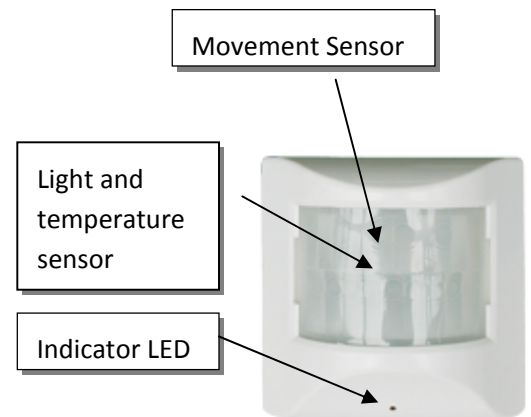
Basic Operations

- The iSensor can detect movement, measure light intensity and temperature.
- The iSensor can trigger a security system.

Mounting

1. Use a flat screwdriver at the inlets on the sides to gently unlock the back cover.
2. Use the designated holes on the back cover to screw mount the iSensor.
   For optimal use, mount the iSensor between 1,8 m and 2,4m above ground
   (A rotating bracket is available to adjust the direction the iSensor is pointing to).
3. Place two AA 1,5V batteries into the device.
4. Mount the iSensor onto the back cover and be sure to close it on all sides and that the tamper gets through the back cover of the iSensor (indication mode: Tamper pressed/released).
5. After 3 seconds startup routine begins (indication mode: Ready for learn mode).
6. After 5 more seconds (8 seconds in total) mounting is completed. (indication mode: Mounting successful)
7. the iSensor has to start up for 10 seconds.
8. After 10 seconds the iSensor is ready for detection.

Include or exclude in Z-Wave network

1. Make sure your Z-Wave controller is in the right operation mode (include or exclude).
2. When the iSensor is mounted, remove it from the back cover as explained in step one of the Mounting instructions.
3. Press and hold the tamper for 1 second (indication mode: Ready for learn mode). Now release the tamper switch to start the inclusion or exclusion process (indication mode: Learn in progress).
4. (The product will start NWI automatically after unsuccessful normal inclusion)

Indication mode

The indicator light gives various statuses of the device as follows:

1. Ready for learn mode: indicator light blinks every second.
2. Learn in progress (add):   indicator light 2 times every second.
3. Learn in progress (remove):   indicator light 3 times every second.
4. Learn mode success: indicator light is on for one second.
5. Learn mode failed: indicator light blinks 8 times rapidly.
6. Tamper pressed/released   indicator light blinks 3 times rapidly.
7. Mounting successful   indicator light is on for 1 second.
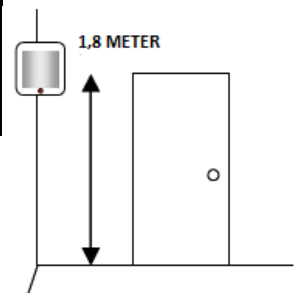
Technical Manual

Caution:
- **This device is using a radio signal that passes through walls, windows and doors. The range is strongly influenced by local conditions such as large metal objects, house wiring, concrete, furniture, refrigerators, microwaves and similar items. On average, the indoor range is approximately 30 meters.**
- **Do not expose this product to excessive heat or moisture.**
- **Prevent long term exposure to direct sunlight.**
- **Do not attempt to repair this product. If the product is damaged or if you are in doubt about the proper operation, take the product back to the place of purchase.**
- **Do not clean the product with any liquid.**

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Normal operating voltage	2x AA 1,5V batteries From 2,3 to 4,0V do not use rechargeable batteries
Frequency range	908.42 MHz
Wireless Range	Up to 30 meters in line of sight
Temperature sensor accuracy	+/- 2,5° C from -55° C to +130° C
Motion sensor range	Max. 10 meters under a 110° angle
Storage temperature	-5°C to +65°C
Storage humidity	10% to 70%
Operating temperature	0°C to 50°C
Operating humidity:	30% to 80%

Detailed instruction

We advise the *iSensor* to be mounted between 1,8m and 2,4m from the ground, flat on the wall and not facing down. With an optional bracket, the direction the iSensor is points at can be changed (up/down and left/right). The iSensor detects movement up to 10 meters. Without bracket attached, it is recommended to place the iSensor in the middle of the wall (see 'Good sensor positioning').
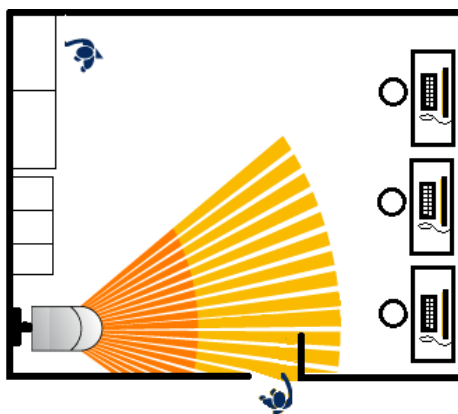
Bad sensor positioning (poor area coverage)
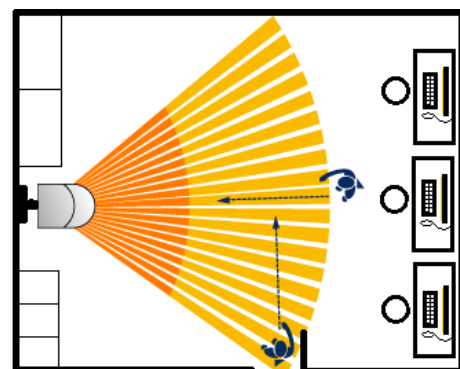
Good sensor positioning

Technical details

Supporting Command Classes

Basic type: BASIC_TYPE_ROUTING_SLAVE
Generic type: GENERIC_TYPE_SENSOR_BINARY
Specific type: SPECIFIC_TYPE_NOT_USED
Listening: False, Z-Wave Lib: 4.51

class: 0x30 COMMAND_CLASS_SENSOR_BINARY
class: 0x31 COMMAND_CLASS_SENSOR_MULTILEVEL
class: 0x60 COMMAND_CLASS_MULTI_CHANNEL_V2
class: 0x70 COMMAND_CLASS_CONFIGURATION
class: 0x71 COMMAND_CLASS_ALARM
class: 0x72 COMMAND_CLASS_MANUFACTURER_SPECIFIC
class: 0x80 COMMAND_CLASS_BATTERY
class: 0x84 COMMAND_CLASS_WAKE_UP
class: 0x85 COMMAND_CLASS_ASSOCIATION
class: 0x86 COMMAND_CLASS_VERSION
class: 0xEF COMMAND_CLASS_MARK
class: 0x20 COMMAND_CLASS_BASIC

Not listening Routing SLAVE
This Z-Wave product will be used as routing slave. Slave nodes are nodes in a Z-Wave network that receive commands and perform actions based on the command. This device will always be in sleep mode because it works on batteries. In sleep mode the device is not active listening, the device will wake up according to the wakeup command class.

Include Initiator
The include initiator is used when Primary and Inclusion Controllers include nodes into the network. When both the include initiator have been activated simultaneously the new node will be included to the network (if the node was not included previously).

Exclude Initiator
The exclude initiator is used by Primary Controllers to exclude nodes from the network. When the exclude initiator and a slave initiator are activated simultaneously, it will result in the slave being excluded from the network (and reset to Node ID zero). Even if the slave was not part of the network it will still be reset by this action.

Z-Wave compatibility
Because this is a Z-Wave device, it means it can co-operate with other Z-Wave devices of other manufacturers. It can co-exist in a Z-Wave network existing with product from other manufacturers.

Hops & Retries
The Z-Wave range has a range of up to 30 meters in line of sight. This signal is not limited to the 30 meter range due to routing the Z-Wave message to other nodes in the network. This way the range of the Z-Wave network can be expanded to 150 meters indoors (limit of 4 hops).

Version 0.31

class 0x20 COMMAND_CLASS_BASIC

When a movement is detected a basic set frame with value 255 is sent to the associated nodes. If the configured time is done with no movement is detected a basic set frame with value 0 is sent to the associated nodes. This is the controlling role of the basic command class.

The supporting role of the basic command class is mapped to the sensor binary command class.

class: 0x30 COMMAND_CLASS_SENSOR_BINARY

The Sensor Binary Command Class can be used to check if motion is detected, value 0 means that there is no motion detected and therefore a associated node is off, value 255 means that a associated node is on.

Class: 0x80 COMMAND_CLASS_BATTERY

This class is used to request and report battery levels for a given device.
When battery level is lower then 20% the iSensor will send a battery warning (value 255) after every wake up notification. A battery get will report the actual value even if below 20 %

class: 0x86 COMMAND_CLASS_VERSION

This Command Class is used to obtain information about the iSensor. The Z-Wave library type, the Z-Wave protocol version and the application version will be reported.

class: 0x72 COMMAND_CLASS_MANUFACTURER_SPECIFIC

This will report information about the manufacturer. This product will contain the manufacturer ID of *Wintop*. Manufacturer ID of *Wintop* is 0x97, the ID of this product is 0x80.

class: 0x70 COMMAND_CLASS_CONFIGURATION

Configure parameters:

0. **Not used**
1. **Set to default**

Description:	Set all config values to default values (factory settings). Read more in chapter configuration Reset.
Size:	1 byte*
Param1:	if 0xFF then set to default
Param2,3,4:	not used

2. **Mode timeout**

Description:	The time used in mode 2 to turn the sensor off. This Time will start running as soon as detection is seen.
Default value:	0x0384 = 900 sec = 15 min
Size:	2 bytes (integer)*
Param1:	the most significant byte of the integer
Param2:	the least significant byte of the integer
Param3,4:	not used

3. **Switch off time**

Description:	The switch off time will start running as soon as mode timeout is done.

		Motion sensor is turned on and when movement is detected again the mode timeout (cfg param 1) will start running all over again.
		When switch off time is done a basic off message is sent to the associated node.
	Default value:	0x0A8C = 2700 sec = 45 min.
	Size:	2 bytes (integer)*
	Param1:	the most significant byte of the integer
	Param2:	the least significant byte of the integer
	Param3,4:	not used

4. **Sensitivity**
	Description:	the sensitivity of the motion circuit
	Default:	0x50 = 80
	Size:	1 byte*
	Param1:	Sensitivity value between 0 and 127 (values above 127 will be reported as the set value but will be handled in SW as 127).
		0 is least sensitive and 127 is most sensitive.
	Param2,3,4:	not used

5. **the mode**
	Description:	The mode that is entered after detection
	Default:	0x02
	Size:	1 byte*
	Param1:	mode 1, 2 or 3.
		Mode 1: no detection possible. Battery save mode
		Mode 2: normal operation mode: send on after detection and off after given time no detection.
		Mode 3: Z-Wave chip is always on to request e.g. version or manufacturer id.
		If mode is 0 or higher then 3, that value will be reported after a get but will be handled in SW as mode 2.
	Param2,3:	not used.

6. **The temperature offset**
	Description:	A offset for the temperature.
	Default:	0x00
	Size:	2 bytes*
	Param1,2:	A signed integer to determine the offset off the temperature.
	Param3,4:	not used.

* if a size is other then given size the frame is ignored totally so configuration values are **not** changed

class: 0x31 COMMAND_CLASS_SENSOR_MULTILEVEL

Sensor_multilevel_get

The Sensor Multilevel Command Class is used to get a report from the iSensor. The returned value is the measured temperatue inside the housing with 2 decimals.

class: 0x60 COMMAND_CLASS_MULTI_CHANNEL_V2

Request temperature

Channel 1

Note: The returned value is the measured temperature (+/- offset) inside the housing with 2 decimals.

Request light / lux

Channel 2

Note: The returned value is the measured LDR resistance in %.

class: 0x85 COMMAND_CLASS_ASSOCIATION

The Association Command Class is used to associate other devices with the iSensor. The devices that are associated can be controlled on application level.

The iSensor can be associated into a grouping. If so, the iSensor can control another Z-Wave device.

Number of groupings: 1

Maximum supported nodes per group: 5

Because only one group is supported grouping identifier is ignored in all cases.

class: 0x84 COMMAND_CLASS_WAKE_UP

The Wake Up Command Class is used at battery-operated devices. This class allows the iSensor to wake up occasionally to notify others devices, that the iSensor is ready to receive commands. After receiving the commands the iSensor will go into sleep mode again. The wake up interval can be set using the WAKE_UP_INTERVAL_SET command.

The default value is 0x1C20 = 7200 sec = 2 hour

The default node is 0xFF = 255 (broadcast)

It is possible to send a **wake up notification** on user interaction. To do this press and hold the tamper switch for 8 seconds.

When the wake up time is set to 0 a **wake up notification** is never send periodically, only on user interaction.

class: 0x71 COMMAND_CLASS_ALARM

This command class is used to identify the state of the tamper alarm. The device will send an unsolicited report to the controller if the status is changed, the value 0x00 will indicate that the tamper is placed correctly on the wall. The value 0xFF will indicate a tamper alarm.

There is 1 alarm type:

3: Tamper switch

Every other alarm type that is requested will be ignored by application.

Configuration Reset

The iSensor Supports a configuration reset function. Configuration reset means
- All configuration values are defaulted.
- Wake up interval is defaulted.

Note: All configurations will also be defaulted after exclusion the device.

This function can be activated by sending a configuration set frame:

CONFIGURATION_SET
Parameter: 0x01
Size: 0x01 (can't be different from 1)
Value: 0xFF (can be any value except for 0x55 or 0xAA)

When the value of configuration value is requested 2 possible values can be returned

CONFIGURATION_REPORT
Parameter: 0x01
Value 0x55:   Device doesn't have all his configuration settings anymore.
                 Even when a configuration parameter is changed back to the default value
Value 0xAA: Devices still has all his factory settings.
                 This are only configuration parameters, wake up interval can be changed.

Always awake mode

The always awake mode is used to request different values from the device e.g. version and manufacturer specific.

The always awake mode can be activated by:

CONFIGURATION_SET
Parameter: 0x05
Size: 0x01 (can't be different from 1)
Value: 0x03 (mode 3)

The always awake mode can be deactivated by:

CONFIGURATION_SET
Parameter: 0x05
Size: 0x01 (can't be different from 1)
Value: Any value except 3

A second option to deactivate mode 3 is
1. Remove batteries.
2. Wait ca 10 seconds.
3. Replace batteries

Note: in always awake mode the batteries will be drain very fast, we do not recommend to use this mode.

Troubleshooting

Frequently Asked Questions

Q: I can't have my iSensor included into my Z-Wave network, what am I doing wrong?
A: **1**. Is the controller ready to include any device into the Z-Wave network? If the controller is not in
          Include or exclude mode, the iSensor can not be included or excluded.
          2. The iSensor is already included in a Z-Wave network. Exclude the iSensor and
          Try to include it again.

Q: Why doesn't the iSensor detect any movement?
A: **1**. The iSensor isn't included in a Z-Wave network. Include it and try it again.
          2. The batteries are almost empty, try putting new ones in.

Q: The temperature report of the iSensor is incorrect.
A: **1**. The iSensor is placed directly in the sun, which makes the temperature in the housing of the iSensor
          hotter than elsewhere in the room.
          2. The calibration is not the same as your other temperature sensor, it is possible to do a re-calibration
          of the temperature sensor with Vera or other gateway.

Q: I have configured a value but when I request it, it is not changed?
A: It is mandatory that the correct size is used while configure a parameter; go to the documentation about
the configuration command class to check if the right size is used during configuration. If the wrong size is used
the frame is ignored totally.

Q: I have configured a new value and when I request it the correct value is returned but the behavior is still the
same?
A: Some configuration parameters have limits of what they can do, go to the documentation about
configuration to check if the value of the configured parameter is out off limit.

Q: When I mount the iSensor it performs its standard mounting routine but after 8 seconds the indicator light
doesn't go on for 1 second but blinks 6 times.
A: blinking 6 times can mean:
   1. iSensor is   not included
   2. iSensor is   not associated
   3. iSensor can't reached his   destination
If all three options are corrected, iSensor is will operate correctly and can be mounted again.

Q: When I exclude the iSensor the configuration times ar e reset back to default.
A: That is correct when the iSensor is excluded all configurations including wake up timings are reset back to
default. You will need to configure the device again after included into the controller.
By forcing the tamper switch a wake up message (broadcast) will be send to easily change the configuration.

FCC statement:

This device complies with Part 15 of the FCC Rules. Its 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.

Note: This product 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 product 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 product 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.

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